

Conversation with California Forum and Journal Index to Comments

This document is an index of all comments submitted to the Conversation with California Journal (June 2007 through August 2007) and Forum (September 2007 through November 2007). Each comment was submitted in one of the four challenge areas below. From these comments, the Emerging Options Document was compiled which served as a basis for the development of the Green Chemistry Phase 1 Option Report. The intent of this document is to cross reference applicable journal and forum comments to the Report.

These options are organized into four groups known as challenge areas:

- (1) Cradle to Cradle: Moving Towards a Cradle to Cradle Framework
- (2) Green Chemistry: Stimulating Green Chemistry
- (3) Toxics by Design: Identifying Toxics in Products by Design
- (4) Toxics by Accident: Identifying Toxics in Products by Accident

Each option presented in this Record falls into one or more of the categories defined below:

Category		Types of Options Included (Definition)
Data Collection and Use (Information)	D	Identify and address information gaps; obtain and use better data. Establish mechanisms to expand and share information (about chemicals, toxicity, hazards, risks, life-cycle assessments, etc.). Develop a "chemical map of
Economic Incentives and Markets	I	Use market forces (incentives and disincentives). Encourage corporate responsibility and accountability. Establish funding mechanisms.
Statutory and Regulatory Requirements, Enforcement	S	Establish and harmonize laws and regulatory requirements; require disclosure, reporting, testing, or standards; prohibit uses or ban harmful chemicals; use or expand compliance and enforcement (regulatory system). More specifically, assess risks or hazards via a pre-market evaluation; consider life-cycle of a product; establish metrics to determine effectiveness of risk or hazard reduction strategies. Reduce or restrict use through reduction measures, standards, process or engineering changes, and product stewardship.
Voluntary Measures	V	Develop chemical data, reduce use, and find safer substitutes through voluntary measures. Encourage public-private partnerships. Identify and use non-regulatory models to stimulate green chemistry.
Education and Outreach	E	Increase public awareness. Enhance curriculum and academia programs. Provide clear and meaningful information to consumers. Foster training and workforce development in green chemistry.
Research and Technology	R	Conduct research on chemicals (risks and hazards), analytical methods, chemical designs and processes, and safer alternatives. Support increased research and development of green chemistry technologies establish laboratories and technical centers.
Technical Assistance	T	Provide technical assistance to businesses. Establish networks (between government, industry, academia, and the public) to promote green chemistry tools. Publish guidelines and methodologies.
Recognition, Awards, and Certification	A	Establish certification programs (for products, processes, and businesses). Recognize and award worthy achievements. Encourage innovation and change through preferred purchasing.

CRADLE TO CRADLE

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)							
F-C2C-1	Catherine T. (Katie) Hunt, President		19-Nov-07	American Chemical Society Response		I	S					
F-C2C-2	Archie J. Beaton	Chlorine Free Products Assn.	19-Nov-07	Based Tools to Certify "Green" Cleaning	D		S					
F-C2C-3	Alastair Iles	Alastair Iles, UC Berkeley	16-Nov-07	Biomass chemistry							R	
F-C2C-4	Trudy Fisher		16-Nov-07	Comments - California Green Chemistry Initiative								
F-C2C-5	Leslie Tamminen		16-Nov-07	Education and the Environment Initiative			S		E			
F-C2C-6	RV Parks and Campgrounds		16-Nov-07	CalARVC's Comments			S					
F-C2C-7	Johnson & Johnson		16-Nov-07	Johnson & Johnson - Additional Comments		I	S	V	E	R		
F-C2C-8	Frank Teng		16-Nov-07	by Silicon Valley Leadership Group	D	I		V	E	R	T	A
F-C2C-9	Western States Petroleum Association		16-Nov-07	the California Green Chemistry Initiative								
F-C2C-10	Walter M. McClelland		16-Nov-07	Concerned About Safety of Products			S					
F-C2C-11	Diane Brodd		16-Nov-07	Chemistry Initiative - Comments			S					
F-C2C-12	Linda Blackwell		16-Nov-07	California Green Chemistry Initiative			S					
F-C2C-13	Andrew Hackman		16-Nov-07	Comments on the California Green	D	I	S	V	E	R		A
F-C2C-14	Mike Walls		16-Nov-07	the "Conversation with California"	D	I	S	V	E	R	T	A

CRADLE TO CRADLE

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)							
F-C2C-15	Mike Walls		16-Nov-07	Actions Related to California Green	D	I	S		E	R		
F-C2C-16	Veronique Steukers		16-Nov-07	Feedback from Albemarle Europe	D							
F-C2C-17	Paul Noe		16-Nov-07	Industries on California Green Chemistry Initiative								
F-C2C-18	Lorraine Larsen-Hallock		16-Nov-07	tools to implement the Green Chemistry Initiative	D						T	
F-C2C-19	Fareed Ferhut		16-Nov-07	Extended Producer Responsibility								
F-C2C-20	Ray Dawson		16-Nov-07	Feedback from Albemarle Corporation				V				A
F-C2C-21	Paul No		16-Nov-07	Framework for Green Chemistry	D	I	S	V	E	R	T	A
F-C2C-22	J. Reed		16-Nov-07	the Green Chemistry Symposium III			S	V		R		A
F-C2C-23	Bayer MaterialScience LLC		15-Nov-07	Comments on California Green Chemistry Initiative	D	I	S	V		R		
F-C2C-24	Philip G. Lewis, M.D., M.P.H.		15-Nov-07	Comments from Rohm and Haas Company								
F-C2C-25	Pat Hayes		15-Nov-07	for Advancing California's Green Chemistry Initiative	D	I	S		E	R		A
F-C2C-26	Andy Peri		15-Nov-07	Green Chemistry Initiative Public Comments								
F-C2C-27	Paul DeLeo	The Soap and Detergent Association	15-Nov-07	Beyond: Sustainability, Safety and Continual	D	I	S		E	R	T	A
F-C2C-28	Ray Paulson, P.E.	Fleet Readiness Center Southwest North Island	14-Nov-07	Feedback - California Green Chemistry Initiative	D		S		E			

CRADLE TO CRADLE

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)								
F-C2C-29	George R. Thompson, Ph.D., President, CCS		14-Nov-07	Green Chemistry Initiative Workable	D		S	V				T	
F-C2C-30	George Kopcsak		14-Nov-07	Measuring the Greenness of Products	D		S						
F-C2C-31	Dow Chemical Company		13-Nov-07	Comments on Chemical Management Systems	D		S	V					
F-C2C-32	Environmental Forum (BSEF)		13-Nov-07	BSEF's Chemical Policy Recommendations			S	V					
F-C2C-33	Kevin Lyons		12-Nov-07	Assessment of "Green" Chemicals, Products and	D		S	V					A
F-C2C-34	Dow Chemical Company		9-Nov-07	Comments on Educational Programs									
F-C2C-35	Andrew Hackman	Consumer Specialty Products Assoc	6-Nov-07	Framework for Green Chemistry						E			
F-C2C-36	Mike Walls	American Chemistry Council	3-Nov-07	Stimulating Green Chemistry	D	I				E	R	T	A
F-C2C-37	California Medical Association		2-Nov-07	A Modern Chemicals Policy For California									
F-C2C-38	Karen Oxenbøll		2-Nov-07	Novozymes Green Chemistry Thoughts	D								
F-C2C-39	jesse goldstien		3-Nov-07	conversion via enzymatic oxidation									
F-C2C-40	Sue Tracy		5-Nov-07	Options for Cradle to Cradle, Today		I					R		
F-C2C-41	Kimberly Schulz	Enviro. Health & Resource Center	1-Nov-07	Check out This Tool that Will Work!!!	D		S						
F-C2C-42	DTSC Regional Office Berkeley		5-Oct-07	Behalf of DTSC Regional Office Berkeley		I	S			E	R		A

CRADLE TO CRADLE

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)							
F-C2C-43	John M. Batt	Airgas, Inc.	30-Oct-07	Innovation and Environmentally Friendly								
F-C2C-44	Mike Walls	American Chemistry Council	29-Oct-07	Thoughts About Substitution			S	V	E			
F-C2C-45	CHANGE		29-Oct-07	CHANGE's Perspective on a Successful Program	D	I	S	V	E	R	T	A
F-C2C-46	Dow Chemical Company		29-Oct-07	Dow Chemical's Green Chemistry Thoughts	D	I			E	R		
F-C2C-47	Richard Denison	Environmental Defense	25-Oct-07	Chemistry Council's comments	D			V	E			
F-C2C-48	Richard Denison	Environmental Defense	25-Oct-07	California can do to start advancing chemicals	D		S		E	R		
F-C2C-49	Richard Denison	Environmental Defense	25-Oct-07	Approaches to Chemical Prioritization	D							
F-C2C-50	Glenn Johnston		24-Oct-07	Director Regulatory Affairs								
F-C2C-51	jesse goldstien		24-Oct-07	super cool...i'd like that for my product								
F-C2C-52	Cayce Warf		22-Oct-07	Director, Environmental Sustainability Programs			S					
F-C2C-53	Mike Walls	American Chemistry Council	19-Oct-07	the One Approach that Makes Sense	D		S					
F-C2C-54	Wayne Brooks		25-Oct-07	working as a Chemical Engineer		I						
F-C2C-55	J. C. King		19-Oct-07	of "Green" Munitions and Chemicals of Concern	D		S					
F-C2C-56	Mike Walls	American Chemistry Council	15-Oct-07	Addressing the Data Gaps	D							

Green Chemistry

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)						
F-GC-1	Catherine T. (Katie) Hunt, President		19-Nov-07	American Chemical Society Response		I	S			R	
F-GC-2	Archie J. Beaton	Chlorine Free Products Assn.	19-Nov-07	Use of Existing Web-Based Tools to Certify "Green" Cleaning Products	D		S				
F-GC-3	Nora Songcayauon - ED	Asian Service Organization	16-Nov-07	Green Chemsitry & Low Income Community			S				
F-GC-4	Andrew Ysiano		16-Nov-07	AB 706 & Green Chemistry			S				
F-GC-5	Brad Miller	BIFMA International	16-Nov-07	Green Chemistry in Office Furniture Products							
F-GC-6	Arlene Blum		16-Nov-07	California Bed Clothing Flammability Standard and Green Chemistry			S				
F-GC-7	Justin Augustine		16-Nov-07	Center for Biological Diversity Comments		I	S		E	R	
F-GC-8	Trudy Fisher			Comments - California Green Chemistry Initiative							
F-GC-9	Leslie Tamminen	Legislative Director/EEI Director Heal the Bay		Education and the Environment Initiative		I	S		E		
F-GC-10	Arthur H. Purcell, PhD			The Green Chemistry Matrix							
F-GC-11	California Association of RV Parks and Campgrounds			CalARVC's Comments			S				
F-GC-12	Johnson & Johnson			Johnson & Johnson - Additional Comments		I	S	V	E	R	
F-GC-13	Clif McFarland			Policy Options		I	S			R	
F-GC-14	Frank Teng			Policy Elements proposed by the Silicon Valley Leadership Group	D	I		V	E		
F-GC-15	Alastair Iles	UC Berkeley		An integrated green chemistry program		I	S		E	R	
F-GC-16	Mark Rohr	Albemarle Corporation		An Opportunity for Enhance Educational Partnerships		I		V	E	R	
F-GC-17	Western States Petroleum Association			WSPA's Comments on the California Green Chemistry Initiative							
F-GC-18	Walter M. McClelland			Concerned About Safety of Products			S				
F-GC-19	Diane Brodd			California Green Chemistry Initiative - Comments			S				
F-GC-20	Linda Blackwell			Comments on the California Green Chemistry Initiative		I	S				
F-GC-21	Andrew R Hackman	Manager, State Affairs Programs		CSPA Summary Comments on the California Green Chemistry Initiative	D	I	S		E	R	

Green Chemistry

Green Chemistry										
Number	Name	Organization/Company	Date Posted	Topic	Category(ies)					
F-GC-22	Amber Wise	 Amber Wise, PhD student, UC Berkeley Chem Dept	16-Nov-07	Through Innovation, Education and Communication, we can improve our health and safety	D	I	S	E		
F-GC-23	Mike Walls		16-Nov-07	ACC Final Comments to the "Conversation with California"	D	I	S	V	E	R
F-GC-24	Mike Walls		16-Nov-07	ACC Proposals for Future Actions Related to California Green Chemistry Initiative	D	I	S	E	R	
F-GC-25	David W. Owens	Director of Polymer Additives R&D Albemarle Corporation Baton Rouge, LA.	16-Nov-07	Sustainable Flame Retardant Design- Albemarle Corporation						
F-GC-26	Bromine Science and Environmental Forum		16-Nov-07	Some Principles for Consideration	D	I				
F-GC-27	Veronique Steukers		16-Nov-07	Feedback from Albemarle Europe				E		
F-GC-28	Paul Noe		16-Nov-07	Perspective of Affected Industries on California Green Chemistry Initiative						
F-GC-29	Lorraine Larsen-Hallock		16-Nov-07	Use of existing data and tools to implement the Green Chemistry Initiative	D	I	S	E		
F-GC-30	Ray Dawson		16-Nov-07	Comments from Albemarle Corporation	D	I		V		
F-GC-31	Amy D. Kyle, PhD MPH		16-Nov-07	Science base for moving to low hazard chemicals	D					
F-GC-32	Paul Noe		16-Nov-07	GMA's Perspective on a Framework for Green Chemistry	D	I	S	V	E	R
F-GC-33	Greg	Los Angeles, CA	16-Nov-07	Taking A Step Back						
F-GC-34	Len Sweet, PhD, MPH, MSc	Senior Health Scientist ChemRisk, Inc.	16-Nov-07	Senior Health Scientist, ChemRisk Inc.	D		S			
F-GC-35	Brenda K. Veronda	Manager, Corporate Communications Carus Corporation	16-Nov-07	Manager, Corporate Communications		I		V	E	A
F-GC-36	Jason Grev		16-Nov-07	Ecolab, Inc. Comments Regarding California's Green Chemistry Initiative	D	I	S			T
F-GC-37	ExxonMobil Chemical		15-Nov-07	ExxonMobil Chemical's Thoughts on California's Green Chemistry Initiative	D					
F-GC-38	Dr. Katy Wolf		15-Nov-07	First Steps in Green Chemistry				E		

Green Chemistry

Green Chemistry							
Number	Name	Organization/Company	Date Posted	Topic	Category(ies)		
F-GC-39	Martin Mulvihill	5th Year Graduate Student John Arnold and Peidong Yang Labs Department of Chemistry UC Berkeley	15-Nov-07	Educating the Chemists of Tomorrow: The Current State of Green Chemistry in Academia (POSTED 3X)		I	V E R
F-GC-40	Bayer MaterialScience		15-Nov-07	Bayer MaterialScience's Comments on California Green Chemistry Initiative	D	I S	V E R T A
F-GC-41	Philip G. Lewis, M.D., M.P.H.		15-Nov-07	Comments on Green Chemistry from Rohm and Haas Company		I S	R
F-GC-42	Philip G. Lewis, M.D., M.P.H.		15-Nov-07	Comments from Rohm and Haas Company		I S	R
F-GC-43	Andy Peri	Green Sangha	15-Nov-07	Green Chemistry Initiative Public Comments			
F-GC-44	Ahmad Khalifeh	Managing Director Albemarle Middle East & General Manager of Jordan Bromine Comapny, both affilaites of Albemarle Corporation.	15-Nov-07	Harmonization of Regulations		S	E
F-GC-45	Thomas R. Jacob, DuPont		15-Nov-07	WHY ARE WE DOING THIS?		S	E
F-GC-46	Edward Woodhouse		15-Nov-07	Professor of Political Science, Rensselaer Polytechnic Institute		I	
F-GC-47	Paul DeLeo	The Soap and Detergent Association	15-Nov-07	Green Chemistry and Beyond: Sustainability, Safety and Continual Improvement	D	S V	R A
F-GC-48	Dr. Yaseen Khayyat		15-Nov-07	Director General of the Jordan Institution for Standards and Metrology		S	
F-GC-49	Amanda Hawes		15-Nov-07	Green Chemistry Should Incorporate an Alternatives Assessment Decision-Making Process			
F-GC-50	Dale Karen Silverman, CAE< SPHR		14-Nov-07	AWFS Comments on the Green Chemistry Initiative		S	
F-GC-51	Ray Paulson, P.E	Fleet Readiness Center Southwest North Island	14-Nov-07	Feedback - California Green Chemistry Initiative	D		
F-GC-52	Bob Lucas	CCEEB	14-Nov-07	The Green Chemistry Initiative Should Consider All Existing Programs That Regulate Toxicity, Risk Management and Reporting			
F-GC-53	George R. Thompson, Ph.D.	President, CCS	14-Nov-07	Making the California Green Chemistry Initiative Workable	D	S V	T
F-GC-54	George Kopcsak		14-Nov-07	Measuring the Greenness of Products	D	S	

Green Chemistry

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)						
F-GC-79	Ted Nickerson		25-Oct-07	I do not understand the message of this post.	D	S					
F-GC-80	Cayce Warf		22-Oct-07	Director, Environmental Sustainability Programs							
F-GC-81	jesse goldstien		22-Oct-07	lots of post's NO DIALOUGE							
F-GC-82	Joseph H. Guth, Ph.D., J.D.	Legal Director Science & Environmental Health Network	21-Oct-07	The Chemicals Market Cannot Generate Green Chemicals Unless the Data Gap is Closed	D	I	S	V		R	A
F-GC-83	jesse goldstien		22-Oct-07	the shift in the tide will occur when this happens.....							
F-GC-84	Mike Walls	American Chemistry Council	19-Oct-07	Risk-Based Evaluation – the One Approach that Makes Sense	D	S					
F-GC-85	Thomas W. Oakes		19-Oct-07	Green Clean Renewable Energy Generated On-Site							
F-GC-86	Risk Assessment Methodologies (RAM) Technical Committee		19-Oct-07	Risk Assessment Methodologies (RAM) Technical Committee	D						
F-GC-87	J. C. King		19-Oct-07	Quantitative Assessments of "Green" Munitions and Chemicals of Concern	D	S					
F-GC-88	Barbara	OEHHA	16-Oct-07	Consider Eco endpoints in green chemistry initiative	D						
F-GC-89	jesse goldstien		22-Oct-07	not good enough for me...							
F-GC-90	Bill Tomlinson & Joel Ross		11-Oct-07	Environmental Impact Database for Point-of-Purchase Access				V	E		T A
F-GC-91	Linda Gianelli Pratt		11-Oct-07	How is this different from Design for the Environment?						R	A
F-GC-92	stan		26-Oct-07	Is this an evolution or renaming of a concept?						R	A
F-GC-93	Andria Ventura	Clean Water Action	9-Oct-07	Program Manager				E			
F-GC-94	Mike Walls	American Chemistry Council	3-Oct-07	Green Chemistry & Product Stewardship							
F-GC-95	Phillip Lo		1-Oct-07	Biomonitoring should be a part of the green chemistry policy		I				R	T
F-GC-96	Tyrone D. Nordqui		28-Sep-07	Quantitative Web-based "Green" Munitions Analyses	D	S					
F-GC-97	Mike Walls	American Chemistry Council	28-Sep-07	ACC's Perspectives on California's Green Chemistry Initiative	D	S	V				A
F-GC-98	Raymond Paulson		27-Sep-07	Quantitative Green Ranking for All Chemicals	D	S					
F-GC-99	Michael Lipsett, M.D.		21-Sep-07	Green Chemistry Initiative should not be used to oppose efforts to reduce exposures to toxic chemicals		I	S				
F-GC-100	jesse goldstien		15-Oct-07	amen...							
F-GC-101	Terry Collins		21-Sep-07	Lord Professor of Chemistry		I		V	E	R	T
F-GC-102	Green Chemistry team for Gary Polakovic		17-Sep-07	Summary of the Green Chemistry panel at the Society of Environmental Journalists National Conference		I	S		E	R	T

Toxic By Design

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)							
F-TD-29	Susan Killian, M.S. Hom		16-Nov-07	chemicals??	D	S						
F-TD-30	Nora Hull		15-Nov-07	Help the Environment Without Hurting Animals!	D	S						
F-TD-31	Helen Lam		15-Nov-07	Green chemistry without animal testing	D	S						
F-TD-32	Nicole Dupas		15-Nov-07	Stop animal testing!!!	D	S						
F-TD-33	Bayer MaterialScienc		15-Nov-07	Bayer MaterialScience's Comments on California Green Chemistry Initiative	D	I	S	V	E	R	T	A
F-TD-34	Theresa		15-Nov-07	testing	D	S						
F-TD-35	Philip G. Lewis, M.D., M.P.H.		15-Nov-07	Comments from Rohm and Haas Company		I	S			R		
F-TD-36	Pat Hayes		15-Nov-07	P&G's Recommendations for Advancing California's Green Chemistry Initiative	D	I	S		E	R		A
F-TD-37	Andy Peri	Green Sangha	15-Nov-07	Green Chemistry Initiative Public Comments								
F-TD-38	amber		15-Nov-07	being green also includes protecting animals	D	S						
F-TD-39	Paul DeLeo	The Soap and Detergent Association	15-Nov-07	Green Chemistry and Beyond: Sustainability, Safety and Continual Improvement	D	I	S		E	R	T	A
F-TD-40	Amanda Johnson		14-Nov-07	Stop Testing On Animals!	D	S						
F-TD-41	nancy low		15-Nov-07	please end testing of chemicals on animals	D	S						
F-TD-42	Ray Paulson, P.E.	Fleet Readiness Center Southwest North Island	14-Nov-07	Feedback - California Green Chemistry Initiative	D	S		E				
F-TD-43	Andria Ventura	Clean Water Action	14-Nov-07	information is key	D	S						
F-TD-44	George R. Thompson, Ph.D	President, CCS	15-Nov-07	The CCS tools	D			V			T	
F-TD-45	Andria Ventura	Clean Water Action	14-Nov-07	The Green Chemistry Initiative Should Consider Risk Management and Net Benefit	D	S						
F-TD-46	George R. Thompson, Ph.D.	President, CCS		Making the California Green Chemistry Initiative Workable	D	S						
F-TD-47	Janet Girard		14-Nov-07	No animal testing!!	D	S						
F-TD-48	Devri Speaks		14-Nov-07	No Animal testing, please...	D	S						
F-TD-49	Justin Thind		14-Nov-07	VIVIsectVI (TWICE)	D	S						
F-TD-50	Charlotte Duncan		14-Nov-07	Are You Kidding Me?	D	S						
F-TD-51	George Kopcsak		14-Nov-07	Measuring the Greenness of Products	D	S						
F-TD-52	renee		13-Nov-07	Stop testing on animals	D	S						
F-TD-53	Hugo Schwyzer		13-Nov-07	To be green is also to be cruelty free	D	S						
F-TD-54	McKenzie		13-Nov-07	Be Green: Protecting the Environment Includes Animals	D	S						
F-TD-55	Dow Chemical Company		13-Nov-07	Dow Chemical's Comments on Chemical Management Systems	D	S		V				
F-TD-56	Rene		13-Nov-07	Ms	D	I	S					
F-TD-57	Bromine Science and Environmental Forum	(BSEF)	13-Nov-07	BSEF's Chemical Policy Recommendations			S	V				
F-TD-58	Jill West		13-Nov-07	A State with a Conscience Uses Non-Animal Testing	D	S						
F-TD-59	navid bayar		13-Nov-07	california should set a humane standard!	D	S						
F-TD-60	Jazz XB		13-Nov-07	Be Kind	D	S						

Toxic By Design

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)						
F-TD-94	Marian Blum		11-Nov-07	Animal Experimentation is unethical	D	S					
F-TD-95	Devon		11-Nov-07	Please consider the alternative methods for testing	D	S					
F-TD-96	Sandra Malone		11-Nov-07	Non-Animal Testing Is a Win-Win Situation	D	S					
F-TD-97	Aurelia Dandrea		11-Nov-07	Redundant, innacurate, unethical	D	S					
F-TD-98	Jennifer Deming		11-Nov-07	Please leave animals alone!	D	S					
F-TD-99	Ann		11-Nov-07	There's no question we need to learn more about the toxins in our environment, but we need to do it in the most accurate, efficient, timely manners possible...	D	S					
F-TD-100	Sushmita Shrivastava		11-Nov-07	Animal Testing Cruel, Unethical & inaccurate	D	S					
F-TD-101	Maria Burman		11-Nov-07	A Green Program should be frendly to all, including animals!	D	S					
F-TD-102	Rache		11-Nov-07	Protect the Environment Accurately!!	D	S					
F-TD-103	Emily		10-Nov-07	Stop Cruel and Useless Animal Testing!!!	D	S					
F-TD-104	Darin Read		10-Nov-07	Animal testing is disgusting	D	S					
F-TD-105	R B		10-Nov-07	Animals Have Nervous Systems Just Like You	D	S					
F-TD-106	Scott Hexte		10-Nov-07	Don't Test On Animals -- They Aren't Predictive of Results on Humans	D	S					
F-TD-107	ds eva		10-Nov-07	The planet will die (& us with it) unless we change to green ways	D	S					
F-TD-108	Susan BSN, RN		10-Nov-07	Animal Toxicity testing does not extrapolate to humans; it wastes our precious taxpayer dollars!!!	D	S					
F-TD-109	Ilaria Accorsi		10-Nov-07	Animal testing cannot be the only option. Don't do it	D	S					
F-TD-110	Rebecca		10-Nov-07	No Animal Testing!	D	S					
F-TD-111	Renee Boteilho		10-Nov-07	Animals should never be used for this horrific inhumane testing	D	S					
F-TD-112	Roland R Houle		11-Nov-07	The traditional approach to gauging the potentially harmful effects	D	S					
F-TD-113	Joseph		10-Nov-07	Animal testing ?	D	S					
F-TD-114	Renee Boteilho		10-Nov-07	Animal tests are cruel and useless	D	S					
F-TD-115	Arlen Stahlberg		10-Nov-07	end to crueil and painful treatment of animals	D	S					
F-TD-116	Dora Mitc		10-Nov-07	Californians want their state to be forward-thinking.	D	S					
F-TD-117	Naila M. Sanchez		10-Nov-07	Stop animal research... Cruel AND inaccurate!	D	S					
F-TD-118	Renee Boteilh		10-Nov-07	Animal testing is cruel and inhumane	D	S					
F-TD-119	Darla Brun		10-Nov-07	ANIMAL TESTS INHUMANE UNETHICAL AND NOT APPLICABLE TO HUMANS	D	S					
F-TD-120	Lori		10-Nov-07	No Animal Testing!	D	S					
F-TD-121	T. Maraine		10-Nov-07	Protect Humans, but Use Tests that Work and Don't Harm Animals	D	S					
F-TD-122	K Taylor		10-Nov-07	Pain and suffering cannot be justified	D	S					
F-TD-123	Renee Boteilh		10-Nov-07	LEAVE ANIMALS ALONE!	D	S					
F-TD-124	Ed kilduf		10-Nov-07	Painful Test to Animals	D	S					
F-TD-125	Nia Bias		10-Nov-07	Animal Testing	D	S					
F-TD-126	Robyn		10-Nov-07	No animal testing please, its not nessiscary	D	S					

Toxic By Design

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)							
F-TD-127	dominique mal		10-Nov-07	why animals	D	S						
F-TD-128	Sushmita Shrivastava		10-Nov-07	Animal-based toxicity testing methods are CRUEL & INACCURATE	D	S						
F-TD-129	THoa		10-Nov-07	End Useless Animal Testing	D	S						
F-TD-130	Cesar Chavez		10-Nov-07	Don't listen to human-hating animal rights nuts	D	S						
F-TD-131	Martha		10-Nov-07	GW not an excuse to waste \$\$ or lives	D	S						
F-TD-132	John T		10-Nov-07	Stop Toxicity Tests on Animals	D	S						
F-TD-133	Prakash Shrivastava		10-Nov-07	Mr	D	S						
F-TD-134	shira		10-Nov-07	ms	D	S						
F-TD-135	Rev. A. Reynolds		10-Nov-07	Animal torture is scientifically useless	D	S						
F-TD-136	Dave Kisor		10-Nov-07	If you must test, insist upon using the CEO of the company.	D	S						
F-TD-137	S Gordon		9-Nov-07	Let's get past medieval methods for toxicity testing	D	S						
F-TD-138	ed pilolla		9-Nov-07	no animals tests, please	D	S						
F-TD-139	Brienne DeJong		9-Nov-07	No Animal Tests	D	S						
F-TD-140	Sophia		9-Nov-07	Where do you draw the line?	D	S						
F-TD-141	Cheryl Toth		9-Nov-07	Animal tests are CRUEL and INACCURATE for HUMANS	D	S						
F-TD-142	Kris Gata		9-Nov-07	The preservation of our environment should go hand in hand with the preservation of life, not one for the other, otherwise it will ultimately defeat its purpose.	D	S						
F-TD-143	Tricia Philipson		9-Nov-07	Animal testing cannot be extrapolated to Homo Sapiens!	D	S						
F-TD-144	Tricia Philipson		9-Nov-07	The Importance Of Life	D	S						
F-TD-145	Mary Vincent		9-Nov-07	Stop useless animal testing	D	S						
F-TD-146	Karen Leyva		9-Nov-07	ANIMAL TESTING DOES NOT WORK !!	D	S						
F-TD-147	Will		9-Nov-07	Violence toward animals boomerangs as disease in humans	D	S						
F-TD-148	Sandra Villavicencio		9-Nov-07	Animal Testing is NOT Necessary in this Day and Age	D	S						
F-TD-149	shoshana anne simon		9-Nov-07	Animal tests are misleading and are torture	D	S						
F-TD-150	Rory Freedma		9-Nov-07	Testing on animals is not only cruel, it's dangerous.	D	S						
F-TD-151	M. Barbour		9-Nov-07	Is this 2007?	D	S						
F-TD-152	Gabriel T		9-Nov-07	mr.	D	S						
F-TD-153	Masha		9-Nov-07	Please don't use animals, I've heard them cry!	D	S						
F-TD-154	Annie		9-Nov-07	anti-animal testing reason	D	S						
F-TD-155	Annie		9-Nov-07	animal-testers	D	S						
F-TD-156	KRin		9-Nov-07	Why would any agency consider animal testing?	D	S						
F-TD-157	stacia brezlin		9-Nov-07	animal testing? are you kidding me?	D	S						
F-TD-158	CF		9-Nov-07	No More Animal Testing	D	S						
F-TD-159	Lauren Perez		9-Nov-07	Useless, outdated information.	D	S						
F-TD-160	Misha Havtik		9-Nov-07	Vioux legacy	D	S						

Toxic By Design

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)						
F-TD-161	J.N. Petzak		9-Nov-07	NO MORE EXCUSES FOR BAD SCIENCE AND TAKING OF LIVES	D	S					
F-TD-162	virginia khan		9-Nov-07	animal testing	D	S					
F-TD-163	WT		9-Nov-07	END ANIMAL TESTING	D	S					
F-TD-164	Patricia Ryman		9-Nov-07	Stop Useless Animal Testing	D	S					
F-TD-165	NICOLE BLUME		9-Nov-07	No more animal tests	D	S					
F-TD-166	compassionate consumer		9-Nov-07	saving lives both animal and human a like	D	S					
F-TD-167	Barbara Gladfelter		9-Nov-07	Come out of the Dark Ages--stop animal testing.	D	S					
F-TD-168	Malcolm J Blue		9-Nov-07	Mr.	D	S					
F-TD-169	R. McDonough		9-Nov-07	If you wouldn't test it on your child, don't test it on an animal	D	S					
F-TD-170	Charlotte Wagner		9-Nov-07	Animal Tests Are Ineffective	D	S					
F-TD-171	Martine Faguy		9-Nov-07	The difference between a baby and an animal = nothing	D	S					
F-TD-172	Lynda Ballaban		9-Nov-07	Animals feel pain just as people do only they do not have a voice	D	S					
F-TD-173	Mary		9-Nov-07	Tell CalEPA to Stop Toxicity Tests on Animals and Use Instead Sound Alternative Methods	D	S					
F-TD-174	Athel Herman		9-Nov-07	It is time to stop testing on animals	D	S					
F-TD-175	Janet		9-Nov-07	Please Stop!	D	S					
F-TD-176	Scott Hurlbert		9-Nov-07	Do not use animals for testing	D	S					
F-TD-177	Patsy Henderson		9-Nov-07	truly barbaric	D	S					
F-TD-178	Anthony Montapert		9-Nov-07	Animal Testing is Unreliable	D	S					
F-TD-179	D. Halstead		9-Nov-07	Testing on Animals	D	S					
F-TD-180	Mark Mcclasky		9-Nov-07	Animal Testing ... Are you kidding me?	D	S					
F-TD-181	Michael Prasad		9-Nov-07	No need for outdated science	D	S					
F-TD-182	JOAN CAREY		9-Nov-07	ANIMAL TESTS ARE CRUEL AND USELESS! PLS STOP!	D	S					
F-TD-183	William Kleinbauer		9-Nov-07	Do not do Animal Testing!	D	S					
F-TD-184	Tammy		9-Nov-07	NO ANIMAL TESTING	D	S					
F-TD-185	Candi Ausman		9-Nov-07	Ms.	D	S					
F-TD-186	V.Belt		9-Nov-07	No Animal Testing	D	S					
F-TD-187	Barbara Weith		9-Nov-07	Intelligent Humane Testing is the Way to Go	D	S					
F-TD-188	Jane Bock		9-Nov-07	Please use human-focused testing methods to keeps CA healthy!	D	S					
F-TD-189	Lydia		9-Nov-07	Please stop animal testing	D	S					
F-TD-190	Mark F		9-Nov-07	ALTERNATIVE METHODS...NO ANIMAL KILLING (TWICE)	D	S					
F-TD-191	MCarter		9-Nov-07	Abandon animal-based toxicity testing	D	S					
F-TD-192	Ruth Feldman		9-Nov-07	Ms	D	S					
F-TD-193	T.J. Mercer		9-Nov-07	Abandon Unnecessary and Cruel Animal Testing	D	S					
F-TD-194	Shelb		9-Nov-07	Stop the Testing on Animals	D	S					
F-TD-195	Diane Weingroff		9-Nov-07	No Animal Testing	D	S					

Toxic By Design

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)						
F-TD-196	Valerie Dodson		9-Nov-07	Please do not allow more animals to be used for needless testing!!	D	S					
F-TD-197	Dow Chemical Company		9-Nov-07	Dow Chemical's Comments on Educational Programs				E			
F-TD-198	Adrienne Guy		9-Nov-07	Step Testing on Animals	D	S					
F-TD-199	Rhea Damon		9-Nov-07	sad legacy (TWICE)	D	S					
F-TD-200	Pat Bryan		9-Nov-07	Ms	D	S					
F-TD-201	Nancy Wang		9-Nov-07	No more animal cruelty with testing	D	S					
F-TD-202	Giamonet		9-Nov-07	Please don't test on animals.	D	S					
F-TD-203	Crystal McKinney		9-Nov-07	Stop animal testing	D	S					
F-TD-204	Karen Stanley		9-Nov-07	stop testing on animals and use alternative methods	D	S					
F-TD-205	Ro		9-Nov-07	Please! Be Humane!	D	S					
F-TD-206	by: Alfredo Kuba		9-Nov-07	WASTEFUL, CRUEL AND UNETHICAL	D	S					
F-TD-207	Lar		9-Nov-07	No more animal testing	D	S					
F-TD-208	L. Doris		9-Nov-07	Stop unnecessary & cruel animal testing, NOW!	D	S					
F-TD-209	SEPIDA SAZGAR		9-Nov-07	please stop	D	S					
F-TD-210	Carolyn Sinclair		9-Nov-07	Stop Animal testing	D	S					
F-TD-211	Shannon Hunter		9-Nov-07	Stop Animal Testing	D	S					
F-TD-212	Mike Walls	American Chemistry Council	9-Nov-07	Toxics In Products By Design		S					
F-TD-213	Tracy Maguire		9-Nov-07	No more testing on animals	D	S					
F-TD-214	pcrm (pb: leslie atlan)		9-Nov-07	toxicity testing on animals	D	S					
F-TD-215	Mike Walls	American Chemistry Council	9-Nov-07	Understanding TSCA Sections 4 and 6	D	S					
F-TD-216	Richard Denison	Environmental Defense	16-Nov-07	Mike Walls of the American Chemistry Council (ACC) omits or glosses over key aspects of what EPA must do to use these authorities.		S					
F-TD-217	Raina L		9-Nov-07	Stop Toxicity Tests on Animals	D	S					
F-TD-218	Jessica Davis-Stein		9-Nov-07	Testing toxicity on animals is unethical, wasteful and counter-productive	D	S					
F-TD-219	LTurner		9-Nov-07	Create a Priority List	D	S					
F-TD-220	Rhonda Myers		9-Nov-07	Dr.	D	S					
F-TD-221	Susan Watts-Rosenfeld		9-Nov-07	Toxicity testing on animals	D	S					
F-TD-222	Kathlene Henry-Gorman		9-Nov-07	California need to lead the way for the environment!	D	S					
F-TD-223	Denise		9-Nov-07	CalEPA- recommendations on protect human health w/d to cruel lab. tests on animals.	D	S					
F-TD-224	kim bauer		9-Nov-07	mr	D	S					
F-TD-225	Gary M Flashner, MS, MD		9-Nov-07	Chemical Testing: Use Only Cell & Tissue Assays	D	S					
F-TD-226	Kelly Kramer		9-Nov-07	Science Without Sadistics	D	S					
F-TD-227	John Guislin		9-Nov-07	No animal testing: both a scientific and moral imperative	D	S					
F-TD-228	Jimmy Uranwala	Pleasanton CA	9-Nov-07	Going green does not require testing on animals	D	S					
F-TD-229	D. Snedden		9-Nov-07	No animal testing	D	S					
F-TD-230	Sarosh Kumana		9-Nov-07	Sustainability - the jigsaw puzzle							
F-TD-231	JM		9-Nov-07	Animal Testing is wrong and unnecessary	D	S					

Toxic By Design

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)							
F-TD-232	Alicia Snow		9-Nov-07	No more animal testing!	D	S						
F-TD-233	Vasu Murti		9-Nov-07	abolish animal testing and research	D	S						
F-TD-234	Wendy		9-Nov-07	California needs to be smart, not cruel ...	D	S						
F-TD-235	Dusti		9-Nov-07	STOP DOING CRUEL TOXICITY TESTS ON ANIMALS	D	S						
F-TD-236	Carol Simone		9-Nov-07	Please stop all toxicity tests on animals	D	S						
F-TD-237	Carol Simone		9-Nov-07	Stop all toxicity tests on animals NOW!	D	S						
F-TD-238	zoe		9-Nov-07	please stop all animal testing	D	S						
F-TD-239	Andrew Hackman	Consumer Specialty Products Assoc	6-Nov-07	Thoughts on Fostering Product Stewardship	D	I	S	V	E	R	T	A
F-TD-240	Mike Walls	American Chemistry Council	3-Nov-07	Stimulating Green Chemistry	D	I			E	R	T	A
F-TD-241	California Medical Association	California Medical Association	2-Nov-07	A Modern Chemicals Policy For California			S					
F-TD-242	Kimberly Schulz	Enviro. Health & Resource Center	1-Nov-07	Check out This Tool that Will Work!!!	D		S					
F-TD-243	Kimberly Schulz	Enviro. Health & Resource Center	1-Nov-07	Ch	D		S					
F-TD-244	Rob Brushia		30-Oct-07	Total lifecycle evaluation	D			V				
F-TD-245	Rob Brushia		30-Oct-07	Green Energy and Renewable Resources		I		V		R		A
F-TD-246	Mike Walls	American Chemistry Council	29-Oct-07	Thoughts About Substitution			S	V	E			
F-TD-247	CHANGE		29-Oct-07	CHANGE's Perspective on a Successful Program	D	I	S	V	E	R	T	A
F-TD-248	Dow Chemical Company		29-Oct-07	Dow Chemical's Green Chemistry Thoughts	D	I			E			A
F-TD-249	Mike Walls	American Chemistry Council	26-Oct-07	Chemistry is Essential to California								A
F-TD-250	Richard Denison	Environmental Defense	25-Oct-07	Have EPA programs really closed the data gap?	D			V	E			
F-TD-251	Richard Denison	Environmental Defense	25-Oct-07	Some ideas for what California can do to start advancing chemicals policy	D		S		E	R		
F-TD-252	Richard Denison	Environmental Defense	25-Oct-07	Limitations to Risk-Drive Approaches to Chemical Prioritization	D	I	S	V			T	
F-TD-253	Laura M. Plunkett, Ph.D., DABT	Integrative Biostrategies LLC	22-Oct-07	The Dose –Response Principle is Key to a Science-Based Program	D							
F-TD-254	Ted Nickerson		25-Oct-07	Very informative.								
F-TD-255	Cayce Warf		22-Oct-07	Director Environmental Sustainability Programs	D		S					
F-TD-256	Mike Walls	American Chemistry Council	19-Oct-07	Risk-Based Evaluation – the One Approach that Makes Sense	D		S					
F-TD-257	J. C. King		19-Oct-07	Quantitative Assessments of "Green" Munitions and Chemicals of Concern	D		S					
F-TD-258	Mike Walls	American Chemistry Council	15-Oct-07	Addressing the Data Gaps	D							
F-TD-259	Mike Walls	American Chemistry Council	15-Oct-07	Innovation and Regulation		I	S	V	E	R	T	
F-TD-260	Tyrone D. Nordquist		4-Oct-07	Quantitative Web-based "Green" Munitions Analyses	D		S					
F-TD-261	Mike Walls	American Chemistry Council	3-Oct-07	Green Chemistry & Product Stewardship		I	S					
F-TD-262	Phillip Lo		1-Oct-07	Info on federal legislation on Green Chemistry from Chemistry and Engineering News, 9/17		I	S			R	T	

Toxic By Design

Toxic By Design										
Number	Name	Organization/Company	Date Posted	Topic	Category(ies)					
F-TD-263	Mike Walls	American Chemistry Council	28-Sep-07	ACC's Perspectives on California's Green Chemistry Initiative	D		S	V		A
F-TD-264	Raymond Paulson		27-Sep-07	Quantitative Green Ranking for All Chemicals	D		S			
F-TD-265	on behalf of DTSC Berkeley Regional Staff		25-Sep-07	Require Legislation			S			
F-TD-266	walt davie		25-Sep-07	health hazards of jet fumes						
F-TD-267	Dr. Katy Wolf		2-Oct-07	Legislative Changes		I	S	V	E	
F-TD-268	Eileen Hughes		21-Sep-07	Pharmaceuticals and Personal Care Products (PPCPs)	D	I	S		R	
F-TD-269	Terry Collins		21-Sep-07	Lord Professor of Chemistry						
F-TD-270	Rupali Das, MD, MPH		20-Sep-07	Worker health impacts should be part of cost-benefit decisions						
F-TD-271	Bruce Klafter	Sr. Director, EHS, Applied Material	17-Sep-07	Avoid one size fits all approaches						
F-TD-272	Robert Balisdell, Ph.D.		14-Sep-07	Senior Toxicologist, Office of Environmental Health Hazard Assessment						
F-TD-273	Dr. Nagaraj		17-Sep-07	California should certainly lead in this field.						

Toxic By Accident

Number	Name	Organization/ Company	Date Posted	Topic	Category(ies)
F-TA-1	Catherine T. (Katie) Hunt, President		19-Nov-07	American Chemical Society Response	I S
F-TA-2	Archie J. Beaton	Chlorine Free Products Assn.	19-Nov-07	Use of Existing Web-Based Tools to Certify "Green" Cleaning Products	D S
F-TA-3	Susan Foerster		16-Nov-07	Practical Issues for Identification and Management of Common Consumer Items by Public Agencies	D I S V E R T A
F-TA-4	Arlene Blum		16-Nov-07	The California Bed Clothing Flammability Standard and Green Chemistry	S
F-TA-5	Leslie Tamminen		16-Nov-07	Education and the Environment Initiative	S E
F-TA-6	Trudy Fisher		16-Nov-07	Comments - California Green Chemistry Initiative	
F-TA-7	California Association of RV Parks and Campgrounds		16-Nov-07	CalARVC's Comments	S
F-TA-8	Johnson & Johnson		16-Nov-07	Johnson & Johnson - Additional Comments	I S V E R
F-TA-9	Frank Teng		16-Nov-07	Policy Elements proposed by the Silicon Valley Leadership Group	D I S V E R T A
F-TA-10	Western States Petroleum Association		16-Nov-07	Green Chemistry Initiative	
F-TA-11	Walter M. McClelland		16-Nov-07	Concerned About Safety of Products	S
F-TA-12	Diane Brodd		16-Nov-07	California Green Chemistry Initiative - Comments	S
F-TA-13	Linda Blackwell		16-Nov-07	Comments on the California Green Chemistry Initiative	I S
F-TA-14	Andrew Hackman	Consumer Specialty Products Assoc	16-Nov-07	CSPA Summary Comments on the California Green Chemistry Initiative	I S V E R A
F-TA-15	Mike Walls		16-Nov-07	High Production Volume (HPV) Challenge Program: A Landmark Program Making More Health and Environmental Data Publicly Available Than Ever Before	D V R
F-TA-16	Paul Noe		16-Nov-07	Perspective of Affected Industries on California Green Chemistry Initiative	I
F-TA-17	Lorraine Larsen-Hallock		16-Nov-07	Use of existing data and tools to implement the Green Chemistry Initiative	D T
F-TA-18	Ray Dawson		16-Nov-07	Feedback from Albemarle Corporation	
F-TA-19	Paul Noe		16-Nov-07	GMA's Perspective on a Framework for Green Chemistry	D I S V E R A
F-TA-20	Bayer MaterialScience		15-Nov-07	Bayer MaterialScience's Comments on California Green Chemistry Initiative	D I S V E R T A
F-TA-21	Philip G. Lewis, M.D., M.P.H.		15-Nov-07	Comments from Rohm and Haas Company	I R
F-TA-22	Pat Hayes		15-Nov-07	P&G's Recommendations for Advancing California's Green Chemistry Initiative	D I S E R A

Toxic By Accident

Number	Name	Organization/ Company	Date Posted	Topic	Category(ies)
F-TA-23	Andy Peri		15-Nov-07	Green Chemistry Initiative Public Comments	
F-TA-24	Paul DeLeo	The Soap and Detergent Association	15-Nov-07	Green Chemistry and Beyond: Sustainability, Safety and Continual Improvement	D I S E R T A
F-TA-25	Bob Lucas	CCEEB	14-Nov-07	The Green Chemistry Initiative Should Consider Voluntary Programs and the Concepts of Sustainable Chemistry	I V
F-TA-26	George R. Thompson, Ph.D	President, CCS	14-Nov-07	Making the California Green Chemistry Initiative Workable	D S V T
F-TA-27	George Kopcsak		14-Nov-07	Measuring the Greeness of Products	D S
F-TA-28	Dow Chemical Company		13-Nov-07	Dow Chemical's Comments on Chemical Management Systems	D S V
F-TA-29	Bromine Science and Environmental Forum (BSEF)		13-Nov-07	BSEF's Chemical Policy Recommendations	S V
F-TA-30	JIP		12-Nov-07	Real risk	S
F-TA-31	Kevin Lyons, Ph.D.		12-Nov-07	Automated, Web-Based Assessment of "Green" Chemicals, Products and Processes for Procurement	D S V T
F-TA-32	Dow Chemical Company		9-Nov-07	Dow Chemical's Comments on Educational Programs	E
F-TA-33	Mike Walls	American Chemistry Council	9-Nov-07	Understanding TSCA Sections 4 and 6	D S
F-TA-34	Richard Denison	Environmental Defense	16-Nov-07	Mike Walls of the American Chemistry Council (ACC) omits or glosses over key aspects of what EPA must do to use these authorities.	S
F-TA-35	Mike Walls	American Chemistry Council	9-Nov-07	Toxics In Products By Accident	I S R
F-TA-36	Andrew Hackman	Consumer Specialty Products Assoc.	6-Nov-07	Thoughts on Fostering Product Stewardship	D I S V E R T A
F-TA-37	Mike Walls	American Chemistry Council	3-Nov-07	Stimulating Green Chemistry	
F-TA-38	California Medical Association		2-Nov-07	A Modern Chemicals Policy For California	S
F-TA-39	anonymous		2-Nov-07	How did it get there?	
F-TA-40	Kimberly Schulz	Enviro. Health & Resource Center	1-Nov-07	Check out This Tool that Will Work!!!	D S
F-TA-41	Mike Walls	American Chemistry Council	29-Oct-07	Thoughts About Substitution	S V E
F-TA-42	CHANGE		29-Oct-07	CHANGE's Perspective on a Successful Program	D I S V E R T A
F-TA-43	Dow Chemical Company		29-Oct-07	Dow Chemical's Green Chemistry Thoughts	D I E A
F-TA-44	Richard Denison	Environmental Defense	25-Oct-07	Have EPA programs really closed the data gap?	D V E
F-TA-45	Richard Denison	Environmental Defense	25-Oct-07	Some ideas for what California can do to start advancing chemicals policy	D S E R

Toxic By Accident

Number	Name	Organization/ Company	Date Posted	Topic	Category(ies)							
F-TA-46	Richard Denison	Environmental Defense	25-Oct-07	Limitations to Risk-Driven Approaches to Chemical Prioritization	D	I	S	V			T	
F-TA-47	Laura M. Plunkett, Ph.D., DABT		22-Oct-07	The Dose –Response Principle is Key to a Science-Based Program	D							
F-TA-48	Cayce Warf		22-Oct-07	Director, Environmental Sustainability Programs	D		S					
F-TA-49	Mike Walls	American Chemistry Council	19-Oct-07	Risk-Based Evaluation – the One Approach that Makes Sense	D		S		E			
F-TA-50	J. C. King		19-Oct-07	Quantitative Assessments of “Green” Munitions and Chemicals of Concern	D		S					
F-TA-51	Mike Walls	American Chemistry Council	15-Oct-07	Addressing the Data Gaps	D							
F-TA-52	Mike Walls	American Chemistry Council	15-Oct-07	Innovation and Regulation		I	S	V	E	R	T	
F-TA-53	Tyrone D. Nordquist		4-Oct-07	Quantitative Web-based "Green" Munitions Analyses	D		S					
F-TA-54	Mike Walls	American Chemistry Council	28-Sep-07	ACC's Perspectives on California's Green Chemistry Initiative	D		S	V				A
F-TA-55	Raymond Paulson		27-Sep-07	Quantitative Green Ranking for All Chemicals	D		S					
F-TA-56	DTSC Berkeley Regional Staff		27-Sep-07	Government test all new products.			S					
F-TA-57	Dr. Katy Wolf		2-Oct-07	Legislative Changes		I	S		E	R		
F-TA-58	Terry Collins		21-Sep-07	Lord Professor of Chemistry	D		S		E			

Cradle to Cradle

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)								
J-C2C-16	Sandy McDonald	CEO, Managing Partner, GreenHouse Partners An early stage startup focused on rapid commercialization of green technologies and green chemistry. MS Degree, Polymer Science, BS Degree, Chemistry	23-Jun-07	YES!!! Let's get started.									
J-C2C-17	John Goodrich		23-Jun-07	If California installs Plasma Reactors at waste managements site									
J-C2C-18	Frank Teng		26-Jun-07	Silicon Valley Leadership Group							E		
J-C2C-19	Suzanne Hagen		27-Jun-07	There appears to be a complete disregard for TSCA	D								
J-C2C-20	Steven Levine		12-Jul-07	Excellent Packaging & Supply									
J-C2C-21	Andria Ventura	Clean Water Action	16-Jul-07	I am a bit disappointed by the degree of cynicism expressed on this Blog	D	I	S	V					
J-C2C-22	Michael Cox	New Almaden, CA	23-Jul-07	The post from Mr. Tom Jacob – DuPont, Sacramento, is one that should be read carefully			S	V					
J-C2C-23	Nick Sleeth		25-Jul-07	I believe the Green Chemistry Initiative to be our one, best chance									
J-C2C-24	Merob Shimeles	DTSC	26-Jul-07	Dear Director Gorsen									
J-C2C-25	Nick Sleeth		28-Jul-07	I had neglected to mention									
J-C2C-26	Peggy Harris	Team Leader, Cradle to Cradle Team	14-Aug-07	Existing Chemicals	D		S						
J-C2C-27	Green Chemistry Team		30-Aug-07	The Green Chemistry Initiative held a public stakeholder meeting	D	I	S	V	E	R			

Green Chemistry

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)							
J-GC-1	Joe Lyou	California Environmental Rights Alliance www.EnviroRights.org	14-Jun-07	my initial comments on your Green Chemistry Initiative	D		S		E			
J-GC-2	Robert J. Brushia	Senior Scientist California Environmental Protection Agency's Department of Toxic Substances Control Hazardous Waste Management Program Regulatory and Programs Development Division	14-Jun-07	DTSC, and Cal/EPA ought to strongly consider forming a partnership with the UC. In Mass	D			V		R	T	
J-GC-3	Michael Wilson	Assistant Research Scientist Center for Occupational and Environmental Health School of Public Health University of California, Berkeley	15-Jun-07	Green Chemistry in California: points to the problems of the Data, Safety, and Technology Gaps	D	I	S	V			T	
J-GC-4	Amy Kyle	Associate Research Scientist and Lecturer Project on Science and Policy for Health and Environment School of Public Health, University of California, Berkeley	15-Jun-07	Dear Director Gorsen	D					R		
J-GC-5	Ken Wiener, MS		19-Jun-07	comment on the Green Chemistry Initiative						R		
J-GC-6	Robert Johnson	Industry Environmental Specialist	19-Jun-07	California Chemical List of Lists	D							
J-GC-7	Thomas W. Oakes, PhD	Solar Hydrogen Co	20-Jun-07	to create energy with no harmful chemistry to California.								
J-GC-8	Keith Winkler		20-Jun-07	REACH	D							
J-GC-9	Doug Schoon		21-Jun-07	properly define "toxic" and "non-toxic"					E			
J-GC-10	Jim Bell		25-Jun-07	Precautionary principal and Law	D	I	S					
J-GC-11	Kathleen Richter		25-Jun-07	There are two ways I believe we could solve this problem:		I						
J-GC-12	Michael Folkins		25-Jun-07	non-toxic is over stated								
J-GC-13	Frank Teng		26-Jun-07	The Silicon Valley Leadership Group	D	I	S	V	E	T	A	
J-GC-14	Olof Hansen		27-Jun-07	a green product is a better product								
J-GC-15	Joe Gannon		30-Jun-07	chemicals used for water treatment		I	S					A

Green Chemistry

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)								
J-GC-16	Claudette L. Main		2-Jul-07	to be green in using all biodegradable cleaning products									
J-GC-17	Randy Fischback	Public & Government Affairs	3-Jul-07	California Environmental Protection Agency's Green Chemistry Initiative	D	I				E			
J-GC-18	Bob Rawson	President, International Wastewater Solutions Corp. iws@sonic.net	11-Jul-07	emphasize strict labeling of contents						E			
J-GC-19	Robert M. Hafner, ASP	Safety Manager	19-Jul-07	The end result is a greater risk of exposure for the company and the communities.									
J-GC-20	Sarojini Balachandra PhD	DTSC	20-Jul-07	An Idea to be Included in to K- 12 Education						E			
J-GC-21	Merob Shimeles	DTSC	26-Jul-07	Research Council of the National Academies' report						E			
J-GC-22	Jeff Henderson		28-Jul-07	our state's ability to compete, let alone lead and influence		I							
J-GC-23	Sam Bell	Water Quality Committee Chairman Metal Finishing Association of Southern California	1-Aug-07	CYANIDE IS GREEN						E			
J-GC-24	Micheal Wadas		3-Aug-07	We already know what materials work, and what don't			S						
J-GC-25	Farrell F. Neeley, PhD		5-Aug-07	re-formulations and re-engineering of chemical processes		I							
J-GC-26	Green Chemistry Team		30-Aug-07	The Green Chemistry Initiative held a public stakeholder meeting	D	I				E	R	T	A
J-GC-27	John Farley		11-Sep-07	restriction of chemicals should only apply to formulators/ manufacturers	D		S						

Toxic By Design

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)															
J-TD-1	Allan L. Griff	Consulting Engineer	15-Jun-07	"Please don't lose sight of the environmental advantages provided by plastics."																
J-TD-2	tahoegreen		19-Jun-07	PEX plumbing				S												
J-TD-3	Kurt Neutgens		20-Jun-07	Elimination of chemicals in our lawns and gardens...				S												
J-TD-4	anon		20-Jun-07	LA area				S												
J-TD-5	Doug Schoon		21-Jun-07	Properly define "toxic" and "non-toxic"...								E								
J-TD-6	Lyle Vander Velde		25-Jun-07	While pondering this question I found myself separating it into two parts.			I	S	V										A	
J-TD-7	Frank Teng		26-Jun-07	The Silicon Valley Leadership Group																
J-TD-8	Robert Brushia		2-Jul-07	Huge data gathering and database development effort	D					V				R						
J-TD-9	Loni Adams		3-Jul-07	The City of San Clemente				S												
J-TD-10	Claudette L. Main		3-Jul-07	Drinking water distribution companies																
J-TD-11	Rob Brushia		16-Jul-07	Environmentally friendly electroplating technologies.				S												
J-TD-12	Michael Cox	New Almaden, CA	8-Aug-07	I agree with Robert Brushia	D					V									T	
J-TD-13	Michael Kirschner		14-Aug-07	Recall related to toxic materials																
J-TD-14	Michael Kirschner		14-Aug-07	Regarding Rob Brushia's post																
J-TD-15	B. Massey		15-Aug-07	Would such a policy create incentives for companies...				S												
J-TD-16	Andria Ventura	Clean Water Action	15-Aug-07	Mattel recall	D															
J-TD-17	Beverly Karplus Hartline		16-Aug-07	It is great to see California taking the lead on this issue.	D		I	S						R						
J-TD-18	Green Chemistry Team		30-Aug-07	Public stakeholder meeting on August 17th in San Jose.	D		I	S	V		E		R	T	A					
J-TD-19	Andria Ventura	Clean Water Action	30-Aug-07	If a toxin in a product is intentional or accidental.				S	V											
J-TD-20	Michael Kirschner		30-Aug-07	Manufacturers must be responsible				S												
J-TD-21	B. Carter		7-Sep-07	Ban the sale of toxics in products by design in California				S												
J-TD-22	Aron		7-Sep-07	Basic (good) public policy: Tax what you don't want.			I							R						

Toxic By Design

Number	Name	Organization/Company	Date Posted	Topic	Category(ies)								
J-TD-23	Ken S		10-Sep-07	Use of toxic (perc) de-greasers		I							
J-TD-24	Jay Schreider		10-Sep-07	submit the following ideas to be considered as options	D		S		E		T		
J-TD-25	Rob Brushia		12-Sep-07	The U.S. EPA has partnered with various stakeholders and industry groups	D	I	S	V	E	R	T	A	
J-TD-26	Robert Balisdell, Ph.D		17-Sep-07	Clearly some other States have done more to address these issues	D		S						

Toxics By Accident

Number	Name	Organization/Cor	Date Posted	Topic	Category(ies)							
J-TA-1	Allan Griff	Consulting Engineer	15-Jun-07	environmental advantages provided by plastics								
J-TA-2	Ann		20-Jun-07	We are killing ourselves with too many chemicals in combination.								
J-TA-3	Doug Schoon		21-Jun-07	properly define "toxic" and "non-toxic"					E			
J-TA-4	Frank Teng		26-Jun-07	The Silicon Valley Leadership Group			S	V	E			
J-TA-5	Scott Harvey		27-Jun-07	Executive Order S-20-04				V			T	
J-TA-6	Heather Gladney		27-Jun-07	I agree strongly with Frank Teng's comments here		I	S	V	E	R		
J-TA-7	Sue Tracy		29-Jun-07	Green Chemistry Initiative Stakeholder Meeting that caught my attention.								
J-TA-8	Art Unger		15-Jul-07	fee to cosmetics, batteries, medicines etc.			S					
J-TA-9	Rachael Paulson		18-Jul-07	connection to the earth and land and really do care.					E			
J-TA-10	Martin Lott		22-Aug-07	The tools are out there	D			V			T	A
J-TA-11	Green Chemistry Team		30-Aug-07	The Green Chemistry Initiative held a public stakeholder meeting	D	I	S	V	E	R	T	A
J-TA-12	Jay Schreider		10-Sep-07	I submit the following ideas to be considered as options	D		S		E		T	

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
F-C2C-1	<p>Cradle to Cradle: Through product design and industrial innovation, produce products that reduce the use of harmful chemicals, thus generating fewer emissions and less waste. How do you think California should move to a Cradle to Cradle framework?</p> <p>California needs to carefully review and identify with stakeholders the current significant barriers that impede investment in, and adoption of, sustainable technologies. Although the long-term economic benefits of sustainable technologies, such as reduced regulatory and waste disposal costs, can be significant, businesses can be placed at a near-term competitive disadvantage because of potentially prohibitive, up-front costs. Regulations need to be revised to allow flexibility for the superior environmental performance obtained when clean technologies are employed.</p> <p>To effectively address this dilemma, ACS believes that governments should provide incentives for the implementation of sustainable technologies, as explained further by our answer to the green chemistry question.</p>
F-C2C-2	<p>Industrial cleaning product constituent chemicals have a wide spectrum of potential effects on human health and the environment. Manufacturer employee, product user, and cleaned building resident exposures potentially encompass both acute and chronic health risks. Selected products and processes also manifest safety risks (e.g., fire, explosion, incompatibilities). Constituents may additionally pollute air, water and soil. Everyone gains when historic industrial and household cleaners are cost effectively replaced with “green” products and manufacturing processes that have passed quantitative, objective, and comprehensive assessments.</p> <p>Customization of the Chemical Compliance Systems, Inc. (CCS) “Green” Process Compliance Analytical System (G-PACS) and their “Green” Product Compliance Analytical System (GP-CAS) enables the Chlorine Free Products Association (CFPA) to utilize the “Green” Cleaning Product Process Analytical Compliance System (GCP-PACS) in conjunction with the third party accountability services of our Sustainable Manufacturing Initiative (SMI) on-site audits. Those facilities that complete the SMI with GCP-PACS are then offered access to the on-line, automated “Green” Cleaning Product Compliance Analytical System (GCP-CAS) to provide a complete, comprehensive, cleaning product assessment within 5-10 seconds. Both systems utilize over 40 ecological, health and safety criteria for each chemical constituent. The process, or product, is quantitatively rated on a scale of 0 (worst green) to 100 (best green) for easy manufacturing, or acquisition, assessment against pass/fail criteria, or comparison of competitor products. Compromising product hazards and offending constituents are also quantitatively identified. Both GCP-PACS and GCP-CAS include alternative constituent databases in their process/product Design modes that greatly streamline selection of less hazardous constituents to replace more harmful ingredients. This latter feature greatly facilitates “green” cleaning product and process research and development by rapidly calculating product, or process, “green” ratings as alternative constituents are theoretically inserted for compromising ingredients. Cleaning product or process constituent impacts on over 100 state, federal, international and other third party regulations are simultaneously assessed. GCP-CAS and GCP-PACS represent the first standardized, Web-based analytical compliance capabilities for quantitatively certifying the “greenness” of industrial cleaning products and processes by an independent third party. CFPA recommends that California consider these CCS capabilities as options for achieving the objectives of the California Green Chemistry Initiative.</p>
F-C2C-3	<p>In developing a cradle to cradle system, biomass chemistry will obviously be important. The State of California needs to invest in a research program to identify how biomass resources – ranging from agricultural products like corn to cellulosic matter – may be used in chemistry. In many ways, biomass chemistry may be more feasible than using biofuels on a large scale to provide transportation fuels, because of the much smaller volumes of feedstock needed. Yet, all the societal, ecological, and policy problems associated with biofuel production will apply to biomass chemistry. The State of California needs to take a precautionary approach and begin developing policies to address the impacts of biomass chemistry.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
F-C2C-4	<p>Thank you for soliciting input from California residents concerning the Green Chemistry Initiative. I am currently writing a book-length narrative about environmental illness (including one fictional character based on Dr. John Balmes, who was extremely helpful to me when I first became chemically sensitive), and I would love to contribute my insights to your project.</p> <p>The REACH program currently underway in the E. U. would be a wonderful model for California. In addition to this, however, we need to zero in on those toxins to which the general public is being heavily exposed on a daily basis. At the top of this list is secondhand cigarette smoke. Twenty-one years ago, Surgeon General C. Everett Koop concluded that secondhand smoke causes disease. Twenty years later, Surgeon General Richard Carmona called secondhand smoke an alarming public health threat, "a serious health hazard at any level" One and a half years ago, the State of California's Air Resources Board defined secondhand smoke as "toxic." So what are we waiting for? Who are we afraid of? ...more</p> <p>on behalf of Trudy Fisher</p>
F-C2C-5	<p>November 16, 2007 Maureen Gorsen Director Department of Toxics Substances Control PO Box 806 Sacramento CA 95812-0806 Dear Ms. Gorsen-</p> <p>On behalf of my environmental organization Heal the Bay, and the public-private partnership of the Education and the Environment Initiative, I express strong support for the Green Chemistry Initiative. Clearly, the current structure by which we regulate chemicals in California is not sustainable. Given that California has serious pollution, ecosystem degradation, and natural resource scarcity concerns, it is imperative that the state develop a more cradle-to-cradle approach. The Department of Toxics Substances Control's (DTSC's) leadership is essential to create such a new policy and regulatory framework. Green Chemistry will better enable California to protect people, and the environment, as well as economically keep pace with changes worldwide, and here at home.</p> <p>Educate about the environment is fundamentally critical to any such new Green Chemistry policy and attendant programs. Education is necessary in order to scientifically inform such a policy, practically and efficiently implement it, and also to disseminate information about it to future generations. Luckily, California is currently poised to lead the nation in environmental literacy: the Education and the Environment Initiative (EEI) is a landmark environmental education law that requires the development and implementation of multi-disciplinary environmental education curricula in all disciplines (science, history/social science, English/language arts, and mathematics) for all K-12 grade students in state public schools. The EEI was co-authored by environmental organization Heal the Bay and signed into law in 2003 by former California Governor Gray Davis. In 2005, Governor Schwarzenegger allocated state funds over two years for environmental education curricula development under the EEI. A national model, the EEI will ultimately allow six million California school children each year to have the information they need to make informed decisions about protecting their health and our precious natural resources.</p> <p>As currently being developed, the EEI will necessarily include information that touches on green chemistry specifically. For example, EEI statutory mandates specifically call for the EEI curricula to address topic areas such as "toxics and hazardous waste," "public health and the environment," "pollution prevention," and "environmental sustainability." Obviously, there is significant overlap between the educational mandate of the EEI and the subject matter and goals of any state Green Chemistry Policy.</p> <p>We therefore encourage DTSC to make sure there is full integration between the EEI curricula development and its implementation, and the Green</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>Chemistry policy and program development (including, but not, limited to K-12, post-secondary, and vocational educational efforts associated with Green Chemistry.) To date, DTSC has been very supportive of the EEI effort, and we gratefully applaud their leadership in this regard. We hope that as the Green Chemistry policy unfolds, that DTSC will continue to closely coordinate with the EEI and share Green Chemistry educational content, potential outreach opportunities, and other resources. Together, we can help children learn about environmental issues and make informed decisions about their individual impact on the environment.</p> <p>Sincerely, Leslie Tamminen Legislative Director/EEI Director Heal the Bay</p>
F-C2C-6	<p>The California Association of RV Parks and Campgrounds (CalARVC) requests that the Department of Toxic Substance Control prohibit the import, sale, or use of certain RV toilet additives as part of the California Green Chemistry Initiative. Many of these products are detrimental to onsite septic systems and often cause systems to fail and pollute surrounding soil and groundwater. CalARVC, which is comprised mainly of hundreds of small "mom and pop" RV parks and campgrounds from all over the state, has been seeking a solution for this problem to several years. CalARVC believes the best solution is to ban the sale and use of deleterious products that contain formaldehyde or similar biocides. Most of the toilet additive products sold and used in California contain formaldehyde or a derivative of formaldehyde. These products help dissolve toilet paper and bio-solids and are used by RV owners to prevent odors and blockages in their toilet systems. However, the chemicals in these products that help dissolve toilet paper and bio-solids also kill natural biological organisms used in many onsite wastewater systems. Many onsite wastewater treatment systems use natural organism to breakdown bio-solids and toilet paper. Thus, when RV holding tanks containing certain RV toilet additives are dumped into an onsite wastewater system, which is a common everyday occurrence at RV parks, the chemicals designed to eliminate odors and dissolve toilet waste also kill off the natural organisms causing the onsite septic systems to fail....more</p> <p>on behalf of California Association of RV Parks and Campgrounds</p>
F-C2C-7	<p>On behalf of Johnson & Johnson and its family of companies, I appreciate the opportunity to provide additional comments on the California Green Chemistry Initiative. Johnson & Johnson has identified a number of key policy points regarding green chemistry that we believe are important guidelines that will lead to the overall success of California's Green Chemistry Initiative. Johnson & Johnson recommends specific policy points should be structured around the following policy goals and objectives:</p> <p>on behalf of Johnson & Johnson</p>
F-C2C-8	<p>Green Chemistry in California – Initial Policy Elements Proposed by the Silicon Valley Leadership Group (These comments have been posted to all four discussion forums in the same form, due to overlap in topics.) The Silicon Valley Leadership Group advocates a comprehensive, integrated approach to expanding Green Chemistry in California. By highlighting leaders in the corporate environmental practices and encouraging those who are further behind, we can all move ahead. We envision Green Chemistry as an interactive, evolving partnership with industry, government and consumers working together to protect human health and promote a cleaner, safer environment. Leadership Group members involved in crafting these initial suggestions include those from the electronics, biotechnology, pharmaceutical, chemical manufacturing, and supporting sectors. For more information about the Leadership Group please visit www.svlg.net.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>The Leadership Group proposes the following policy elements to further Green Chemistry in California:</p> <ol style="list-style-type: none"> 1. Strengthen the recognition and pursuit of Green Chemistry processes and products by establishing clear criteria and voluntary certification based on comprehensive lifecycle considerations. Equally important, consumers need to be educated about responsible choices and practices. 2. Explore models other than, or building upon, the current Materials Safety Data Sheet (MSDS) system to provide needed chemical hazard data throughout the supply chain. 3. Establish a Green Chemistry Coordination Council to collect and promote the sharing of information, highlight businesses with green practices, provide assistance to businesses lacking resources, and educate consumers. 4. Prioritize chemicals for screening, testing and appropriate restrictions. We suggest building upon the model of Canada's analysis and prioritization as well as the Proposition 65 review process conducted by OEHHA. Chemicals of high concern should be allowed for targeted, low-exposure uses as determined in an open process by DTSC. 5. Greater investment in pollution prevention in the short term as well as extension of the current CA Pollution Prevention model to downstream chemical users as an element of the long term Green Chemistry strategy. 6. Continue the Conversation with California to sustain progress in Green Chemistry. The dialogue between DTSC and stakeholders has been very helpful and will result in more well-developed, effective policy. <p>IN MORE DETAIL:</p> <p>1) Issue: Our market economy and the innovations that it engenders, environmental and otherwise, are driven by the relationship between industry and consumers. In order for industry to offer products that are environmentally-sound, and for consumers to recognize them, clear and stakeholder-driven criteria are necessary.</p> <p>Proposal: The Leadership Group proposes we strengthen the recognition and pursuit of Green Chemistry processes and products by establishing clear criteria and voluntary certification based on comprehensive lifecycle considerations. Equally important, consumers need to be educated about responsible choices and practices.</p> <p>While the focus of the Initiative has been on chemical safety, green chemistry in the broader sense should incorporate an accounting of embedded energy, CO2 impact, water usage, packaging, recyclability and so forth. Industry on the whole is already moving toward a greater consideration of these factors in our practices. The difficulty of quantifying and ascribing relative importance to these factors points to the need for commonly-held practices or industry standards.</p> <p>A voluntary certification program for green chemistry processes and products will clarify goals for industry members while empowering consumers with the information they need to make informed choices. As green chemistry practices evolve, according to the green chemistry principles we are so well aware of, so should the criteria - we should build flexibility into the system. It is important to note that a voluntary system is more pragmatic than standards at this point, given the innovative and often resource intensive approaches that will be required, the longer timeline necessary for industry transformation, and the need for consumers to have choices. As with organic food, not every consumer wants the environmentally-sensitive approach, if it costs more. The International Standards Organization (ISO) 14001 process certification and ACC's Responsible Care Management Practices are good examples to build upon.</p> <p>It is also important to note that potential green chemistry certification should be a recognition of process in addition to the product. As many experts in the DTSC Symposia have remarked, we are not only trying to improve products, but the entire system that goes into making that product. And we should realize that perfection will not be immediate, but evolve over time. In order to motivate voluntary certification some type of incentive, especially market mechanism such as rebate, tax incentive, or fee refund, should be explored.</p> <p>We understand very well that the consumer wants environmental accountability. As consumers gain in accountability, though, so should they gain in</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>responsibility. This is in no way a proposal to allow industry to abdicate its responsibility for the safer use of chemicals, but rather to acknowledge that in a market-based society, corporate and consumer responsibility must closely intertwine to be successful. Beyond making informed purchases, we can best protect the environment when consumers understand Green Chemistry applies to them as well. How they collectively handle chemical products has an enormous effect (for example, nail polish remover can be easily poured down a household sink which would not be allowed in the workplace). The Green Chemistry Coordination Council described in the third point below could assist in consumer education.</p> <p>2) Issue: The MSDS provides insufficient data on chemical hazards to those downstream in the supply chain. Proposal: The Leadership Group proposes the DTSC explore models other than, or building upon, the current Materials Safety Data Sheet (MSDS) system to provide needed chemical hazard data throughout the supply chain. Our members often find the data included on the Material Safety Data Sheet (MSDS) to be insufficient for determining chemical hazards. Many times important information is addressed in a superficial, boiler-plate fashion or missing altogether. The same raw material from different suppliers may have divergent information. This is in part due to some government regulations requiring that an MSDS be obtained directly from the manufacturer. While we recognize that confidential business information needs to be protected, best possible data on hazard and ecological effects should be made readily available to the supply chain and other stakeholders. In order to meet customer information requirements on chemicals in products, some electronics manufacturers currently must request additional information from upstream suppliers. Instead of doing this on a case by case basis, and in some cases taking the costly approach of reverse-engineering products to determine content, it would be more cost-effective to make raw materials hazard information available further upstream. One approach that could facilitate the sharing of information could be to use the existing MSDS system as a vehicle. More uniform information availability, through approaches such as the ANSI standard for a 16-section MSDS or the IPC 1752 could be an improvement. However, since the MSDS was originally intended to provide more immediate emergency response and use information, it might be best to explore other options such as an MSDS addendum, focused on hazard data. As both REACH and industry efforts such as the Global Product Stewardship initiative make available this data over a 4-10 year timeframe, it is important to recognize that generating this hazard data will take time. A voluntary certification process, with recognition for particularly thorough MSDS's, could also improve the quality of information while allowing chemicals manufacturers to differentiate their products. The Global Harmonization System for the Classification and Labeling of Chemicals (GHS) should be considered, as well. Any model chosen should include the appropriate ecological as well as toxicological information. We also recommend that early stage R&D chemicals be exempted due to their limited use and limited exposures. Worker exposure issues involving recognized hazards (mostly in small/medium enterprises) during the Conversation with California suggests that incorporating MSDS information into real-life practices may be an issue, aside from content. Technical Assistance for those less familiar with critical MSDS information is included as part of the Green Chemistry Coordination Council described below.</p> <p>3) Issue: Some companies and industries have already made much progress in achieving the aims of Green Chemistry while others lag behind. Green Chemistry involves myriad innovations and the collection and processing of much information. We do not have an adequate way of sharing Green Chemistry practices nor have we made the investment to encourage and reward green efforts. Proposal: The Leadership Group proposes the establishment of a Green Chemistry Coordination Council to collect and promote the sharing of information, highlight businesses with green practices, provide assistance to businesses lacking resources, and educate consumers. The information presented by the speakers, panelists, and stakeholders during the past year of effort on this Initiative has been incredibly thorough, enlightening, and inspiring for all stakeholders. We suggest the DTSC catalog and make easily available information regarding best practice screening processes, green chemical design, collaborative efforts such as the ACS Green Chemistry Institute, and international efforts such as the Global</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>Harmonization System. All stakeholders still have a lot to learn in this dynamic area, and everyone stands to gain from continued information sharing. DTSC's leadership in this area should be continued by establishing it as a central clearinghouse of information for the state and beyond. Many medium and small companies are lacking in appropriate knowledge and resources, and will need assistance in taking advantage of Green Chemistry practices. Providing incentives for the sharing of data and best practices will help all companies. We further suggest building upon and making readily available the information provided by existing efforts: ACS Green Chemistry Institute, Cleangredients, U.S. EPA's Design for Environment Program, Performance Track, the chemical industry's HPV testing program, eChemPortal, EPEAT, and DTSC Technical Resource Center.</p> <p>4) Issue: California has limited resources to evaluate chemicals for restriction. Chemical safety is a measure of exposure as well as toxicity. While we need to carefully assess and restrict the use of chemicals of concern, complete bans fail to allow for appropriate and beneficial uses. Proposal: The Leadership Group proposes the DTSC prioritize chemicals for screening, testing and appropriate restrictions. We suggest building upon the model of Canada's analysis and prioritization as well as the Proposition 65 review process conducted by OEHHA. Chemicals of high concern should be allowed for targeted, low-exposure uses as determined in an open process by DTSC. The DTSC, together with other relevant State agencies, needs to establish clear and consistent science-based protocols for screening and testing. These should include determination of endpoints of concern and modes of action, where scientific and methodological questions are sufficiently advanced to enable consistently sound science-based judgments of potential risk. The use of a transparent and rigorous process to evaluate risk factors as indicated by toxicological, epidemiological, and exposure data will allow us to compare the relative importance and safety of chemicals as well as determine whether any restrictions or substitutions are appropriate. A scientific panel of experts with a range of theoretical and applied chemicals experience can best establish and oversee a process acceptable to all stakeholders. The Proposition 65 review process may offer a starting point for development of a thorough, scientific process to meet these broader needs. Government entities around the world have been or are in the process of revamping their chemicals use policies. Although the DTSC will need to analyze the individual needs of our state through such means as chemical mapping, we should coordinate with the chemicals policies of other countries to minimize confusion, cost and competitive impacts. Starting with the thorough screening done by Canada's Environmental Policy Act (CEPA) would allow us to build upon their scientific knowledge base and mitigate the burden of data gathering. Any proposed restrictions or mandates should be targeted and include careful evaluation of alternatives. This targeted approach will allow us to concentrate our resources where most needed. Furthermore, any mandates should be harmonized with systems in other countries as much as possible. While we wish it were not necessary to use chemicals determined by such scientific protocols to be of high concern, many times they are needed to promote human health or advance ground-breaking research. This is the uncomfortable irony with which we will have to live until we find better alternatives. In the meantime, targeted use of these chemicals under highly controlled and low-exposure scenarios should be allowed by DTSC, after an open, scientifically based stakeholder process. In the absence of safer alternatives, which should be technically feasible, improve health/safety/environmental profile, be of comparable or superior performance, cost-effective, and be capable of persistence, banning should be avoided. In that case, resources should be devoted to R&D or incentives should be provided to develop cost-effective alternatives. Our goal should be a marketplace where informed decision making at both the manufacturing and consumer levels is consistently delivering changes/substitutions that advance our collective interests along the dimensions outlined above. We recommend that novel R&D chemicals, used in relatively tiny amounts in highly controlled settings, be excluded from any consideration of a restriction or mandate. There are rarely, if ever, exposures outside of the laboratory. Government oversight of these chemicals would not be cost-effective and would be counterproductive to the aims of Green Chemistry. Flexibility in this type of research chemical use promotes the innovation of safer chemicals and processes. Both CEPA and REACH exempt these chemical uses. Exemptions should also be allowed for select pilot demonstrations and testing.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>5) Issue: It will take a significant amount of time for industry and consumers to move to Greener Chemistry and we need to address pollution concerns in the meantime. Existing efforts at pollution prevention in the state utilize a collaborative model that has proven effective, but has been limited by its modest resource commitment and its narrow manufacturing focus.</p> <p>Proposal: The Leadership Group proposes greater investment in pollution prevention in the short term as well as extension of the current CA Pollution Prevention model to downstream chemical users as an element of the long term Green Chemistry strategy.</p> <p>Pollution prevention programs and policies such as SB 14 have been promoted for quite some time, yet they never receive anywhere near adequate funding and attention. We need to increase our investment in pollution prevention assistance, especially for medium and small businesses that either lack the resources or motivation to tackle the problem on their own. Since pollution prevention has led to demonstrated improvements and optimization of chemical processes, it is a critical, complementary approach to Green Chemistry's goals of better chemical design.</p> <p>The model of collaboration between companies, the DTSC and third party experts (in the case of the SB 14 program, from the University of California), may also offer a model applicable to a broader Green Chemistry strategy. The impressive accomplishments of the Institute for Research and Technical Assistance in enabling development of substitutes for problem solvents in various applications suggest that such targeted 3rd party collaboration may pay dividends in products/product use as well as in manufacturing. This suggests the possibility of 1) taking chemicals of top priority concern, 2) identifying the specific applications or industry uses posing the greatest risk from those chemicals, and 3) applying a collaborative process of agency, industry and third-party experts to identify or develop viable alternatives that can maintain efficacy, but reduce risk in those targeted applications.</p> <p>6) Issue: The stakeholder process for developing Green Chemistry has provided much more comprehensive progress than could have been achieved otherwise.</p> <p>Proposal: The Leadership Group proposes we continue the Conversation with California to sustain Green Chemistry progress. The dialogue between DTSC and stakeholders has been very helpful and will result in more well-developed, effective policy.</p> <p>We commend the DTSC for encouraging creativity in finding safer alternatives and providing opportunities for open-ended discussion. There remains, though, a very real need for extensive further discussion by the stakeholders in this Green Chemistry Initiative. We hope that the inclusive nature of this process is not at an end. There are so many pieces to Green Chemistry and as the focus narrows to various subtopics, meaningful stakeholder participation will be essential. We have all built personal relationships and broadened our understanding of the various points of view. It would be a shame to toss this hard-won experience aside.</p>
F-C2C-9	<p>The Western States Petroleum Association (WSPA) is pleased to offer the following comments on policy options being considered in the context of Cal-EPA's Green Chemistry Initiative. Many of the comments submitted to DTSC to date and debated in public forums refer to the need for California to supplement the requirements of the Federal Toxic Substances Control Act (TSCA).</p> <p>Prior to immediately moving in this direction, WSPA believes that DTSC must evaluate what regulations and information are currently available and whether these tools are being appropriately implemented and applied prior to developing new programs. Indeed, we expect this analysis is already underway, pursuant to the mandate to conduct a "baseline assessment" of existing programs and information described in the April 20 memorandum from Cal-EPA Secretary Linda Adams announcing the Green Chemistry Initiative.</p> <p>We further expect that this analysis will be presented to Initiative stakeholders for review and comment along with the policy options that flow from it, to ensure that all relevant information has been considered, including information obtained from national and international programs. We are optimistic that this approach will lead to meaningful improvements in existing state programs.</p> <p>on behalf of Western States Petroleum Association</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
F-C2C-10	<p>I am a resident of Ojai, California, and am concerned about the safety of many of the products we use from toxic chemicals in them - mostly food, but also pharmaceuticals, cleaners, etc.</p> <p>I have learned about the Green Chemistry Initiative which provides an opportunity to protect California by acting to restrict or eliminate especially dangerous substances and by mandating safer alternatives. This is a wonderful idea and I heartily endorse it. However, I really encourage you to ensure that in addition to incentive programs, the Initiative implements protective regulations, including restrictions and bans of chemicals for which the weight of evidence demonstrates a severe hazard to human health and/or the environment.</p> <p>Many thanks for considering this suggestion.</p> <p>on behalf of Walter M. McClelland</p>
F-C2C-11	<p>I am in support of the Green Chemistry Initiative to restrict or eliminate dangerous substances in California. We are being exposed to far too many chemicals in our daily environment and many of us are getting sick. It is especially necessary to get them out of commercial cleaning products that are used everywhere, from stores to doctor's offices and even hospitals! We need some strict regulation on use of harmful chemicals that in many cases can simply be replaced by less or non toxic ones. This is a critical situation which requires regulations to test chemicals and ban those shown to be a hazard to our health and well being.</p> <p>Please reply too: Diane Brodd</p> <p>on behalf of Diane Brodd</p>
F-C2C-12	<p>I would like to add my support of the Green Chemistry Initiative to restrict or eliminate dangerous substances in California I would like to see this initiative include the problem of chemicals being used in our daily lives that have not been tested for neurotoxicity in children. I urge you to include restrictions and bans on chemicals that demonstrate a hazard to our health and/or environment.</p> <p>This is a critical situation that requires immediate attention by not only providing incentive programs but requiring restrictions and bans on those chemicals that are potentially dangerous.</p> <p>Please reply too: Linda Blackwell</p> <p>on behalf of Linda Blackwell</p>
F-C2C-13	<p>Dear Director Gorsen:</p> <p>The Consumer Specialty Products Association (CSPA) has appreciated your continual efforts to include us in the discussions and stakeholder input on the Department of Toxic Substances Control (DTSC) California Green Chemistry Initiative. We also appreciate this opportunity to provide supplemental comments in addition to the information that we have provided on the "Conversation with California" website.</p> <p>CSPA is a national nonprofit trade association that represents more than 260 companies engaged in the formulation, manufacture, distribution and sale of consumer, institutional and commercial products. CSPA member companies manufacture and market a wide range of products, including: cleaning products, disinfectants and sanitizers, candles and air care products, household pesticide products, automotive products used to clean and maintain vehicles, and polishes and floor maintenance products.</p> <p>CSPA members are committed to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers. CSPA and our members support the broad goals of the Green Chemistry Initiative and look forward to</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>working with DTSC and other stakeholders in the state to help spur green chemical innovation and ensure that products are safe.</p> <p>I. Background CSPA member products improve the quality of human life and are necessary to protect the public health against dangerous diseases, infestation, and unsanitary conditions. CSPA members are committed to providing products that are thoroughly evaluated for human and environmental safety and go through rigorous safety-based assessments before they are brought to market. CSPA members are also committed to clear and meaningful labeling on consumer products, i.e., label instructions are written to ensure that consumers use products in accordance with label instructions. Finally, CSPA members are committed to the development of green products that are safe for human health and the environment. In addition, CSPA members routinely apply green chemistry and green engineering principles in their operations and have been honored with awards for their efforts. The consumer products industry develops products that meet or exceed safety requirements of all state and federal agencies in the United States and Canada charged with regulating those products, including the California Department of Pesticide Regulation, the California Air resources Board, and other state agencies, U.S. Consumer Product Safety Commission (CPSC), the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the U.S. Food and Drug Administration (FDA), Health Canada, and Environment Canada. While we support the California Green Chemistry Initiative and believe there is much that can be done to address and spur the development of green chemical technology, CSPA believes that regulation of our members' products under current federal and state regulatory authorities provides safety and protection to consumers. Below is a short summary of the various regulatory authorities that ensure the safety of consumer products and their ingredients. While it is not an exhaustive list of the regulatory requirements these products undergo, it illustrates the extensive oversight that already surrounds the manufacturing and marketing of consumer specialty products.</p> <p>II. Toxic Substances Control Act (TSCA) The Toxic Substances Control Act (TSCA) gives EPA the authority to regulate chemicals produced or imported into the United States. EPA repeatedly screens these chemicals and can require reporting, testing or a complete ban of those that may pose an environmental or human-health hazard. Any person intending to manufacture or import a chemical substance first must determine whether the substance is listed on the TSCA Inventory. If it is not listed, the prospective manufacturer or importer must satisfy premanufacturing notice (PMN) requirements before commencing production or importation of the substance. In filing a PMN, the manufacturer or importer must give their identity, specific chemical identity, product volume, use, exposures (worker, user and consumer), and environmental fate. Additionally, any test data relating to environmental or health effects of manufacturing, processing, distributing, using, or disposing of the new chemical substance must also be submitted. The PMN must be filed at least 90 days prior to the commencement of commercial production or importation of a new chemical substance. EPA's review of a PMN consists of seven major stages designed to ensure that EPA examines all aspects of a new chemical, including its physical and chemical properties, potential toxicity, exposure of workers, users and consumers, and economic benefits. EPA has the authority to prevent, delay, or limit manufacture after the initial PMN review period ends. EPA can issue an administrative order regulating a new chemical substance if the Agency finds that there is insufficient information to reasonably evaluate the risk and either the chemical may present an unreasonable risk to health or the environment or it will be produced in substantial quantities with the result that either substantial quantities will enter the environment or there will be substantial or significant human exposure to the substance. While EPA does not require a designated set of toxicity testing to be included in the PMN submissions, it has identified several categories of chemicals and the concerns areas where it has required such tests. Under these requirements a company must provide information addressing these risk concerns or face restrictions based on default assumptions. EPA has broad authority to regulate the existing chemicals in commerce as well. If a chemical presents unreasonable risks to health or the environment, EPA must initiate a rule-making to regulate the chemical. As of 2007, EPA has issued over 1300 Significant New Use Rules, which restrict the manufacture, import, or processing of a substance . EPA can prohibit or limit the manufacture, processing, distribution, commercial use or disposal of the chemical; prohibit or limit the use of the chemical</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>in a concentration above a specified level; require adequate warnings and instructions with respect to the chemical's use, distribution in commerce or disposal; require record-keeping; prohibit or regulate disposal of the chemical; and require notification to the purchasers or the general public about the risks involved and to replace or repurchase a chemical substance or mixture if requested. EPA also has the authority under TSCA to require manufacturers of substances to develop safety and environmental data.</p> <p>III. Consumer Product Safety Act (CPSA) The Consumer Product Safety Act (CPSA) provides that when the Consumer Products Safety Commission (CPSC) finds an unreasonable risk of injury associated with a consumer product it can develop a standard to reduce or eliminate the risk. The CPSA also provides the authority to ban a product if there is no feasible standard, and it gives CPSC authority to pursue recalls for products that present a substantial product hazard. The CPSC is authorized to set safety standards as to consumer product performance, composition, contents, design, construction, finish, packaging and labeling. In general, the manufacturer of a consumer product subject to regulation must issue a certificate announcing compliance with the applicable standards, and must label the product with the date and place of manufacture, the identity of the manufacturer, a certification of compliance with any applicable rule, and a brief description of such rule. Manufacturers are required to immediately notify the CPSC if it obtains information which reasonably supports the conclusion that a product: (1) fails to comply with a consumer product safety standard or banning regulation or a voluntary consumer product safety standard upon which the CPSC has relied upon; (2) contains a defect which could create a substantial product hazard described in the CPSA; or (3) creates an unreasonable risk of serious injury or death. In the last ten years, CPSC obtained 472 voluntary recalls involving 110 million product units. During this time, CPSC obtained 1031 corrective actions (including recalls and other actions to keep unsafe products from consumers).</p> <p>IV. Federal Hazardous Substances Act (FHSA) The Federal Hazardous Substances Act (FHSA) requires labeling of hazardous substances sold to households. It prohibits the sale or introduction into interstate commerce any product which does not comply with the regulations. FHSA regulations provide specific guidelines to determine potential risks specific to the entire formulation and package. Product risk assessments are the basis for label decisions and precautionary label text to protect consumers and children. At a minimum, labels must include hazard signal word, affirmative statement of hazards, the name of each component that contributes to the hazard, and precautionary measures to be taken to avoid risk, required or appropriate instruction for first aid treatment, handling instructions, storage instructions, and "Keep out of reach of children."</p> <p>V. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) provides the basis for regulation, sale, distribution and use of pesticides in the U.S. FIFRA authorizes EPA to review and register pesticides for the specified use which a registrant applies for. Before registering a new pesticide or new use for a registered pesticide, EPA must first ensure that the pesticide, when used according to label directions, can be used with a reasonable certainty of no harm to human health and without posing unreasonable risks to the environment. To make such determinations, EPA requires more than 100 different scientific studies and tests for active ingredients. In fact, EPA has banned and severely restricted 64 pesticides in the United States. When EPA registers a pesticide, it approves the product's label, which includes (among other things) directions for use, hazard warnings, and precautions. It is a violation of FIFRA for any person to use a pesticide in a manner inconsistent with its EPA-approved labeling. EPA also has the authority to suspend or cancel the registration of a pesticide if subsequent information shows that continued use would pose unreasonable risks to health or the environment. EPA may decide to remove a pesticide from the market based on information from a variety of sources: new studies conducted by the registrant, the Government, or a third party; incident information submitted by a registrant; or results of the EPA's periodic review of pesticides and tolerances.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>EPA is currently completing a review of those pesticides registered before November 1984 to ensure that they meet current scientific and regulatory standards. This process, called reregistration, considers the human health and ecological effects of pesticides and results in actions to reduce risks that are of concern. Concurrently, EPA has begun a registration review process for those products registered subsequent to 1984 and for those pesticides that were review under the reregistration process previously. These ongoing review processes assure the continual reexamination of the safety and environmental profile of pesticides.</p> <p>EPA and the states enforce FIFRA primarily through stop sale, use, and removal orders, civil penalties, or a combination of the two. Unlawful acts under FIFRA include: selling an unregistered or misbranded pesticide; selling a pesticide whose composition differs from the one described in the pesticide's registration application, violating EPA's labeling requirements, failing to file annual production reports, and violating FIFRA's export requirements.</p> <p>VI. Recommendations for Product Stewardship & Safety-based Assessments</p> <p>As stated in our November 6 "Conversation with California" entry, CSPA supports company performed safety-based assessments of consumer products prior to the marketing of a product, that take into consideration all of the phases of a product's life-cycle. CSPA also supports appropriate use-restrictions for chemical ingredients when scientific safety-based assessments indicate that they cannot be used safely in a consumer product or use application. CSPA and our members believe that every responsible company should be performing these types of safety-based assessments and supports initiatives that recognize companies for these types of procedures.</p> <p>In fact, CSPA has demonstrated our industry's commitment to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers, when we initiated our Product Care program in 2001.</p> <p>CSPA's Product Care program is a stewardship program for the consumer and institutional specialty products industry where participating companies have agreed to go beyond government regulations in emphasizing health, safety and environmental concerns by carefully designing products, purchasing raw material and packaging, operating safe manufacturing facilities, promoting safe storage and distribution, providing useful product information, answering consumers questions and anticipating product disposal needs. CSPA believes that these types of product stewardship programs should be considered as frameworks for programs developed under the Green Chemistry Initiative.</p> <p>Product Care provides a framework for companies to identify and commit to stewardship principles, share ideas and information and benchmark better performance. Participating companies have pledged to develop management principles for each of seven areas in a product's life cycle from development in a research facility through product use and disposal. Through this program Companies Must Commit to Evaluate:</p> <ol style="list-style-type: none"> 1. Product Design 2. Raw Material, Package and Service Supply 3. Manufacture and Production Site Management 4. Product Storage and Distribution 5. In-market Support, Incident Evaluation and Follow-up 6. Consumer Education and Outreach 7. Product Disposal <p>Stewardship did not begin when CSPA's Product Care program was initiated in 2001. Responsible companies have long followed policies promoting safe products that provide important health benefits while not adversely affecting the environment.</p> <p>CSPA believes it is vital that these types of product stewardship programs and companies that participate in these programs be recognized and fostered through any program developed under the Green Chemistry Initiative. In particular, CSPA believes that DTSC and California can leverage and recognize programs like Product Care as a way of encouraging companies to establish robust procedures to ensure product safety and environmental safety.</p> <p>VII. Recommendations for Chemical Data Development Initiatives</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)

Number	Full Comment
	<p>Chemical data development efforts should build on existing statutory and regulatory structures, voluntary initiatives, and data development efforts. CSPA does not support California-specific data development requirements and pre-market approval process for chemicals or consumer products. However, CSPA supports collaboration by DTSC and California in ongoing work by other government agencies to assess chemicals and consumer products. Specifically, California and DTSC could leverage efforts by Health and Environment Canada in addressing priority chemicals in the Chemicals Management Plan. DTSC and California could collaborate with these agencies on their high priority list and avoid needless duplication of current data development and prioritization efforts. DTSC and California could also participate in the effort launched in August during the Security and Prosperity Partnership (SPP) with under the Montebello Agreement involving trilateral cooperation among the governments of Canada, the United States and Mexico to share chemical information and safety assessments.</p> <p>In addition if DTSC and California move forward with efforts to establish chemical priorities the process should be collaborative and should include scientific experts in toxicity and exposure, chemical manufacturers, consumer product manufacturers, and nongovernmental organizations. CSPA believes inclusion of manufacturers of the chemicals and consumer products could provide toxicity and exposure/use data to determine whether the uses of “priority chemicals” are safe or should be restricted.</p> <p>As referenced above, CSPA does not support pre-market approval of chemicals or consumer products, because this would be an incredibly burdensome and expensive process for the State of California and would unnecessarily slow down the development of products. For example, the Department of Pesticide Regulation registers approximately 12,000 pesticide products sold in the State and in 2005-06 it cost the agency over \$17.5 million to review and approve these products . To require pre-market approval for the hundreds of thousands of chemicals and consumer products in commerce would be cost-prohibitive.</p> <p>VIII. Support for Appropriate Ingredient Disclosure</p> <p>Throughout Green Chemistry discussions and in recent market research consumers and others have expressed a desire to know what ingredients are in the products they use in their everyday life. These consumers are interested in having this knowledge in order to make informed product choices. It may appear that product ingredient information may not be readily available to consumers; however, our members willingly provide information to meet consumer needs. While some organizations have expressed concerns about ingredients in consumer products, much of this information is inaccurate. This is primarily due to the reliance on outdated resources that are dependant on old technologies or on assumptions made by sources that are not well versed in specific product chemistries.</p> <p>CSPA and our members support an appropriate approach to providing accurate information to consumers through ingredient communication. Our industry stands behind the safety of our products and the appropriate use of chemical ingredients in those products. We would like to work with DTSC and the State of California to implement a means of ingredient communication that would provide consumers with the information they can use to make informed decisions regarding the products they use in their homes.</p> <p>IX. Essential Principles for Green Chemistry Initiatives</p> <p>As any Green Chemistry program moves forward, CSPA believes, that in order for the effort to be credible and have a positive impact it must be structured in a way that includes all stakeholders and provides a sound scientific basis for the program. Specifically, Green Chemistry should ensure the safety of chemicals and consumer products through the use of sound science in the decision-making process.</p> <p>Additionally, green chemistry programs should be designed to ensure that products remain technologically and commercially feasible to produce; and that product efficacy, performance, and usability are not compromised or undermined. As such, Green Chemistry must foster innovation and not limit the development of new chemistry technologies.</p> <p>X. Support for Initiatives to Spur Green Innovation</p> <p>Stimulating green chemical innovation has been a core concept of the Green Chemistry Initiative, and discussion of this topic has shown the promise that new technologies have for improving the standard of life in California and reducing environmental impacts. CSPA supports collaborative efforts to</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>encourage public and private partnerships with the goal of developing “greener” products and “environmentally responsible” ingredients rather than mandatory and voluntary state labeling programs that endorse green products or programs that stipulate a single third-party certification of green products.</p> <p>CSPA supports initiatives that provide incentives for companies that innovate and develop technologically and commercially feasible products using green chemistry. CSPA also supports recognition for companies that develop sustainable business operations, processes, and/or products. We also believe there are unique opportunities in California for research that identifies areas for the use of green chemistry in consumer products. Essential elements to ensuring that these technologies become widespread are implementing State policies that are designed to overcome barriers to commercial application of green chemistry research and development efforts.</p> <p>XI. Conclusion</p> <p>Once again, CSPA has appreciated DTSC’s efforts to include all stakeholders in the discussions during the California Green Chemistry Initiative. CSPA believes that the Green Chemistry Initiative holds incredible promise for helping spur green innovation in California. We also believe that the Initiative can leverage ongoing chemical data development initiatives in setting chemical priorities. Further, CSPA believes that DTSC should recognize and encourage the current product stewardship procedures and safety-based assessments that companies perform prior to marketing a consumer product. CSPA would also look forward to working with DTSC and the State of California on an appropriate ingredient information system to help inform consumers when making their purchasing decisions.</p> <p>CSPA looks forward to continuing to work with DTSC through the Green Chemistry Initiative, as recommendations are developed, and CSPA hopes that our continued participation in this discussion will provide meaningful help to the endeavor.</p> <p>Please feel free to contact me directly at (202) 833-7328, or CSPA’s in-state representation, Laurie Nelson at (916) 446-1111 if you have any questions about these comments.</p> <p>Respectfully Submitted, Andrew R Hackman Manager, State Affairs Programs</p>
F-C2C-14	<p>The American Chemistry Council (ACC) is pleased to provide these comments as a final submission to the “Conversation with California” on the Department of Toxic Substances Control’s (DTSC) Green Chemistry Initiative (CGCI). These comments supplement another ACC blog entry today that presents a proposal for DTSC’s consideration (“ACC Proposals for Future Actions Related to California Green Chemistry Initiative”).</p> <p>The CGCI has attempted to address a wide range of issues and approaches to promoting “green chemistry” in California. As we understand it, the input received by DTSC will be used to assess the options that can be presented to “establish the blueprint for keeping California in the forefront of protecting health and the environment in a robust economy. . . [and show that] California is leading the effort to fundamentally change the way it deals with its chemicals and waste.”</p> <p>ACC believes that the overriding objective of the CGCI – “protecting health and the environment in a robust economy” – properly acknowledges that encouraging and sustaining a sound commercial economy is an important basis for “green chemistry.” Indeed, ACC believes that “green chemistry” must be considered first and foremost a way of doing business, not a government mandate. As numerous commentators on green chemistry have acknowledged, green chemistry cannot be legislated, although both green chemistry and green engineering can be promoted and enhanced by appropriate policy decisions.</p> <p>Clearly proposals for additional regulatory requirements and for additional legislative authority may be part of the recommendations made by DTSC to CalEPA by mid-2008. Those proposals, however, should be based on a clear understanding of their objective, the likelihood that the proposals will achieve the objective, the time frame in which they can reasonably be implemented, and the likely positive and negative impact on California, including health, environment, and the economy.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>ACC believes that the largest single challenge for DTSC is bringing coherence to the hundreds of suggestions the Agency has received through the “Conversation with California” and the stakeholder meetings. The volume and breadth of the recommendations reflected in the “emerging options” paper does not, in our view, lead to any clear conclusions. Our comments below on each of the major categories reflected in the “emerging options” document are intended to focus on policy and program options that can be practically and pragmatically implemented, while achieving the overall objective of the CGCI.</p> <p>I. Policy Options</p> <p>The DTSC’s recommendations to CalEPA should be built around a core set of reasonable policy options. A few recommendations have been made that California should adopt a “substitution” policy – a stated policy of forcing the substitution of hazardous chemicals for “less hazardous” alternatives. ACC believes that a substitution policy is impractical at best, and a negative disincentive for technological progress and innovation. “Green Chemistry” is not just about substitution of one hazard for another; it is ultimately about the reduction of risks to health and the environment that are otherwise unmanaged. Indeed, a risk reduction policy seems to ACC to be a much better approach to accounting for the economic, social, health, and environmental dimensions of green chemistry, particularly because by definition it will address not only inherent toxicity (hazard), but potential exposures as well. Perhaps most importantly, a risk reduction policy (one that addresses both hazard and exposure) correlates very well with the pollution prevention policies that have been at the heart of many existing DTSC programs, and can serve as a meaningful focal point in encouraging the development of sustainable chemistry, green engineering, and products that improve the lives of Californians and the State environment. The successful implementation of a risk reduction policy requires a clear articulation of the objective, the various options for reflecting that objective in regulation, legislation, and programs, and the consequences and expected benefits of such a policy. Such an approach would suggest that DTSC needs to define success in this initiative, identify the problems that are in need of a solution, and assess the resources, tools, information, and mechanisms necessary to achieve those goals.</p> <p>ACC believes that California’s primary objective should be the reduction of risks to health and the environment that are otherwise unmanaged or unacceptably under-managed. And to succeed in that objective, California must establish a process by which state-wide priorities can be identified, where existing and new risk reduction measures – spanning the entire spectrum from research and financial incentives to regulation – can be appropriately assessed, and where the relative benefits and impacts of the approach can be evaluated. In short, a risk reduction policy provides an important and appropriate organizing principle for DTSC’s “Green Chemistry” recommendations.</p> <p>II. Legislation/Regulation</p> <p>Any legislative or regulatory proposals emerging from the Green Chemistry Initiative should be oriented toward proposals that support the underlying policy objective of risk reduction. As a practical matter, ACC agrees that chemical specific legislation may not be a practical way of using the State’s resources to address critical risk related issues. For this reason, ACC believes that if DTSC determines that it needs a program specific to California, the key component of the DTSC’s recommendations should be a proposal for a regulatory process that allows DTSC to identify key priorities and take appropriate action on those priorities.</p> <p>We want to be clear – ACC is not recommending that DTSC adopt a comprehensive chemical regulatory program. We believe that there are practical, pragmatic options for California far short of a California version of the federal Toxic Substances Control Act (TSCA), a California version of Europe’s Registration, Evaluation and Authorization of Chemicals (REACH) program, or a California version of Canada’s Chemical Management Plan. Each of those programs has or will produce information that is or will be useful to the State in identifying priority chemical risks that warrant reduction actions, without requiring the significant administrative infrastructure, costs, and burdens associated with a comprehensive chemical regulatory regime.</p> <p>DTSC has an important opportunity to consider how it can promote “green chemistry” by leveraging the significant work already done by many different organizations related to chemicals in commerce. ACC believes that in the vast majority of cases, information on particular chemicals, uses, or exposures is or can be readily available from a number of sources. Well-conceived options for additional regulatory authority should address how</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>California can identify priority risks, appropriate information on manufacturing, import and use, and information on available risk reduction measures. We also want to be clear that if DTSC determines that it needs its own regulatory program specific to California, ACC is recommending that DTSC suggest narrowly drawn regulatory authority that assures that appropriate risk reduction strategies are developed and implemented for key chemical priorities. For example, a number of commentators to the “Conversation with California” have suggested that California needs to have a complete record of all chemicals in California commerce, whether manufactured or imported as discrete chemicals or as components of preparations or articles. ACC believes that such an approach is unrealistic and impractical, particularly given the relative benefit of such a system compared to its costs. Other commentators have made the simplistic suggestion that California should adopt Europe’s REACH system. Those suggestions are made with little knowledge of the REACH legislation and its likely impacts. Few understand that REACH does not begin to operate until June 2008, and that the registration component will not be completed for 11 years. Few understand that the estimated costs of simple registrations and the use-specific licensing component of REACH (authorization) are now three times higher than they were when REACH was first being negotiated. Few understand that REACH does not result in a complete evaluation of all chemicals in commerce. And fewer still comprehend fully just how complex an 850 page regulation, and its more than 4,000 pages of guidance, really is.</p> <p>DTSC must fully understand REACH before it commits to proposing such a regulatory system for the State. On the basis of the “Conversation with California”, however, the debate over REACH in California has been long on rhetoric but short on detail, and it would be premature at best for DTSC to include a REACH recommendation in its options.</p> <p>As ACC has noted in prior submissions, Canada, Mexico, and the United States agreed in August 2007 on a cooperative program to accelerate screening level risk management decisions for chemicals in commerce in North America. The program, commonly referred to as the Montebello Agreement, will result in decisions on a faster pace than REACH. The Montebello commitment is to complete the work by 2012. More importantly, that effort should produce information that California can access and use as the State reviews priority chemicals.</p> <p>III. Compliance and Enforcement</p> <p>DTSC’s “emerging options” document contains several recommendations aimed at compliance and enforcement issues. In general, it will be difficult to enforce broad concepts of “green chemistry,” largely because what constitutes “green chemistry” (or green engineering) will differ depending on the product, process, company, or industry involved. To the extent that regulatory actions are recommended by DTSC, appropriate enforcement measures will likely need to be considered. It is critical that those enforcement measures be capable of uniform application. In addition, ACC believes that California should address what steps might be necessary to deter false claims of “green-ness” that mislead consumers and distort the market.</p> <p>IV. Data/Information</p> <p>As ACC has noted in other “Conversation with California” submissions, California does not need information on each and every chemical in commerce, it needs information on chemicals considered priorities by the State. A number of sources for supporting information already exist, and we urge DTSC to rely on existing information as a first, but necessary, step. Only when potential data gaps are understood can approaches to filling specific data needs be addressed. Many of those sources are already being linked in broader web-based portals, by institutions such as the Organization for Economic Cooperation and Development (OECD). Moreover, those information sources are complemented by data and information provided by industry in programs like the High Production Volume (HPV) Challenge, and the Voluntary Children’s Chemical Evaluation Program (VCCEP).</p> <p>In submissions to the “Conversation with California,” some have suggested requiring extensive new laboratory animal testing, while others have opposed testing altogether. ACC encourages the use of alternatives to animal testing when these alternatives are scientifically valid and predictive and acceptable to regulatory bodies. Furthermore, experience has shown that arraying toxicity tests in a tiered framework, drawing upon standardized study protocols to develop data on toxicologically relevant endpoints for assessing human health hazards, applying this information to groups or series of similar chemical substances provides scientific rigor and at the same time provides flexibility to account for differing chemical toxicities and to address specific concerns associated with existing or anticipated exposures to specific chemicals. In this manner, tiered testing focuses efforts to collect data</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>where it is most needed, promotes screening of the greatest number of prioritized chemicals (or classes of chemicals) and, where indicated by specific toxicity results, indicates which substances pose a particular concern and points to the specific, more complex test that should be considered. Thus, tiered-testing and risk-based approaches are both efficient and effective in protecting human health.</p> <p>ACC also believes that the Montebello Agreement recently concluded by Canada, Mexico, and the United States deserves considerable attention by DTSC. Under the Agreement, the U.S. Environmental Protection Agency has committed to completing screening level risk management decisions on nearly all chemicals in commerce. More importantly, the commitment is to complete those reviews by 2012, thereby providing a basis for identifying chemicals that pose priority health or environmental risks. That information will include both hazard and exposure related information, and will be an important data source that California should rely on. ACC believes that DTSC should not wait for the conclusion of the CGCI to engage in discussions with U.S. EPA and the Canadian government on how the State can coordinate with and leverage those programs in support of the CGCI.</p> <p>Several options outlined in the “emerging options” document suggest that California should adopt a “no data, no market” approach. While the approach may initially seem attractive, the scope of the requirement will obviously determine its potential utility and impact. ACC believes such a requirement implies that California wants all information on all chemicals, and as we have stated earlier, there are significant resource implications from that approach. Perhaps more to the point, for the vast majority of chemicals, such a requirement will have little or no marginal benefit for health and environmental protection. Under the Canadian Chemical Management Program (CMP), for example, some 19,000 chemicals did not meet the criteria used for categorization and do not need further action at this time. A simplistic approach to a “no data, no market” requirement has the potential to require a significant duplication of effort for both the State and the regulated community.</p> <p>V. Education/Outreach</p> <p>ACC concurs with many of the comments reflected in the “emerging options” document on education and outreach about “green chemistry.” There are several dimensions to the education and outreach issues.</p> <p>First, there is a need for education that the broad scope of “green chemistry” includes “green engineering,” and that it is not limited to simplistic hazard substitution. Moreover, a concerted effort to disseminate appropriate information on the accomplishments, best practices, costs, and benefits of “green chemistry” would help assure that all interested stakeholders understand the concept and limitations of the approach. ACC believes that suggestions to require that manufacturers publicly disclose the chemical content of their products could be considered in circumstances where it is clear that proprietary information is not compromised. We have made clear in other submissions to the “Conversation with California” that ACC members believe health and safety information should never be considered proprietary or confidential information.</p> <p>Second, there have been a number of excellent recommendations for enhancing academic curricula, particularly at the post-secondary level, to cover topics related to green chemistry. Expanded training opportunities in toxicology (both human and environmental), exposure assessment, life cycle analysis, and risk assessment make sense.</p> <p>Third, ACC agrees that one option to establish California as a locus of “green chemistry” may be the creation of a separate organization, perhaps one affiliated with the University of California system or other academic institution. However, it should be recognized that a number of similar institutions already exist throughout the world, and California should have a complete understanding of the purpose and objectives of such an institution before recommending its creation.</p> <p>VI. Incentives</p> <p>ACC also agrees that a series of well-conceived and well-executed incentive programs can help create a better understanding of and commitment to “green chemistry.” Many of the options discussed through the “Conversation with California” warrant additional consideration.</p> <p>For example, there have been several suggestions that California should subsidize the market for “green” chemical products. While notionally attractive, ACC believes that there needs to be clear criteria for what constitutes a product or process that qualifies for support, and clear criteria for assessing</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>whether there are market failures that such support can remedy. Suggestions for fee rebates appear to be based on an assumption that industry will be paying fees, although for what remains little understood. Other options, such as low interest loans, or grants, or tax incentives (like tax “holidays”) may also be appropriate.</p> <p>ACC disagrees that it is necessary to strengthen product liability law to provide a greater incentive for consumer protection from potentially harmful toxic exposures. California (and indeed the United States in general) already has a robust civil liability system that provides significant incentives to manufacturers (not just those located in California) to take steps to protect consumers from potential exposures to harmful chemicals.</p> <p>VII. Research/Technology</p> <p>One of the most exciting components of the Green Chemistry Initiative is the potential to greatly expand research and development. As California no doubt recognizes, the chemical industry invests billions of dollars each year in fundamental research and development. One out of every four U.S. patents are related to chemistry, an indication of just how robust R&D is in the field – and an indication that the business of chemistry is in fact the Nation’s most innovative business segment. ACC believes that a set of clear criteria and objectives for partnerships with California (either businesses or academia), and an understanding of how California would approach the ownership of the intellectual property associated with such research, would help assure that companies are aware of the opportunities for support for R&D activities.</p> <p>VIII. Voluntary Measures</p> <p>ACC believes that any regulatory or legislative proposals suggested by DTSC should include an explicit acknowledgement of the value of voluntary programs – and an explicit compliance exemption for companies that comply with programs that meet certain criteria. In particular, California should explicitly recognize those industry-wide programs that have credible, publicly-reported performance metrics, and credible, third-party assessment and certification requirements. In some cases, compliance is a requirement of membership in an industry association or organization. Programs like these include management system approaches that address chemical product evaluations, including assessments of manufacturing processes and intended uses, among others. Explicit recognition of these systems will provide an important incentive for companies to demonstrate their performance in compliance, and would leverage scarce resources in both California and throughout the industry.</p> <p>IX. Funding</p> <p>ACC understood many of the comments in this category of the “emerging options” document to be directed at the question of how the State of California will fund their activities under a Green Chemistry Initiative, including regulation, compliance, and training programs, rather than funding incentives for cooperative research and development. ACC does not support the imposition of fees to support a Green Chemistry Initiative in the abstract. Similarly, ACC does not support the imposition of a surcharge on chemicals, or products made with chemicals, to fund activities to address long term environmental impacts. ACC believes the basis of a surcharge is problematic. For example, is the surcharge to be assessed on the first use of a chemical (or the use of virgin materials), or for the possible consequences of use of the product? Other suggestions in this area included fees on the mere use of toxic substances, which would then be used to fund government toxics use reduction activities, including data analysis and the provision of technical assistance. ACC believes that, should California believe there are general benefits to be obtained from government agency activities in “green chemistry,” those activities should be funded by general tax revenue.</p> <p>*****</p> <p>Finally, ACC believes that given the broad range of public input solicited and gathered by DTSC throughout the “Conversation with California”, the Department should consider providing an opportunity for public comment on its proposed recommendations to CalEPA and Governor Schwarzenegger. Publication of the proposed recommendations will provide a critical insight into how DTSC views the Green Chemistry Initiative and the opportunities to take short and long term action in the arena.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
F-C2C-15	<p>The American Chemistry Council (ACC) is pleased to provide the proposals and rationale for those proposals outlined below for consideration by California as it moves forward with the Green Chemistry Initiative.</p> <p>PROPOSAL: INFORMATION ON CHEMICAL EVALUATION APPROACHES A company that manufactures chemicals in and/or imports chemicals into California should have a publicly available overview of the approach it uses for chemical evaluation and assessment. Companies should affirm to the state that the chemical evaluation and assessment approach is publicly available.</p> <p>RATIONALE: Responsible companies conduct systematic and rigorous evaluations of their chemical products to assure that these products deliver their intended benefits, while protecting public health and the environment. These evaluations should include characterizations of risk associated with the use of the chemical products and a determination of any risk management precautions and activities needed to address that risk. California public stakeholders would benefit from a greater understanding of how product safety and management decisions are made. Implementing this recommendation would have a minimal cost-impact to the State.</p> <p>PROPOSAL: MANAGEMENT SYSTEMS A company that manufactures chemicals in and/or imports chemicals into California should have a management system that includes process and product safety elements. Company systems should be subject to third party certification by representatives of a nationally recognized auditing Board (e.g., Board of Environment, Health and Safety Auditor Certifications or ANSI-ASQ-National Accreditation Board). Companies should affirm to the state that the management systems are in place and that third party certification has occurred.</p> <p>RATIONALE: Industry and government experience in applying management system principles to safety and environmental issues has shown that this organizational approach is both prudent and effective. A management system is a recognized business management practice that allows an organization to strategically address its environmental, health and safety matters. System implementation reflects accepted quality management principles based on the “Plan, Do, Check, Act,” model using a standard process to identify goals, implement them, determine progress, and make improvements to ensure continual improvement. Properly implemented, a management system not only improves environmental and health and safety performance, but also increases overall efficiency and accountability. Implementing this recommendation would have a minimal cost-impact to the State.</p> <p>PROPOSAL: STATE RESEARCH & DEVELOPMENT CENTERS The state of California should establish research and development centers focused on sustainable chemistry and/or sustainable engineering within its University of California system, such as Centers for Excellence in Sustainable Chemistry at leading University of California campuses that are networked to address major sustainability opportunities and issues.</p> <p>RATIONALE: California should utilize its well-known and respected university system and professional associations in efforts to promote innovation through research programs in sustainability. These programs could include non-proprietary or pre-competitive work.</p> <p>PROPOSAL: CURRICULUM FOR CHEMISTRY DEGREES California should make risk assessment, including toxicology and life cycle thinking, part of the required curriculum for chemistry and/or chemistry related degrees conferred by State institutions.</p> <p>RATIONALE: California could be a leader in promoting appropriate and necessary curriculum for future chemists. This curriculum would ensure that as future chemists develop new products, they fully appreciate the potential impacts of such products on health and the environment. Dr. John Warner’s Green Chemistry graduate curriculum at the University of Massachusetts – Lowell is a possible example for consideration.</p> <p>PROPOSAL: FINANCIAL INCENTIVE AND RECOGNITION AWARD PROGRAM California should establish an awards program to provide financial incentive and recognition for innovations. This program should be open to all sectors</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>of the chemistry enterprise – including manufacturers, users, academic and government entities. Options for such a program could include grants, licensing fees or other income to researchers who develop innovations in non-proprietary or pre-competitive work.</p> <p>RATIONALE: Innovation results should be encouraged through financial incentives and recognitions.</p> <p>PROPOSAL: VALUE CHAIN COMMUNICATION</p> <p>California should encourage companies in important value chain sectors to identify information needs of the value chain’s members (upstream and downstream companies) and to establish communication processes to meet those information needs</p> <p>RATIONALE: By facilitating the flow of hazard and safe handling information along the value chain, California will enable companies within a value chain sector to access and apply risk information for its own operations and for its own products</p> <p>PROPOSAL: REGULATORY PROGRAM BUILT ON LEVERAGED INFORMATION</p> <p>If DTSC determines that it needs its own regulatory program specific to California, it should adopt the output of the Canadian Chemical Management Plan (based on Canada’s categorization and prioritization of the existing chemical inventory) as a solid, scientifically sound foundation.</p> <p>The program should also leverage information that will be generated under the August 2007 Montebello Agreement between Canada, the United States and Mexico.</p> <p>If needed DTSC could establish a California-specific chemical evaluation process to address circumstances in which DTSC identifies uses of concern for priority chemicals that were not on the original CEPA categorization process or that will not be addressed under the Montebello Agreement in the timeframe required by DTSC. The process should utilize a tiered approach, in which chemicals and their uses are prioritized for further evaluation. The process should also utilize risk-based screening and should focus on potential “data needs” versus “data gaps”. Producers and users of identified priorities should be engaged in a collaborative process to bring hazard, use and exposure information to improve decision-making. As DTSC proceeds with its process, it should leverage information already generated or that will be generated under regulatory or voluntary chemical evaluation programs. DTSC must be transparent in the processes used to make risk evaluation and risk management decisions.</p> <p>RATIONALE: In order for DTSC to conduct evaluation work in a timely manner, it cannot afford to work in isolation. Establishing an entirely new prioritization program would take years of development before implementation could even begin. Instead, DTSC will need to build from the foundation of an established process and to leverage evaluation work generated by other parties.</p> <p>Stakeholders in California have publicly supported the Canadian Chemical Management Plan based on Canada’s categorization and prioritization of the existing chemical inventory. California’s collaboration with Canada on this process will accelerate progress in both geographies.</p> <p>The August 2007 Montebello Agreement between the US, Canada, and Mexico will result in significant chemical evaluation work being completed in a relatively short timeframe. DTSC should take advantage of the upcoming work to be conducted by the US, Canada, and Mexico. This would clearly allow DTSC to save time and resources, while advancing the protection of health and the environment. It would also allow DTSC to be viewed as a global leader in integrating the Montebello evaluation outcomes into its own process.</p> <p>If DTSC intends to move forward in the most time-effective manner possible, it must also recognize that a prioritization of chemicals is essential. A set program, with a specific list of chemicals and uses to address in a tiered fashion will provide the structure needed to make progress. If everything is a priority, then nothing is a priority – and nothing gets accomplished in a timely manner.</p> <p>Recognizing time limitations, as well as stakeholder concerns with un-necessary animal testing, DTSC must be pragmatic in leveraging existing information that support the DTSC’s overall program. This could include data submitted under regulatory programs, such as the 2006 Inventory Update Rule data that could be used to develop an initial understanding of volume, use and exposure and to assist in identifying uses of that raise the greatest concern. It should also include information generated under voluntary chemical evaluation programs, such as the High Production Volume Challenge.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
F-C2C-16	<p>Cradle through cradle Moving towards a cradle through cradle approach goes much beyond the current approach of simply looking at chemical properties & toxicity. Objective criteria need to be developed that do not only address toxicity, volume used or reduction in use, & long term health & environmental impacts, but also energy use regarding mining of raw materials, service life including the role of the substance, end-of-life potential with respect to re-use, recycling etc... Furthermore product stewardship initiatives addressing management with respect to specific substance properties should be integrated in a LCA approach, especially if such programs are designed towards a sustainable & long-term minimisation of the impact of the substance. This is in line with the SAICM approach where the management is central as it allows for better understanding & hence sustainable development in the use of chemical substances. This is an essential part of what constitutes a green approach to chemistry.</p>
F-C2C-17	<p>The below listed organizations appreciate the opportunity to provide comments on the California Environmental Protection Agency's (CalEPA) Green Chemistry Initiative. Our organizations represent many of California's and the nation's leading industries and employers. We fully support science and risk based chemicals management policies which protect health and the environment while assuring product safety and efficacy and promoting innovation in the marketplace in California.</p> <p>Chemistry is at the foundation of a wide range of industries. The science of chemistry helps to make the lives of Californians and others throughout the world safer, healthier, and more productive. Chemistry goes into modern materials used to make insulation, weatherization equipment, firefighting and other emergency response equipment, lightweight vehicle parts, coatings, lubricants, and energy-efficient appliances. Just a few of the many industries that use chemical or chemical-derived products include farming, new residential construction, emergency response services, plastic bottle manufacturing, electronics and high-technology, consumer products manufacturing, upholstered furniture manufacturing, dry cleaning services, building services and health care.</p> <p>We support the statement of CalEPA Secretary Linda Adams that this "...strategy, and the policy it champions, must have at its core and be governed by sound science." Advancements in science make possible product innovations that meet consumer needs, while increasing knowledge about the safety of chemical products and protecting the environment. A science-based assessment that evaluates human health and environmental considerations, performance, and cost and feasibility must include an examination of traditional and alternative technologies, materials and processes. Incentive-based approaches can allow companies to more easily and effectively share this knowledge, best management practices, and opportunities. Our industries and employees appreciate California's leadership in undertaking a comprehensive, scientific and risk based approach to this complex issue.</p> <p>Adhesive and Sealant Council American Chemistry Council AeA (American Electronics Association) American Sportfishing Association Association of Woodworking and Furnishings Suppliers California Chamber of Commerce California Circuits Association California Manufacturers and Technology Association California Paint Council Chemical Industry Council of California Consumer Specialty Products Association Flavor and Extract Manufacturers Association</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>Fragrance Materials Association Grocery Manufacturers Association Independent Lubricant Manufacturers Association International Association of Color Manufacturers International Sleep Products Association IPC – The Association Connecting Electronics Industries National Association of Home Builders National Paint and Coatings Association NFIB – California Soap and Detergent Association Society of American Florists U.S. Chamber of Commerce</p>
F-C2C-18	<p>DTSC should look at the procurement and / or contractual use of existing data and software tools to implement the Green Chemistry Initiatives for the short-term and long-term program needs. Previous posts have indicated various available existing chemical data systems and tools, including Chemical Compliance Systems, the Canadian efforts, and the European REACH program. Use of these types of tools could facilitate implementation of voluntary and/or regulatory programs in the near future as a beginning effort and establishment of a foundation, to be built upon in future developments, meeting the Green Chemistry initiative goals and objectives. One example of a potential use of existing tools is the establishment of a product “green” certification program which would allow consumers to readily identify green products. This type of program is already available via use of Chemical Compliance Systems data tools that can provide an automated “Green” assessment of chemical products which can be readily tailored for use in California. The use of such existing programs can provide efficiency through the avoidance of “re-inventing the wheel” and expanding on proven technologies and / or approaches.</p> <p>Through the procurement and / or contractual use of existing data and software tools, DTSC should establish programs and/or partnerships by which these types of tools and data can be made available to other stakeholders (such as product manufactures, business and private consumers, other government agencies, etc.) on a free or lower-cost basis for the purpose of meeting or promoting the Green Chemistry Initiative goals and objectives.</p>
F-C2C-19	<p>It is important that producers assume responsibility for the safe stewardship of their materials in order to promote environmental sustainability. Producers should be responsible for collection through processing/disposal, financially and operationally, with no cost to local government. Extended producer responsibility (EPR) will shift the responsibility for the end-of-life management of discarded materials from local government to private industry producers, thereby incorporating the costs of product collection, recycling, and/or disposal into product price, and encouraging product design that has a reduced impact on the environment and human health. The end results are products and product chains that have a reduced impact on the environment and that costs associated with a product's impact are paid by those manufacturing or using the product, rather than general taxpayers.</p> <p>Extended producer responsibility is the extension of the responsibility of producers, and all entities involved in the product chain, to reduce the cradle-to-cradle impacts of a product and its packaging. The greatest responsibility lies with the producer, or brand owner, who makes design and marketing decisions. Cradle-to-cradle impacts include energy, water, and materials use; greenhouse gas and other air emissions; toxic and hazardous substances; materials recovery and waste disposal; and worker safety. EPR is a comprehensive, rather than single-attribute approach, and consequently, is more likely to result in the best environmental solution.</p> <p>EPR will reduce the volume of solid waste disposal and provide an incentive for producers to incorporate environmental considerations into product design; shift the responsibility for end of life products upstream to the producer and away from municipalities; and promote social and technological</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	changes toward establishing a sound material-cycle society in which resources are more effectively used by following the “3Rs” (reduce, reuse, recycle) principle. EPR will achieve a more equitable distribution of costs that reduces the burden on ratepayers and local jurisdictions and transfers waste-related costs to producers and consumers of products.
F-C2C-20	<p>Cradle to Cradle The risks associated with a particular application area of a chemical need to be evaluated on the basis of a full life cycle assessment (LCA). Risk should be understood to take into account the inherent hazard possessed by a given chemical and the exposure that humans or the environment have to the chemical through the life cycle of its application. It is feasible that hazardous materials can continue to be used as long as the risks associated with their use are acceptable.</p> <p>As an example, Swedish LCA assessment of televisions containing flame retardants compared with televisions containing no flame retardants showed that the FR containing televisions put less burden overall on the environment than televisions with no flame retardant. This was because the higher rate of fires, and any environmental impact of those fires more than offset the environmental burden from the flame retardant.</p> <p>A second example, might be that a chemical that allows ready recycling is to be preferred over one that does not, even though in isolation the eco-tox profile of the first chemical appears less attractive than the second.</p> <p>Even when risks are judged acceptable, there should be ongoing programs to minimize the risk. Fundamentally the goal is to drive risk to zero. This is achieved by a combination of hazard reduction and exposure reduction. At Albemarle Corporation we have programs in place with the goal of achieving zero emissions of chemicals from our production facilities and those involving our products at our customers. Green procurement policies at state and municipality level can be used to give the incentive to drive best practices to minimize risk.</p> <p>A major element in evaluating life cycle impact is end of life disposal of finished goods, and policy should drive and reward effective recycling. A major challenge facing us today is the how to deal with electronic waste. We believe that an integral part of the green chemistry initiative should address electronic waste disposal and the applicability of a product to recycle. To this end we believe that the opportunity for a collaborative industry / state initiative to develop solutions such as an in-state smelting facility should be explored. The technology exists for recovery of valuable metals, other chemical starting materials, and energy in the safe disposal of electronic waste.</p>
F-C2C-21	<p>GMA’s Perspective on a Framework for Green Chemistry The Grocery Manufacturers Association (GMA) represents the world’s leading food, beverage and consumer products companies. The association promotes sound public policy, champions initiatives that increase productivity and growth and helps to protect the safety and security of consumer packaged goods through scientific excellence. The GMA board of directors is comprised of chief executive officers from the Association’s member companies. The \$2.1 trillion consumer packaged goods industry employs 14 million workers and contributes over \$1 trillion in added value to the nation’s economy.</p> <p>GMA appreciates the opportunity to participate in a dialogue on California’s Green Chemistry Initiative with California’s Environmental Protection Agency (CalEPA) and other interested parties. Our membership includes leading consumer products companies that produce safe consumer products that are protective of human health and the environment while improving the quality of life and protecting the public health against dangerous diseases, infestation, and unsanitary conditions.</p> <p>Green chemistry is sustainable innovation. It is built upon a foundation of companies using hazard and exposure analysis to address safety prior to</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>marketing. It is about moving toward products with improved environmental quality that also improve performance and consumer value to better meet all consumer needs. It uses analytic tools such as life cycle assessment to guide real product improvement and to protect against burden shifting or regrettable substitution with unintended adverse consequences, such as occurred with MTBE.</p> <p>Background Our members are committed to thoroughly evaluating their products for human and environmental safety through rigorous safety-based assessments before they are marketed. Our members provide clear and meaningful labeling on consumer products to ensure that consumers use products in accordance with label instructions. Our members routinely apply green chemistry and green engineering principles in their operations and have been honored with awards for their efforts. The consumer products industry develops products that meet or exceed the safety requirements of all state and federal agencies in the United States and Canada charged with regulating those products, including the California Department of Pesticide Regulation, the California Air Resources Board, other state agencies, the U.S. Consumer Product Safety Commission, the U.S. Environmental Protection Agency, the U.S. Occupational Safety and Health Administration, the U.S. Food and Drug Administration, Health Canada, and Environment Canada. GMA supports initiatives that continue to foster innovation and encourage universities, educational institutions, and industry to partner in developing effective “greener” ingredients that reduce environmental impact. We support company performed safety-based assessments of consumer products prior to the marketing of a product, considering all phases of the lifecycle of a product. Any chemicals management program must be based on sound scientific risk assessment to protect public health and the environment, and we support appropriate use-restrictions for chemical ingredients when those scientific safety-based assessments indicate they cannot be used safely in consumer product or use application. We support initiatives by companies, government and interested parties to promote consumer awareness of the importance of reading and following label instructions for safe product use, storage and disposal.</p> <p>We applaud collaborative efforts to encourage public and private partnerships, with a goal of developing greener products and environmentally responsible ingredients based on life cycle considerations, rather than mandatory and voluntary state labeling programs that endorse green products or programs that stipulate a single third-party certification of green products or numerical ranking. We encourage research that shows opportunities for the use of green chemistry in consumer products, as well as policies designed to overcome barriers to commercial application of green chemistry research and development efforts. We support initiatives that create incentives for innovative companies that develop greener products that are technologically and commercially feasible, and we encourage recognition for companies that develop sustainable business operations, processes and/or products.</p> <p>General Principles We believe that the Green Chemistry Initiative should ensure the safety of consumer products through the use of sound science in the decision-making process. It must foster innovation and encourage the development of new chemistry technologies. The Initiative should be designed to promote products that are technologically and commercially feasible to produce without compromising product efficacy, performance and usability. It should build on existing statutory and regulatory structures, voluntary initiatives and data development efforts. Finally, CalEPA should seek guidance from all stakeholder interests.</p> <p>Key Elements for the Green Chemistry Initiative We respectfully submit that the framework for the Green Chemistry Initiative should include the following elements: (1) A Systematic, Collaborative Process to Address Priority Chemicals: We support California’s initiative to move beyond a chemical-by-chemical approach and build a more systematic, scientific and collaborative process to address priority chemicals. As Governor Schwarzenegger recently stated: “I strongly believe there needs to be a systematic way to address these types of concerns where California’s scientists can work together with experts throughout the world to evaluate the health effects of chemicals, assess the risks they pose, and ensure that the safety of possible alternatives receives the same consideration.”</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>It is eminently sensible for California's collaborative effort to proceed in tandem with ongoing work by other government agencies assessing chemicals. The Canadian Government announced their Chemicals Management Plan on December 9, 2006. Numerous substances that have been in commerce for more than 20 years were assessed against rigorous scientific criteria. As a result of that process, Health and Environment Canada are now addressing priority chemicals as part of the Industry Challenge Program within the Chemicals Management Plan. Since Canada is undertaking this proactive approach for existing substances against the most modern science, we respectfully suggest that CalEPA collaborate with the Canadian government not only on the priority list of chemicals but the program in general. In our opinion, this collaboration would avoid needless duplication, inefficiencies and burdens, as well as take advantage of credible, high-quality scientific work already completed. This will help the government of California to meet its goals in a faster, more cost-effective way.</p> <p>Working with the Canadians and the Plan undoubtedly would foster greater results for the regulatory cooperation agreement for chemicals announced by the President and the leaders of Canada and Mexico this past summer. As part of the agreement signed in Montebello, the three countries agreed to share data, information and safety assessments so that all North Americans would have continued access to safe and effective products with improved sustainability and environmental quality profiles. With California's expertise at the table, collaborating with the agencies involved could accelerate the benefits of this effort across the North American region.</p> <p>As indicated in Governor Schwarzenegger's comment, it is important that California proceed with a science-based approach that focuses on key information, including toxicity and exposure of chemicals and possible alternatives, so that sound safety decisions can be made in the context of scientific risk assessment. This process must be the tool for focusing resources and attention on a limited number of chemicals that are important to evaluate. The process should be collaborative and should include scientific experts in toxicity and exposure from academia, chemical manufacturers, product formulators, and nongovernmental organizations. The manufacturers of the chemicals and consumer products could provide toxicity and exposure/use data to determine whether the uses of "priority chemicals" are safe or should be restricted.</p> <p>(2) Ingredient Communication: Some consumers have expressed a desire to know what ingredients are in the products they use in their everyday life. These consumers are interested in having this knowledge in order to make informed product choices.</p> <p>We support providing accurate information to consumers through ingredient communication. Manufacturers of essentially every name-brand product have programs to respond to the information requests and needs of consumers. For example, we actively work with consumers who call our toll-free numbers or send emails. We are always looking for better ways to communicate. Some third party assessments and information available on the Internet or through literature searches can be inaccurate due to the reliance on sources or on assumptions that may not be as current as the information provided by the manufacturers or industry groups representing the products.</p> <p>Industry has the obligation and continues to improve the methods it uses to communicate product information to consumers, especially in its efforts to ensure the safe and appropriate use of the products. We would like to work with California to implement a means of ingredient communication that would provide consumers with the information they can use to make even better informed decisions regarding the products they use in their homes.</p> <p>(3) Product Safety Assessments: Our members are committed to thoroughly evaluating their products for human and environmental safety through rigorous safety-based assessments before they are marketed. We support the continual improvement of safety assessments and methodologies including conducting life cycle assessments to help understand the health and environmental footprint of products and possible alternatives through their lifecycle. Our members have staff that includes experts in toxicology and environmental science to work on these assessments.</p> <p>CalEPA could work with scientific experts to examine best practices and to develop a toolkit for safety assessment programs and for safety assessments. Companies also could make a description of their safety assessment process available on the Internet. This could help provide context</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>for product ingredient communication. In addition to product safety assessments, companies could adopt programs to ensure the safety of raw materials and packaging, operations, storage and distribution, and the use and disposal of products. (4) Supporting Innovation: The Green Chemistry report argues that there is a need to close the “technology gap” through market-based incentives to support green chemistry. This could include funding for university research grants, scholarships, and similar programs, as well as awards for innovation, tax credits, low-interest loans, and other incentives. These positive incentives should be open to all companies that are innovators and sell products in California -- not simply be limited to companies located in California. * * * * *</p> <p>Chemicals are useful and essential ingredients for many products that protect public health and improve the quality of our lives. We appreciate the importance of a scientific approach based on an evaluation of hazard and exposure information to determine the safety of these products that improve the well-being of the public.</p>
F-C2C-22	<ol style="list-style-type: none"> 1. There are numerous opportunities to reclaim other process streams that may require refining (i.e. distillation, filtration, etc) prior to re-using that material back into the same process. Industry needs to work with DTSC on implementing regulations to allow more flexibility for generators to reclaim streams onsite without a tiered or Part B Permit. 2. DTSC should recognize pollution prevention and continuous improvement projects as integral components to the Green Chemistry Initiative (GCI) to encourage companies to implement these activities. 3. Chemicals should be regulated based on risk of exposure from the use in a product not a raw material or substance outright. For example, no lead in paint or toys, but allow lead as a raw material for other non-risk products, such as, lead-acid batteries. 4. The Pharmaceutical Industry should retain its TSCA exemption status from GCI. The EU Reach program currently exempts pharmaceuticals, since they recognize that the Pharmaceutical Industry is heavily regulated by FDA-like government agencies and there may be product quality concerns if there are modifications to the registered formulations.
F-C2C-23	<p>At Bayer MaterialScience we share society’s values of developing, producing and putting into the marketplace products that are both beneficial and safe for humans and the environment. We respect and support the objectives of Responsible Care® along with sustainable development as a commitment for management and as a responsibility shared by each employee.</p> <p>We at Bayer continue to address green chemistry objectives through innovation and product stewardship. Innovation is essential to driving green chemistry and sustainability in markets such as automotive, green building and alternative energy. Products and their uses are evaluated to help assure intended benefits to society while also protecting public health and the environment. We follow the American Chemistry Council's Responsible Care® program, with a management system that is certified by third-party auditors. We integrate knowledge of potential hazards of chemicals with an understanding of potential use and exposure in our risk management programs.</p> <p>We appreciate the California Green Chemistry Initiative's request for comments on the program and support an approach that addresses the following points:</p> <ul style="list-style-type: none"> • Look at the chemical information that is already available to California. • Make it clear that the Green Chemistry Initiative process will be governed by a risk-based science approach. • Support an understanding of both the benefits and the burdens of new regulatory proposals. • Consider process technology as part of a green chemistry program. <p>Look at the chemical information that is already available to California: We believe that California should consider existing data and information already available to California and the public before making judgments on</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>additional chemical specific data and information needs. There are existing programs such as the High Production Volume (HPV) Challenge Program and the Extended HPV Program, which have provided valuable toxicology and exposure information that is publicly available. Hazard information from such sources can be used in light of exposure scenarios to evaluate potential risk and ensure appropriate risk management. In addition, the information from the recent evaluation and categorization of chemicals on the Canadian Domestic Substance List (DSL), Canada, should be considered by California.</p> <p>Make it clear that the Green Chemistry Initiative process will be governed by science with a risk-based approach: We believe that the Green Chemistry Initiative must be based on sound science with a risk-based and weight-of-evidence based approach. Objective and reproducible scientific methodologies are the keystones upon which regulatory policy should be based. Everything can be toxic at some level; the key is to minimize potential risks (risk = hazard x exposure). The Green Chemistry Initiative should be based on the principles of risk. That is, minimizing the use of toxics in light of the exposure scenarios, along with considerations of efficiency and economics.</p> <p>Support an understanding of both the burdens and the benefits of new regulatory proposals: To most efficiently use resources, we believe that consideration should be given to existing chemical management systems. Many existing regulatory and voluntary programs promote innovation and advances in chemical technology, govern areas of product life-cycle, and also promote pollution prevention and research into the use of less hazardous substances.</p> <p>We believe that the Toxic Substance Control Act (TSCA) is a comprehensive chemical management statute. Criticisms of the TSCA to protect human health and the environment often overlook the real need for resources to properly administer the statute. Without the proper staffing and financial resources, any regulatory program will have limited effectiveness.</p> <p>Innovation is critical to green chemistry. Rather than imposing regulatory burdens, innovation through green chemistry can be promoted with positive incentives and partnerships. Green Chemistry should be encouraged through the sharing of expertise, financial support for research, information exchange, and public education. Incentives could be offered for companies to pursue and foster Green Chemistry and Green Engineering.</p> <p>Consider process technology as part of a green chemistry program: Green chemistry is an important consideration in efforts that lead to sustainable development, but it is only part of a potential solution. In a broader sense, green chemistry programs should include process technology considerations as alternative chemistry is being evaluated. This technology can have a significant impact on minimizing potential adverse health or environmental effects of a chemical substance. Process technology can reduce both human and environmental exposures to chemicals, for example, through enclosed systems, recycling of by-products, and controlling potential environmental releases. Use of these process technologies can eliminate the need for substitution of critical raw materials.</p> <p>In conclusion, we believe that a green chemistry initiative must be based on sound science, be risk-based, leverage validated existing health and environmental information, and consider engineering and processing technology. We feel that innovation and partnership with industry should be encouraged. Industry should be brought in as a critical stakeholder in this Initiative as it develops.</p> <p>On behalf of Bayer MaterialScience LLC</p>
F-C2C-24	<p>As a member company of ACC, Rohm and Haas Company has committed to Responsible Care®. Responsible Care® is the chemical industry's initiative to demonstrate continuous improvement in health, safety, environment and security performance processes and products. Responsible Care® provides the framework which helps to manage and evaluate chemicals along the supply chain and the framework to implement systems which help manage risks associated with chemical products. Responsible Care® requires companies to take a proactive approach to the needs of the public all along the life of a product.</p> <p>Rohm and Haas Company's environmental, health, safety and sustainable development values reflect our respect for the environment. We seek to</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	improve the quality of life through our products and services.
F-C2C-25	<p>Procter & Gamble Suggestions The California Green Chemistry Initiative holds a lot of promise for expanding the principles of Green Chemistry, accelerating innovation and creating important health, environmental, social and economic benefits. Through the Conversation with California—workshops, symposia and Blog contributions—it’s clear that there is broad interest and excitement about moving the state forward, both in improving protections for the environment and the health of Californians, and in creating a more sustainable future. P&G supports the State’s objectives. Here are some ideas that California can consider to advance GCI.</p> <p>Priority Chemicals—California should establish a program to identify, assess and manage priority chemicals based on an evaluation of hazard and potential for exposure</p> <ul style="list-style-type: none"> - Move quickly by leveraging priorities identified in the Canadian Chemical Management Plan. Create a collaborative effort between California and Canada to accelerate progress in both geographies. - Include a means for adding and deleting priority chemicals based on unique California circumstances. - Leverage the recently assembled U.S. Inventory Update report to provide initial volume, use and exposure information. Identify uses and user industries for the high priority chemicals that raise the greatest concern. Expect producers of priority chemicals and manufacturers with high concern uses to provide hazard and exposure information on those chemicals/uses to the program. - Provide the agency with authority and a due process to establish restrictions for uses of priority chemicals that have unacceptable risks. - Facilitate informed substitution in moving to alternatives for restricted uses of priority chemicals - Organize this overall effort in a collaborative approach involving chemical producers, targeted users/industries, the agency and appropriate academic and other 3rd party experts. - Engage with US EPA and the recently announced Canada-US-Mexico Montebello Agreement to avoid duplication and expedite action on priority chemicals in California and throughout North America. <p>Product Safety Management Systems—California should expect and encourage manufacturers of consumer and commercial products sold in California to employ comprehensive product safety management systems that include:</p> <ul style="list-style-type: none"> - Assessments to ensure the safety of products prior to marketing; - Rigorous control of production from raw material specifications, to formulation management, to process and quality control; - Safe operations that protect the health and environment of employees and the surrounding community; - Compliance with all applicable product safety, labeling and regulatory requirements including transportation, waste management and product disposal; - Constant vigilance in post market surveillance with rapid response to identified concerns; - Innovation that improves product performance, value and environmental quality based on life-cycle considerations; - Transparency in communicating information about safety management systems and products; and, - Ongoing evaluation and improvement of systems performance. <p>Animal Welfare—In pursuing the objective of the Green Chemistry Initiative to expand toxicology information on chemicals, California should encourage the use of alternatives to animal testing and require testing only as a last resort.</p> <ul style="list-style-type: none"> - The agency and UC university system could work with other experts to provide assistance on alternative screening methodologies that can be utilized to provide adequate toxicology information for recommendations and decisions about priority chemical uses. <p>Transparency—California should take the lead in expanding the amount and ease of accessing Information on chemicals and product safety.</p> <ul style="list-style-type: none"> - Expect and encourage manufacturers of consumer products to communicate information about the ingredients in products, either on the package or on the internet at the manufacturer’s discretion and with appropriate provisions for protection of Confidential Business Information.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> - Expect and encourage chemical and product manufacturers to update their MSDS's to the new 16-section ANSI standard and to reflect the latest hazard information from voluntary (e.g. HPV) and regulatory (e.g. Canada CMP) programs. - Encourage companies in important value chain sectors to work together to identify "beyond MSDS" information needs both upstream and downstream and to establish processes for communication to meet those needs. - Leverage California's capability and interest to assemble a chemical information system on hazard, use and exposure from global sources. Stimulate Green Chemistry Innovation—California should prime the pump to initiate early and significant advancements in Green Chemistry and to recognize and reward success. - Provide economic incentives for business innovation in green chemistry. - Provide economic support and incentives for innovation at California's University system: scholarships, research funds, technology licenses, etc. - Focus the above programs on development and commercialization of alternatives for restricted priority chemicals, including for small business application and on innovations that create breakthroughs in performance, value and environmental quality. - Develop a registry in which all stakeholders can document Green Chemistry successes - Develop an extension service through the UC university system to expand reapplication of successes across the potential user community. - Establish an Annual Green Chemistry Recognition program for new chemicals, products and processes and for advances in research, analytical and toxicological methods that best exemplify the objectives of GCI, - Continue the Conversation with California via ongoing workshops, symposia, and other communication approaches to maintain and build on the momentum established in the program to date. <p>November 15, 2007 Contacts: Bill Greggs, greggs.wj@pg.com Pat Hayes, hayes.pl.1@pg.com</p>
F-C2C-26	<p>Fossil-fuel-based plastic use in our society continues to grow at an exponential rate, creating a plethora of environmental impacts for California, the oceans and, increasingly places like Lianjiao, China (see http://news.sky.com/skynews/video/videoplayer/0,,31200-greenbritain_china_p222,00.html). The State of California has one of the most impressive recycling mandates in the country but I am very concerned about where our recycling, especially our plastic, is going.</p> <p>Most consumers believe that their fossil-based plastic, once placed on the curbside for recycling has been taken care of in a way that renders any potential problems with plastic waste solved.</p> <p>Myself and my colleagues at Green Sangha have been working over the past 2.5 years educating the public regarding plastic waste issues including pollution in the ocean.</p> <p>The central Pacific Gyre contains a plastic waste mass that has been measured to be larger than the state of Texas. Because plastic does not biodegrade, plastic entering the oceans remain there unless it is deposited on a distant beach. Fossil fuel-based plastic has entered the marine food web at many trophic levels impacting countless marine species (birds, salps, marine mammals, etc...please see: http://www.algalita.org/pelagic_plastic_mov.html)</p> <p>Small bits of plastic in the central Pacific Gyre outweighs zooplankton at a ratio of 6:1 (six pound of plastic for every pound of plankton!), according to research published by the Algalita Marine Foundation.</p> <p>Of greatest concern for my organization and me right now is what is happening to our plastic waste once it leaves the US shores not as litter but as commerce.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>At the link, http://news.sky.com/skynews/video/videoplayer/0,,31200-greenbritain_china_p222,00.html please find some news footage shot by Sky News in the UK. This news story highlights the situation that Californians don't know about and never see. It is the story of the dark side of plastic downcycling that all policy makers need to see, we believe.</p> <p>This short news piece is of great importance regarding plastic policy here in California. The plastic industry continues to repeat the mantra that plastic is fine; we must continue to use it but we need to do a better job recycling.</p> <p>I'd like the Green Chemistry Initiative to first acknowledge that fossil plastic is downcyclable not recyclable. And that most of our fossil plastic waste is being shipped overseas and being handled under conditions that are harming water, air, public health and the land surrounding so-called recycling facilities.</p> <p>In the video workers are exposed to mountains of unsanitary plastic waste. They melt it down and/or burn it; smoke and ash fills the air. Untreated polluted water runs into local streams turning them dark grey; they too are littered with plastic and ash. Workers are subjected to toxic fumes and heavy metals where PVC is downcycled without any idea that their work is dangerous.... Needless to say, there are no health or environmental standards in places such as Lianjiao, China.</p> <p>Our continued embrace of plastic needs to be looked at with a cradle-to-cradle perspective, which requires a close look at what is happening overseas. The Green Chemistry Initiative is for California, but for the initiative to have integrity in cannot be part of exporting waste that is causing great harm overseas. We in California need to develop closed-loop safe and just ways of handling our waste. The current model of exporting plastic to countries such as China needs to be stopped if California is serious about its Green Chemistry Initiative.</p> <p>Andy Peri Green Sangha</p> <p>Further information provided: a link to the short online version of the video described above and some articles regarding waste exports to China.</p> <p>on behalf of Andy Peri</p>
F-C2C-27	<p>GREEN CHEMISTRY AND BEYOND: SUSTAINABILITY, SAFETY AND CONTINUAL IMPROVEMENT</p> <p>INTRODUCTION</p> <p>Earlier this year, California kicked off its Green Chemistry Initiative with the stated goal of taking a collaborative approach to significantly reduce the impact of toxic chemicals on public health and the environment. The Soap and Detergent Association provides the following comments on behalf of its members so that California may consider new ways to manage chemicals towards the continual improvement of public and environmental health.</p> <p>The Soap and Detergent Association (SDA) is the non-profit trade association representing manufacturers of household, industrial, and institutional cleaning products, their ingredients and finished packaging; oleochemical producers; and chemical distributors to the cleaning product industry (http://www.cleaning101.com/). SDA members produce more than 90 percent of the cleaning products marketed in the U.S. SDA members strive to meet the commitments of a sustainable industry: 1) advancement of social well-being, 2) advancement of human health and environmental quality, and 3) economic growth. Cleaning products have been an integral part of the dramatic advancements in public health and longevity, and the decline of communicable diseases throughout the world over the past two centuries. SDA and its members have been at the forefront of research on the environmental and human-health safety of their products for the past 50 years, and a culture of innovation and continuous improvement among its members has resulted in a robust industry that is a leading contributor to the public health across the country.</p> <p>SUSTAINABILITY</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>Social Sustainability SDA members are committed to contributing to a better quality of life for our consumers, business partners, employees and the communities in which we operate, and to maintaining a high level of product stewardship throughout the chain of commerce. As such, we believe that decisions of preferability and substitution should be based on the comparative life cycle impacts of a chemical and its potential substitute. While a safety-based characterization scheme may focus on toxicity, persistence and bioaccumulation, there are a number of other parameters which are relevant to the sustainable use of a particular chemical in a formulation such as raw material sourcing and carbon footprint. All relevant aspects of sustainability should be taken into consideration for a potential substitution decision. Similarly, any plan to consider substitution of chemicals should require that the efficacy and benefits of that compound be considered as any diminution of efficacy may negatively impact public health and well-being through reduced hygiene and sanitation.</p> <p>Environmental Sustainability Cleaning products are chemical formulations, and generally each ingredient in a formulation will have some measurable toxicity. However, the use of cleaning products generally is well understood, leading to sound characterizations of exposures and risks. SDA members are committed to the enhancement of human health and quality of life through the responsible formulation, production and sale of cleaning products and ingredients, and their proper use. SDA members only market products that have been shown to be safe for humans and the environment, through careful consideration of the potential health and environmental effects, exposures and releases that will be associated with their production, transportation, use and disposal. In determining the safety of cleaning products, toxicity of ingredients to humans and wildlife is studied.</p> <p>Economic Sustainability The cleaning products industry is an important component of this nation's public health infrastructure and a contributor to the nation's economic well being. As such, it is important that the Green Chemistry Initiative not compromise this industry. SDA members are committed to innovating to improve products both in terms of performance and environmental impact. The Green Chemistry Initiative must ensure that product efficacy, performance, and usability are not undermined, and that the ability to innovate is not compromised. In fact, California is uniquely well positioned to foster innovation in Green Chemistry and product formulation. With a strong educational system including world-class research university and a robust high technology sector, California has the means to lead the world in developing and commercializing alternatives to high priority chemicals of concern. The Green Chemistry Initiative should include a significant component related to research and development of alternatives for high priority chemicals which leverages California's intellectual resource. Through such efforts, California could facilitate the development and application of chemicals that will reduce negative impacts to the citizens of California.</p> <p>SUGGESTIONS FOR CALIFORNIA Confirming the Baseline Safety of Chemicals in Commerce In order to affect the impact of toxic chemicals on public health and the environment, the inherent hazards and potential for exposure should be integrated into a risk framework, and risks should be managed appropriately. Currently, there are several national and international programs designed to evaluate and manage the risks of chemicals. California should leverage existing efforts and customize results to meet their needs. For example, in Canada, Environment Canada completed a prioritization exercise of 23,000 chemicals on their Domestic Substances List (DSL) in 2006. Using information from Canadian industry, academic research and other countries' data, Government of Canada scientists worked with partners in applying a set of rigorous tools to the 23,000 chemical substances on the DSL. They were categorized to identify those that were: inherently toxic to humans or to the environment and that might be persistent and/or bioaccumulative, and substances to which people might have greatest potential for exposure. From this exercise there were over 4,000 chemical substances identified as needing further attention, and about 19,000 (over 80% of the total) were set aside as not needing further action based on their hazard and exposure profiles. Among the chemicals needing further attention, 500 were high priority, 2600</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>were medium priority and 1200 were low priority, and most of the low priority chemicals were eliminated from consideration. Additionally, about 150 of the high priority chemicals were determined to not be used in Canada and were restricted from further use without an evaluation. In the end, Canada has moved forward to consider about 350 high priority chemicals and 2700 medium priority chemicals.</p> <p>California could focus on the 500 high priority substances identified in Canada's program. To address unique circumstances that might exist in California, the State could have a process to add substances to the high priority list, as necessary, based on hazards, uses and exposures to workers and consumers in California. Once the high priority chemicals are identified, use and exposure should be considered to determine whether there are impacts on human health and/or the environment. The State could work in coordination with other North American initiatives (e.g., Canadian Domestic Substances List prioritization, EPA and OECD High Production Volume Chemical programs, Security and Prosperity Partnership (SPP) of North America Regulatory Cooperation Framework) in order to assess the risks of the highest priority chemicals. In undertaking such programs, SDA urges the State to proceed with any chemical assessments in a manner that would avoid unnecessary animal testing. In cases where real impacts exist, risk management strategies should be implemented in order to reduce those impacts, including use-specific restrictions where there are unacceptable risks.</p> <p>Continual Improvement of the Safety Profile of Chemicals in Commerce</p> <p>California can continually improve the safety profile of chemicals in commerce in the State by focusing on the high and medium priority chemicals in use, and using Green Chemistry and other tools to facilitate informed substitution with chemicals having an improved safety and life cycle profile. There are a number of opportunities for California to apply its resources towards traditional Green Chemistry activities. California could leverage the universities in the State and the high-tech business sector towards the development of alternative chemicals for those of the highest priority, and development of alternative manufacturing processes for those with high discharges of hazardous waste. For alternatives identified, there should be a separate Life Cycle Assessment by an outside party, or state-funded Center for Excellence in order to confirm that there is no loss in performance with the alternative, to avoid unintended consequences, and to assist in commercialization. The State also could develop a Cooperative Extension-type program to assist companies in Cradle-to-Cradle product design/formulation and assist in adoption of new alternative chemistries and processes. In order to facilitate informed substitution of high priority substances towards those with a more favorable environmental and human health profile, the State could develop database of chemical alternatives that compares a number of sustainability parameters: performance, price, human health and environmental (e.g., toxicity, bioaccumulation, persistence) including carbon footprint and source sustainability.</p> <p>Additionally, the State could map the flow of chemicals in California using information drawn from existing sources such as EPA's Inventory Update Reporting (IUR), the data received by Canada during its data call-ins for high priority chemicals, and other contributions from the public. In order to assess the performance of these programs and measure the impact of these reforms, the State should monitor metrics that will assess releases of chemicals to the environment and exposure to humans.</p> <p>Increased Transparency and Access to Information on Chemicals in Commerce</p> <p>California could expand access to information on chemicals for consumers, businesses and regulators by leveraging its preeminence in data management and mining in order to organize the world's chemical data. For example, the dossiers for the EPA High Production Volume (HPV) Chemical Challenge program, and the related European program are often difficult to find and the data difficult to extract. By partnering with the information technology sector (e.g., Internet search firms), the State could expand access to chemical information, support its local industry and raise awareness of chemical safety information currently available. Additionally, California could expand product-specific chemical ingredient disclosure for consumer products which currently do not have that requirement. To increase transparency and improve the management of chemicals in the workplace, California should adopt the 16-section Material Safety Data Sheet (MSDS) described by ANSI Standard Z400.1-2004.</p> <p>Recognition and Rewarding Success</p> <p>As California's Green Chemistry Initiative unfolds, it will be important to recognize efforts and reward successes. The State could establish a registry for companies seeking to align their business practices with the Green Chemistry principles and acknowledge their intent. Similarly, the registry could</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>accumulate examples of product development decisions and substitutions that have resulted in reduced waste produced and energy inputs. The registry could be the basis for recognition of successes in reducing impacts from chemical exposures similar to the Presidential Green Chemistry Challenge Award, but focusing on results achieved through implementation of a program or application of a new chemistry rather than development of a new technology.</p> <p>SUMMARY</p> <p>California's Green Chemistry Initiative should emphasize all three components of sustainability: the social benefits of chemicals and products, the economic contributions through innovation and improved performance, and the environmental and human safety. California can confirm the baseline safety of chemicals through a prioritization based on hazard and exposure, assessment of risk, and management of risks including use-specific restrictions where necessary. California can drive innovation, the benefits of products and the continual improvement of the safety profile of chemicals by leveraging the State's expertise, and applying resources to the application of Green Chemistry research and development. California can expand access to information on chemicals in order to improve decision-making by taking advantage of their data management industries to organize the world's chemical data, and by increasing the disclosure of chemical ingredients in consumer products. Once California has implemented its Green Chemistry Initiative, it should recognize the efforts of those industries seeking to apply the principles of Green Chemistry and provide recognition to those that have had notable</p>
F-C2C-28	<p>The following is feedback to the questions provided by the Department of Toxics Substances Control.</p> <p>After over 16 years of environmental engineering experience working for the Department of Defense (DOD), two tools have been identified that require coordination and work to fully implement. These tools are standardization of the LCA process as feasible covering most products and the Chemical Compliance Systems (CCS) quantitative analysis database programmed with data to rank any chemical relatively to the universe of chemicals (quantitative analysis) and compare to the regulatory limits using the standardized environmental performance characteristic data provided by EPA and CAL EPA.</p> <p>With some work, these approaches would significantly improve the environment. At DOD and with those I interface with in the DOD and industry, it not a question of the intention to improve the environment and work "beyond compliance," but is a question of providing key data to the chain of industries moving product to market. This is now possible utilizing the CCS tool or similar applied to the LCA stages.</p> <p>Beyond the work, is a key to require manufacturers of chemicals, substances and products to provide both the hazardous chemicals in the Materials Safety Data Sheet (MSDS) and the nonhazardous chemicals so that a valid green rank score and comprehensive report may be provided via the web on-line automatically and real time. The report contains all the CALEPA and FED EPA environmental characteristics of concern with a normalized Environmental SCORE organized by the key areas ECOLOGY, HUMAN HEALTH and HUMAN SAFETY.</p> <p>Utilization of the ISO 14001 Environmental Management System (EMS) continual improvement for the environment of sustainability is an active process in DOD and city municipalities in whole or part that provides the management approach. Key is feedback to the manufacturers of chemicals, academia, industry, consumers etc so that the best choice for the environment may be made by all.</p> <p>This will mitigate the predicted increase of toxic pollution in the environment by CAL BERKLEY (see www.ucop.edu/cpre) "Special Report" Green Chemistry in California despite all the effort.</p> <p>Beyond Compliance is normal standard practice by DOD and industry. The key is quality real time information feedback to make the best choices by all involved in the "Cradle to Cradle" process of manufacturing-construction-R&D. As a team much is possible. Playing this in parts and pieces is not efficient.</p> <p>Further comments on Cradle to Cradle, Green Chemistry and Toxics in Products by Design.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>on behalf of Ray Paulson, P.E. Fleet Readiness Center Southwest North Island</p>
F-C2C-29	<p>The California Green Chemistry Initiative (GCI) is an innovative mechanism with the potential to influence the design of products in ways that reduce the use of harmful chemicals and generate less waste and pollution. The objective to create partnerships between industry, the public, and government agencies to bring about this change represents an interesting social experiment. The success of such partnerships will surely rest upon the ability to simultaneously meet the competing needs of all stakeholders. Chemical Compliance Systems, Inc. (CCS) believes we have unique resources that can effectively assist California result in successfully establishing GCI partnerships.</p> <p>CCS has compiled the largest and most accurate relational hazardous chemical/product and regulatory databases in the world over the past 22 years. These unique databases have been derived from over 1,000 sources and are currently comprised of approximately 75,000,000 data elements for 210,000 chemicals, 350,000 products and munitions, and 650 local, state, federal, international and nongovernmental organization regulations. These databases are maintained current, expanded on a daily basis, and are constructed to facilitate utilization of discrete elements in a wide spectrum of analytical compliance systems. CCS has currently developed 13 nonmunition and 10 munition Web-based analytical compliance software modules that utilize different elements from these databases and could immediately be implemented, or easily be customized, to support GCI requirements/needs. In addition, CCS has developed eight detailed concepts that will apply to more broadly defined GCI considerations.</p> <p>CCS has been working to “green” products and the environment for nearly 10 years. We currently have four separate, but equivalent, Web-based “green” analytical compliance systems for chemicals, products, processes and munitions. Each of these four modules utilizes the same 43 specific ecological, health and safety criteria to quantitatively evaluate the “greenness” of a chemical, product, process (including wastestreams), or munition. Each of these systems also includes alternative product/process constituent chemical data tables to facilitate the selection of a less harmful ingredient. In combination, the “green” product/munition and process modules provide a complete life cycle (i.e., “cradle to cradle”) analytical capability. Each has product design and evaluation capabilities that enable chemists/engineers to design “greener” products/processes upfront, and acquisition, regulatory and ecological/health/safety professionals to assess, or compare, the “greenness” of the overall product/process (wastestream) to the level of detail they require. Each of these modules also simultaneously identifies the regulatory impact of the overall product/process, parts or components, or individual constituents. These tools will enable California regulatory agencies to partner with industry and the public to establish objective and quantitative “green” standards, or performance measures, for products and processes that can be incrementally increased over time and apply fairly to both small and large companies. The utilization of harmful chemicals will be reduced and less waste and pollution will be generated. The “green” standard will be a known, level playing field for industry, and the result will be greater protection for workers, the public, and for the environment. These “green” capabilities have also been incorporated into a Web-based Chemicals of Concern module that can quantitatively rank the concerns for a chemical/product inventory at a facility, thereby focusing alternative chemical acquisition, or research, on the worst offenders first, effectively accelerating pollution prevention.</p> <p>CCS regulatory compliance capabilities draw upon our List of Lists data that currently includes 650 state, federal, international, and nongovernmental organization lists and associated data. Our Web-based compliance capabilities are available as standalone modules, or incorporated into other analytical tools (as described above). Compliance assessments can be applied to facility inventories, products/processes, waste classification, and/or CERCLA/RCRA site remediation. CCS is scheduled to develop a new, Web-based Health Risk Assessment module for the U.S. Army that will utilize</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>our existing, Web-based Conceptual Site Model, and simplify RCRA Subpart X and CAA Title V Permit applications. Finally, CCS has conceptualized a Chemical Homeland Security System (C-HoSS) that will utilize existing facility chemical/product inventories to quantitatively rank resident chemical hazards, security risks and mortality risks by location at the facility. These three reports quickly prioritize inventory concerns. Entry of container accessibility constraints (i.e., storage conditions that control access) for chemicals of greatest concern enables C-HoSS to rank container vulnerabilities and identify accessibility requirements to nullify all vulnerabilities. C-HoSS concern levels are made proportional to the Homeland Security Advisory System daily risk levels. C-HoSS addresses all four levels in an effective security program (i.e., vulnerability assessment, corrective strategy, third party verification, and management system incorporation). C-HoSS will be a good tool for effectively eliminating terroristic chemical vulnerabilities at a facility. In addition, C-HoSS could have direct utility for preparation of California permit-required Security and Emergency Response Plans. Implementation of C-HoSS across the entire State of California can be accomplished “free,” utilizing a state grant for “equipment” from the Department of Homeland Security.</p> <p>CCS hereby offers to provide a remote demonstration of our existing Web-based capabilities and detailed concepts, at no charge, to any parties interested in their potential utilization in support of the California GCI, to achieve corporate “green” objectives, or to utilize in “green” product acquisition.</p>
F-C2C-30	<p>My name is George Kopcsak. I am the former Deputy for Munitions in the Office of the Secretary of Defense. During that time efforts were initiated to accelerate the demilitarization (DEMIL) of approximately 1 million tons of old, outdated, unstable and/or incompatible munitions in our nation’s stockpile. Initially this was accomplished through open burn and open detonation techniques. More recently there has been much focus on more environmentally friendly means to destroy munitions or to recycle the components. Some of this work is done within the state of California.</p> <p>Within the past decade a small business organization, Chemical Compliance Systems (CCS), has developed a metric to determine the environmental impact when differing DEMIL techniques are utilized. This metric is called the Green Munitions Analytical Compliance System (G-MACS) and was sponsored and initially funded by the US Army. I’m happy to say that this tool now exists on the web. Since this tool evaluates the ecological, health and safety risks associated with munitions by breaking each down to the chemical level I have learned that the tool can also be used by munitions designers and producers to evaluate the environmental impact of specific chemicals used to make the devices. The designer now has a tool to change specific components within a munition design and determine its positive impact on the “Greenness” of the design. The idea can now be carried forward to look at designing munitions to ease the environmental impact of its anticipated DEMIL 20 years down the road.</p> <p>Since CCS has focused on munitions at the chemical level they have been able to broaden their “compliance system” tools looking at any and all products being designed, produced, or destroyed as long as the chemical composition is known. This looks like a good fit with the California Green Chemistry Initiative. I believe that you should seriously consider its use.</p> <p>As a final note, the web-based CCS tools (G-MACS, GP-CAS, and G-MACS) appear to have the capacity to look at chemical compatibility issues related to their close proximity with a product design. This may well become important when one considers the environmental impact of munition/product aging or temperature cycling.</p> <p>Please give these tools a look.</p>
F-C2C-31	<p>The Dow Chemical Company (Dow) appreciates the opportunity to provide additional comments on a recent discussion initiated by the California Environmental Protection Agency on chemicals management policy. As a company providing products and services in over 175 countries, we comply with a broad range of chemical management policies and programs. Dow supports a consistent, coordinated regulatory environment for products at global, national and regional levels to complement industry voluntary efforts and to ensure a level playing field. Where new regulations are required, they should be based on established scientific risk assessment and risk management principles – predictable, flexible and capable of responsibly addressing society’s economic, environmental and safety requirements. We recognize that regulatory systems will inevitably vary by country since they must work effectively within the broader statutory and regulatory framework for each country. Nevertheless, we generally support broad regional</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>programs that provide the greatest consistency and uniformity for the industry as a whole. As a result, Dow is not an advocate for any particular program. Instead, we have developed a set of principles for effective chemical management programs. As governments select specific legislative or regulatory approaches to product safety or chemical control policies, we believe that certain principles should be adhered to, and we present them below.</p> <p>on behalf of Dow Chemical Company</p>
F-C2C-32	<p>The Bromine Science and Environmental Forum (BSEF) is pleased to offer the following recommendations to the California Department of Toxic Substances Control (DTSC) for your consideration in developing and implementing the Cal-EPA Green Chemistry Initiative.</p> <p>Summary: The guiding principle for this proposal is that it relies on successful management of chemicals already in the marketplace according to their characteristics and actual uses, rather than simply banning substances. This focus recognizes the important difference between risk and hazard, i.e., that hazardous substances properly managed may not pose actual risks, and would create a system that is based on successful management of identified risks, as opposed to establishing prohibitions based on potential hazard.</p> <p>on behalf of the Bromine Science and Environmental Forum (BSEF)</p>
F-C2C-33	<p>Rutgers University purchases thousands of chemicals and products for use in hundreds of buildings throughout our three campuses. We have implemented comprehensive acquisition processes to assure that the products we purchase are manufactured and distributed in compliance with all applicable laws and Rutgers standards. In the past six months, I have become aware of the Web-based "Green" Product Compliance Analytical System (GP-CAS) and the "Green" Process Analytical Compliance System (G-PACS) developed by Chemical Compliance Systems, Inc. (CCS). These two, quantitative, Web-based systems have been incorporated into a third party cleaning product certification program by the Chlorine Free Products Association (CFPA). Together, GP-CAS and G-PACS evaluate the entire life cycle of a product. Rutgers University is currently in discussions with CFPA and CCS about the possibility of incorporating these capabilities into our chemical and product acquisition processes. California may find these existing Web-based capabilities applicable to the objectives of your Green Chemistry Initiative. They certainly have the potential to achieve a voluntary product certification program that could increase the application of available chemical hazard information in a way that reduces labor and cost requirements for both the State and industry, while increasing the protection of the public and the environment.</p>
F-C2C-34	<p>The Dow Chemical Company (Dow) is pleased to provide the attached paper on the role educational programs could play in California's Green Chemistry Initiative (GCI). We have appreciated the open, collaborative environment utilized for this process and have taken advantage of opportunities to participate in a variety of ways.</p> <p>Attached is a brief paper on educational programs where Dow has been engaged with the objective of improving science education and understanding of sustainability. This is intended to catalyze DTSC's thinking about the role education can play and the types of programs to consider. Dow believes that education must play a key role in California's Green Chemistry Initiative for the effort to reach its full potential.</p> <p>on behalf of the Dow Chemical Company</p>
F-C2C-35	<p>The Consumer Specialty Products Association's California Green Chemistry Principles</p> <p>Belief Statement: CSPA members are committed to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>Background:</p> <ul style="list-style-type: none"> • CSPA member products improve the quality of human life and are necessary to protect the public health against dangerous diseases, infestation, and unsanitary conditions. • CSPA members are committed to providing products that are thoroughly evaluated for human and environmental safety and go through rigorous safety-based assessments before they are brought to market. • CSPA members are committed to clear and meaningful labeling on consumer products, i.e., label instructions are written to ensure that consumers use products in accordance with label instructions. • CSPA members are committed to the development of green products that are safe for human health and the environment. CSPA members routinely apply green chemistry and green engineering principles in their operations and have been honored with awards for their efforts. • The consumer products industry develops products that meet or exceed safety requirements of all state and federal agencies in the United States and Canada charged with regulating those products, including the California Department of Pesticide Regulation, the California Air resources Board, and other state agencies, U.S. Consumer Product Safety Commission (CPSC), the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the U.S. Food and Drug Administration (FDA), Health Canada, and Environment Canada. <p>CSPA Supports:</p> <ol style="list-style-type: none"> 1. CSPA supports initiatives that continue to foster innovation and encourage universities, educational institutions, and industry to partner in developing effective “greener” ingredients that reduce environmental impact. 2. CSPA supports company performed safety-based assessments of consumer products prior to the marketing of a product, that take into consideration all of the phases of a product’s life-cycle. 3. CSPA supports a chemicals management program based on sound scientific risk assessment to protect human health and the environment. 4. CSPA supports appropriate use-restrictions for chemical ingredients when scientific safety-based assessments indicate that they cannot be used safely in a consumer product or use application. 5. CSPA supports initiatives among companies, government, and interested parties to promote consumer awareness of the importance of reading and following label instructions for safe product use, storage, and disposal. 6. CSPA supports collaborative efforts to encourage public and private partnerships with the goal of developing “greener” products and “environmentally responsible” ingredients rather than mandatory and voluntary state labeling programs that endorse green products or programs that stipulate a single third-party certification of green products. 7. CSPA supports initiatives that provide incentives for companies that innovate and develop technologically and commercially feasible products using green chemistry. 8. CSPA supports research that identifies opportunities for the use of green chemistry in consumer products and also supports policies designed to overcome barriers to commercial application of green chemistry research and development efforts. 9. CSPA supports recognition for companies that develop sustainable business operations, processes, and/or products. <p>Essential Green Chemistry Program Principles:</p> <ol style="list-style-type: none"> 1. Green chemistry should ensure the safety of consumer products through the use of sound science in the decision-making process. 2. A green chemistry program should be designed with guidance from all stakeholder interests. 3. A green chemistry program should be designed to promote products which are technologically and commercially feasible to produce. 4. Green chemistry must foster innovation and not limit the development of new chemistry technologies.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>5. A green chemistry program must ensure that product efficacy, performance, and usability are not compromised or undermined.</p> <p>6. A green chemistry program should build on existing statutory and regulatory structures, voluntary initiatives, and data development efforts.</p>
F-C2C-36	<p>“Green Chemistry” is an intellectual framework that aligns technology innovation with improvements in the health and environmental “footprint” of materials used in our society. It requires inter-disciplinary collaboration among a variety of experts in chemistry, toxicology, and environmental science that work in business, government, and academia. Government cannot, and should not, dictate by statute or regulation precisely how this process for innovation and collaboration should occur.</p> <p>Importantly, a “Green Chemistry” program, in and of itself, should not be picking “winning” or “losing” products. Instead, it should be removing barriers and creating objective tools to allow companies to create new products and enable consumers to recognize and choose them. According to a March 28, 2002, publication of the Organisation for Economic Co-operation and Development (OECD) (of which the United States is a member) entitled, “Need for Research and Development Programmes in Sustainable Chemistry” (available at http://www.oecd.org/dataoecd/9/55/2079870.pdf), “For government, sustainable chemistry is a non-regulatory way of making regulations work more effectively.” OECD at 15.</p> <p>Member companies of the American Chemistry Council (ACC) are leaders in Green Chemistry and Green Engineering in their operations and have been honored for their efforts (e.g., see http://www.epa.gov/greenchemistry/pubs/pgcc/past.html for a list of EPA Presidential Green Chemistry Challenge winners). Our members view both the American Chemical Society’s (ACS) Green Chemistry Principles and the ACS Green Engineering Principles as useful approaches to resource efficiency, pollution prevention, and safety. These principles, however, were never intended to be applied as government mandates. In fact, prominently displayed on the home page of the Green Chemistry Institute is the statement:</p> <p>Green Chemistry differs from previous approaches to many environmental issues. Rather than using regulatory restrictions, it unleashes the creativity and innovation of our scientists and engineers in designing and discovering the next generation of chemicals and materials so that they provide increased performance and increased value while meeting all goals to protect and enhance human health and the environment.</p> <p>So, how can California encourage Green Chemistry rather than attempt to mandate it? Several actions may be taken to stimulate Green Chemistry in California and the United States broadly. For example, government can and should provide encouragement for Green Chemistry collaborations through the sharing of expertise, financial support for research, information exchange, and public education. In fact, a variety of federal agencies (including EPA and DOE), companies, professional associations such ACS, Non-Governmental Organizations (NGO), and universities are already working together to encourage Green Chemistry strategies. Additionally, government should consider offering incentives for companies to pursue and foster Green Chemistry and Green Engineering to help ensure these products/technologies can become economically viable and gain initial access to a competitive marketplace. These incentives might include tax incentives, low interest loans, awards, and marketing exposure.</p> <p>I. Education and Research/Development</p> <p>Industry is always working to drive down production costs. For specialties and fine chemicals, the synthetic chemists working in developing these materials have to know how to ask the Green Chemistry questions. This stands squarely in the realm of science education, especially in schools of chemistry. Not only do chemists and others involved in chemistry need to understand toxicology, but they also need to better understand the interaction between health and environmental protection, toxicology, and price. It is therefore essential that California support education in the methods and principles of Green Chemistry for all its state colleges and universities (and in its high schools and vocational schools, as appropriate). Anywhere that chemistry is taught, toxicology and Green Chemistry should also be taught.</p> <p>Additionally, California should encourage innovative research in Green Chemistry and Green Engineering. Research funding into new Green Chemistry</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>methods is always welcomed by colleges, universities, and others, and should be an important part of any Green Chemistry program. According to the OECD (again referring to their March 2002 publication): Governments can promote sustainable chemistry R&D...by establish[ing] and fund[ing] programmes on sustainable chemistry R&D. ... In addition, parts of industrial programmes are often supported by government funds. Governments, in general, can provide funds for basic and pre-competitive research. ...Practically, governments can orient sustainable chemistry R&D programmes by adjusting the distribution of funds for fundamental and applied research or by commanding competitive and targeted funds depending on policies. OECD at 15.</p> <p>II. Incentives To further stimulate Green Chemistry and Green Engineering, California should consider the following incentives: (1) awards like EPA's Green Chemistry Challenge (see http://www.epa.gov/greenchemistry/pubs/pgcc/presgcc.html for more information); (2) tax incentives/subsidies/grants/low interest loans for research and development; and (3) marketing exposure for Green Chemistry processes and products. For example, when California purchases chemicals for state contracts, it could decide to pay a modest premium for a set period of time for new "green materials" that show promise. The goal of this subsidy would be to help a new material achieve greater economies of scale, but avoid locking in an inefficient permanent subsidy. California could additionally make capital available to companies at preferential terms, whether via grant or lower interest loans, to encourage Green Chemistry and Green Engineering manufacturing process development. And California could also consider a marketing program (perhaps akin to the "California cows" and dairy ads currently on television) whereby the state would promote companies that are actively engaged in Green Chemistry and Green Engineering, and products that are the result of Green Chemistry and Green Engineering. The OECD suggests: [G]overnments can facilitate the consideration and application of sustainable chemistry R&D by supporting efforts which aim at educating and informing industry and the general public of the importance and benefits of sustainable chemistry. One possible role for government would be to identify incentives and disincentives for the promotion of sustainable chemistry and to use this information to modify or develop their policies accordingly. When appropriate, the use of incentives, such as a reduction in taxes or the use of subsidies, can be an effective way of supporting R&D by academia and industry in the field of sustainable chemistry. ... It is essential that any sustainable chemistry technology or product be competitive in the marketplace, at least in the long term. However, some of those technologies, even if they are beneficial in the long term, will not be able to survive economically without incentives. Economic incentives, such as subsidies or tax reductions, could be effective in these cases. OECD at 15 and 17.</p>
F-C2C-37	<p>CALIFORNIA MEDICAL ASSOCIATION A MODERN CHEMICALS POLICY FOR CALIFORNIA (2007) Introduced by: San Francisco Delegation Whereas, the state, national, and global scale of industrial chemical production is immense and is expected to grow four-fold by 2050, and the chemical industry is an important industry with wide contributions to health and human development; and Whereas, ever-expanding research confirms that many chemicals that are useful to society are also known to be hazardous to human biology and health, particularly in utero and in developing children; and Whereas, for new and existing medications, the Food and Drug Administration has long required pre-approval evaluation of safety as well as efficacy, and many industrial chemicals with known impacts on human biology are present in human bodies at levels similar to active doses of medications; and Whereas, numerous other nations including Canada and the European Union are adopting more proactive health-oriented chemicals policies, based</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>upon scientific knowledge, assessment, and accepted public health principles; and Whereas, there are long-standing deficiencies in the federal regulation of industrial chemicals, most notably in the Toxic Substances Control Act (TSCA), as confirmed by the National Academy of Sciences and others, and the University of California documented in a 2006 report to the California Legislature that TSCA's deficiencies are important and can be remedied; and Whereas, these problems include the projected appearance of 600 new hazardous waste sites each month in the U.S. over the next 25 years; the appearance of hundreds of industrial chemicals in human tissues and fluids, including those of infants; and the development of chronic diseases caused by chemical exposures on the job among 23,000 California workers each year; and Whereas, the American Public Health Association's leadership has recently endorsed a policy titled "Calling on the U.S. Congress to restructure the Toxic Substances Control Act and implement a modern, comprehensive chemicals policy", to be considered for adoption at the annual APHA meeting in November; Therefore, be it Resolved: That the CMA calls upon the State of California and United States to implement a modern, comprehensive chemicals policy in line with current scientific knowledge on human health, and which requires a full evaluation of the health impacts of both newly developed and existing industrial chemicals now in use; And be it further RESOLVED: That this matter be referred for national action (AMA). REFERENCES: http://www.healthandenvironment.org/science/papers on behalf of the California Medical Association</p>
F-C2C-38	<p>Life Cycle Assessment: Novozymes agrees with the arguments presented by Dow Chemicals regarding the need to evaluate the environmental impact of products and process changes in a life cycle perspective. Novozymes also favour the view that LCAs first and foremost are useful in comparisons of specific products/processes - as support to the decision making process. In that context Novozymes would like to emphasise that LCAs should always consider the actual consequences in the market of a change from one product to another. Novozymes has carried out LCA's for 4 years and has learned that acceptance of LCA results in a business community requires that consequences in the markets are taken into consideration. To use LCA terminology this is to say that LCAs should apply system expansion rather than allocation, which is also what is recommended in the new LCA ISO standard. Novozymes also supports adherence to the ISO standards, particularly that no LCA results carried out by companies can be published unless critically reviewed by 3rd party or published in a peer reviewed journal. Finally transparency is key. Weighting of results with the aim of arriving at a single score should be avoided. Environmental declarations: The increasing interest in knowing the carbon footprint of consumer products – such as expressed by for instance Walmart – calls for product declarations, which in a cradle to gate perspective (use of LCA) describe the environmental impact of said product. In Novozymes we observe an increasing number of requests from our customers for the environmental performance data for our enzyme products – for instance from detergent manufacturers, who want to establish the carbon footprint of their enzyme containing detergent. This development requires a standardized approach for making environmental product declaration. A new ISO standard (ISO 14025) has just been issued. In Denmark this ISO standard has formed the basis for a brand new environmental product declaration system (to be implemented primo 08). This system is claimed to be the only environmental product declaration system which is in compliance with both the revised ISO standards on LCA</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>(ISO 14040/44) and ISO 14025. More information on this system can be obtained from Kim Christiansen, Danish Standards (kc@ds.dk) The development of a standardised environmental product declaration system is a logical first step for reliable Eco-labelling systems. Eco-efficiency At Novozymes we would like to see green chemistry not only being a matter of substituting toxic chemicals with less toxic and more biodegradable chemicals. Novozymes products are enzymes and we have several examples where enzymes, which are biodegradable proteins, substitute harsh chemicals. This is for instance the situation in the textile industry and in the leather industry. We have also examples where small amount of enzymes, which are produced from agricultural raw materials, can substitute large amounts of chemicals of fossil origin. This is likely to be the situation in the detergent industry. However, use of enzymes can have environmental impacts which go far beyond mere substitution of chemicals. Enzyme products can improve the utilisation of the agricultural products used in the food, feed and fibre industries. In a world suffering from climate change and from a rapid increase in consumption of food and not least meat, the eco-efficiency of processes should be given much more attention. Novozymes has documented these eco-efficiency gains in peer reviewed LCA studies, which can be supplied on request to Karen Oxenbøll, Eco Efficiency Assessment (kmo@novozymes.com) Novozymes is the worlds largest enzyme manufacturer. Novozymes has R&D laboratories in Davis, California</p>
F-C2C-39	<p>yes, biometric sugar conversion via enzymatic oxidation will be the key to independence from petroleum.... why you'd be amazed at the output i'm getting with just sugar,water, hydrochloric acid and enzyme's hydrogen conversion from sugar is nifty, but i'm really shooting for a direct line tap... just so we are all aware of what "we" all should be doing...it is this... god{of your choice} has provided a very efficient and successful way of creating energy within all bio life forms via the conversion of sugars....all you, we ,I {well i've already done it} need to do is mimic the conversion process outside of a bio life form, eliminate all unneeded energy draws{that to which are generally used in life function} and tap only the electrical heat output....you can get enough direct current to generate viable power....cell phones now, houses and cars later....mow your law, rake your leaves, toss your food garbage into your "house stomach" shut the lid...let it "eat" watch it make power... lets not even get into converting our infrastructure to generate methane gas from our waste....most chinese rural farms do all cooking and heating with methane generated from there pigs waste.... stop chemical treatment and ocean dumping....dig a pit catch the gas...watch it burn... keep it simple...</p>
F-C2C-40	<p>"Cradle-to-Cradle" as a term is problematic: <ul style="list-style-type: none"> • Comparison of biologic recycling to industrial recycling is not an apples to apples comparison. <ul style="list-style-type: none"> o Biologic "recycling" breaks materials into smaller, biologically usable units and reforms them utilizing outside energy sources. This is a complete cycle of use from element/molecule to complex structure to element/molecule and back again. o Conventional mechanical industrial recycling reshapes articles into other articles and is hampered in that the constituent molecules "age" over the lifecycle. However, there are processes that break down molecules into smaller, industrially usable units that can be resynthesized into molecules and fabricated into articles. Energy is required, but the technology is similar to that currently in use for making industrial chemicals. This so-called "chemical recycling" should be studied as a way of implementing cradle-to-cradle thinking. <p>The term "cradle-to-cradle" is most often associated with Bill McDonough, working from the principle that all waste from one process must be an input for another. Those processes can be biological or industrial. In the biological process, animal or vegetable material is utilized by another organism. The preformed biological molecules or CO2 are converted by</p> </p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>metabolism or photosynthesis to new biological matter and thus reused.</p> <p>In the industrial cradle-to-cradle process, waste is effectively reused or recycled into another product. In the latter case, high level recycling—recycling of fabricated articles into other fabricated articles—is intended to preserve the energy and entropy already invested in making the raw material.</p> <p>I look at chemistry as being like a game of Scrabble. We take atoms--like the Scrabble tiles--and rearrange them into molecules--like words on the Scrabble board. Sometimes we create new words with only our letters; sometimes we co-opt other pre-formed words. But all we do is rearrange letters; we never create them and they never disappear.</p> <p>Chemistry is the science of transformation. In most of commodity chemistry—that which makes the high-volume building blocks upon which virtually everything else is based--we start with raw materials like the hydrocarbons in natural gas or petroleum and build them up, break them down or react them with other atoms to make useful products.</p> <p>But at some point, even with material recycling, those useful products are worn out or discarded. The atoms don't disappear--they get recycled, burned, degraded or put in a landfill. But recycling programs, unless 100% efficient are simply slower routes to the incinerator or the landfill.</p> <p>For example, even if a product has a 50% recycling rate, it means that after five cycles 95% will be discarded and out of service. And recycling an article does not necessarily rejuvenate the molecules or keep them from "wearing out" on a molecular basis. Especially polymer molecules can lose their properties through use, oxidation, photodegradation, weathering and reprocessing, to say nothing of simple contamination.</p> <p>So for the most part, we can follow any given set of atoms from gas or oil eventually to the landfill, faster or slower. Because of this, we have become comfortable with stewardship "cradle to grave". We are a bit flummoxed by the concept of cradle-to-cradle stewardship for synthetic materials.</p> <p>For biological materials, it is argued, cradle-to-cradle is a spontaneous system. In an ecosystem, all waste is food. Food is not necessarily recycled by organisms in the same article-to-article way as synthetic materials are; organisms also "burn" it as an energy source in addition to being a raw material for creating new living structures.</p> <p>For manufactured systems, a cradle-to-cradle life cycle is challenging. It may require intermediate steps that make progress but do not solve the problem as elegantly as nature has after a few billion years.</p> <p>While it hasn't yet been called "cradle-to-cradle"--at least as I remember--for about 20 years chemists and engineers have experimented with a chemical analog to biodegradation. Chemical feedstock recycling transforms plastics and other waste materials from long molecules in fabricated articles to shorter molecules not totally unlike the oil or gas they came from originally. There is a need to remove random chemical elements derived from dirt or other products; e.g., metals, sulfur and chlorine. But in principle, waste plastics or other materials can be taken back to a very crude oil-type product, or perhaps more correctly, to a liquid coal. Some quasi-commercial processes exist in Europe and Japan.</p> <p>Some early attempts were oriented to utilizing the crude product directly in an ethylene cracker or gasoline refinery. These attempts failed because such a crude product would quickly foul the highly efficient catalysts in those operations (See Green Chemistry Principles 2 and 9). On the other hand, today there is serious consideration of conversion of coal and water ($C + H_2O$) to synthesis gas ($CO + H_2$) in a process that removes random metals, sulfur and chlorine. Synthesis gas can be burned cleanly for energy, yielding only water and CO_2 which rather than being emitted could be sequestered or used for tertiary oil recovery. This is the basis of the FutureGen or IGCC coal process (USDOE: http://www.fossil.energy.gov/programs/powersystems/futuregen/)</p> <p>Synthesis gas, as the name suggests, is good for more than fuel. It is the raw material for industrial methanol and can be converted to hydrocarbons of various lengths via a process known as Fischer-Tropsch. Materials made by this process are functionally equivalent to naphtha or natural gas liquids. At least two chemical companies operate and license this "coal-to-chemicals" technology: Eastman Chemical and SASOL.</p> <p>Pyrolyzed waste can be treated to produce synthesis gas in a properly designed process. Experiments have been done in a British Gas/Lurgi gasifier in a Schwartze Pumpe plant utilizing varied raw (discarded) materials. More description of such processes can be found at the Gasification Technologies Council (www.gasification.org). Thus, refining oil to make naphtha and cracking it to ethylene, then polymerizing it, depolymerizing it at the end of its</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)

Number	Full Comment
	<p>service life to make a rough oil and then making naphtha via pyrolysis and synthesis gas is a nascent cradle-to-cradle process. "Chemical Recycling" can be used to recycle more than waste plastics. Cellulose and other biomass--think waste paper or other material that might also be a raw material for cellulosic ethanol--can also be pyrolyzed to ultimately make synthesis gas.</p> <p>Which gets to the salient point: energy. Cradle-to-cradle processes in biology do not operate without externalities; however, the external source of energy is solar. Utilization of solar energy by plants is only about 1% efficient; but given the virtually infinite nature of solar energy, plants don't need to be efficient. A process taking waste to chemical raw materials will require energy just as any other process does. But whether the process is more or less energy efficient than recycling or any other processing method is a topic for research and analysis, which the state of California could fund. And over the next 50 years there are very few environmental problems that could not be solved by a relatively cheap and plentiful source of renewable energy. Waste is just one of them, and no different than the others.</p> <p>For chemical processes, the proper energy analysis would compare various approaches to making, using and discarding or regenerating materials. This analysis would look broadly at inputs required to extract and transport oil or extract and clean up coal and compare them to the process of treating garbage similarly.</p> <p>There may be significant advantages, including energy advantages, to reusing resources that have already been extracted. Some argue that pyrolysis of biomass is has a better "energy return on energy invested" than breaking it down and fermenting is to ethanol. At first blush, this appears to be an expensive process--but perhaps not much more than some other alternative energy sources, especially those currently being subsidized. Collecting and delivering this material to a processing site is probably no more complex than the current system for collecting recyclables. Moreover, that "reverse distribution" system that powers recycling is energy intensive itself and the cost can only be supported by a high-value recycled material. On the other hand, our logistics are already well-optimized to deliver material to a landfill. Thus, proper segregation at the landfill—the mine, if you will--and processing geographically as close as possible could be an economical combination.</p> <p>Chemical recycling will probably not replace traditional high-level material recycling—bottles to bottles as we know it today--particularly if the price of oil and natural gas stays high. It's far easier and more profitable to mechanically recycle clean waste thermoplastics directly back into plastic articles and preserve the energy used in making them in the first place, but the key word is "clean". The materials that would be most useful as a pyrolysis stream are dirty, oily, composite, thermoset, films, tires, auto shredder residue or materials that otherwise would be difficult to recycle—in other words, most of the material we currently discard. Clean unpigmented tip-of-the-pyramid materials will find a more lucrative market for those who choose to collect them. Some will look forward to a day wherein every material we use is bio-derived, biodegradable and convertible back into bio-based raw material. That day, if feasible, is some time in the future, especially if we hope for a smooth transition in lifestyle along the way. Chemical recycling deserves serious consideration as a bridge technology that utilizes and recovers much of the refined value of oil and natural gas and uses waste materials as food for an industrial process.</p> <p>November 1, 2007 Anonymous</p> <p>My sincere thanks to the writer of this email. I regret your choosing to remain anonymous because you should be personally credited for this fine contribution. You have made visible some of the most critically important and centrally necessary understandings that will have to be taken into account for green chemistry to go forward.</p> <p>I salute your courage in bringing up some of the not-so-obvious and perhaps less-than popular, but realistic information about industrial recycling/chemical recycling compared to biologic recycling. The concept of "zero waste" from industrial production processes has long troubled me. Moving towards C2C is definitely in a much improved direction, but is not without problems and challenges. I liked your focus on transformation as the working process of chemistry and your placement of fossil fuels (both substrate and energy) at the core of the issues that green chemistry must address. Industrial recycling is a long way from the elegant, non-polluting, and non-destructive workings of nature. Chemical feedstock recycling of fossil fuels has held out and continues to hold out great possibilities for the future, especially with newly evolving technologies. California could fund</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>research in this very broad and promising area.</p> <p>As an interim measure, proposals for the conversion of harmful wastes to renewable energy and re-usable chemical feedstocks based on comprehensive energy analysis for the technologies chosen makes sense. However, much would depend on the results of the energy analysis and on the specific technologies and wastestreams chosen. It is important to note that this area of research is in its infancy, even as a bridge technology. You do not mention the considerable challenges ahead in instituting a C2C approach into a for profit market economy. If you have time, I would like to hear your thoughts about how this might be done. Many thanks again for your excellent email.</p>
F-C2C-41	<p>Last week I attended the Western Regional Pollution Prevention conference in San Diego and had a chance to see a demo of a software tool that would be incredibly effective in addressing some of the concerns here. In fact I understate my excitement because it is so eye-popping to see to see the software in action, I can only hope to do it justice here.</p> <p>The software is very sophisticated but unlike other solutions I've seen, this one is actually very user friendly. It is the first real tool I've seen that can be used by industry experts, academia and the general public. Wow, let me say that again...the general public can actually use this tool it is that user friendly.</p> <p>The implications for Compliance Managers, Risk Assessment Departments and Purchasing agents are enormous. In addition to these individuals who must regularly make decisions that affect their organization, colleagues, and communities, there are also many in the medical profession, biotech, agriculture, ecologists and yes even economists (!) can plug in use this tool to get the results they need.</p> <p>Those of us posting here can dig into the inner workings of the software, because behind the easy-to-use interface is a complex, meticulous database that has been so well tested and refined that it is virtually bulletproof with respect to passing peer-based reviews.</p> <p>Dr. George Thompson has spent 25 years creating a chemical database of 75 million data elements for more than 210,000 chemicals, 350,000 products compiled from over 1,000 sources. His software can generate a score that can accurately and effectively measure the toxicity levels in a given chemical recipe, process, or product and give specific information about the impact on Health, Safety and Ecology.</p> <p>Not only that, it is possible to cross reference information regarding the chemicals, CAS numbers, regulatory lists, (very exciting!) and can eliminate redundant data so that it's easier for departments to work together and get things done faster.</p> <p>There is much more detail that I can go into, however what's more important is that you, as you're reading this, get curious enough to check out Dr. Thompson's tool. It is worth the time to take a look, and even more than that, I would be thrilled to see the technology implemented as part of California's comprehensive solution. For this reason, I'm getting the word out on the other forums too.</p> <p>We need to be looking at this solution. There is no more time to wait.</p> <p>We must involve people at the business and community level.</p> <p>We must give people at the business and community level a tool that will work for them.</p> <p>No just us.</p> <p>Check out www.chemply.com</p> <p>Read more about this man's work. It is phenomena!!!!!!</p>
F-C2C-42	<p>The Department of Toxic Substances Control (DTSC) Director, Maureen Gorsen, met with DTSC staff in the Berkeley Regional Office on September 20, 2007, to gather their input on the Initiative. The comments below were received as a direct result of the breakout sessions and focus on the cradle to cradle approach.</p> <ul style="list-style-type: none"> • Involve Industry <ul style="list-style-type: none"> o Create incentives o Offer rewards

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> • Get involved with EP: Formal partnership • Partners with DOD SERGP • Focus on smaller manufacturers and industries that use toxics • Create mandatory green curriculum kindergarten to post graduate • Economic incentives <ul style="list-style-type: none"> o Tax breaks o Bonds o Loans • Regulation • Enforcement • Education/ Outreach <ul style="list-style-type: none"> o Public o Manufacturers • Develop Technologies • Require businesses to follow Livermore lab like process to disclose all chemicals used in the research and development /design process • Plan out processes to get to just-in-time purchasing • Incorporate green chemistry principles into purchasing • Tax or financial incentives • Consumer Education • Governmental contract preferences • Require government to do green chemistry evaluation • Tax incentives • Grants, loans for research and development • Grants, loans for research and development • Tax penalty for purchaser/producer • Education- public/producer • Recycle • Education-industry • Higher tax on harmful chemicals used • Tax incentive for use of green products • Regulations • Labeling <ul style="list-style-type: none"> o Chemical content in product o Chemical cost, i.e. CO2 process used o Chemical/energy cost in transportation, waste o Similar to ingredients o Euro model • Incentives

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> o Simplicity o Monetary o Recycling, reuse o Upfront waste disposal fees, including vehicles o Euro Model <ul style="list-style-type: none"> • Education o Public o Private industry <ul style="list-style-type: none"> • Definition of toxicity- harmful level • Needed to become toxic o People o Places fishes and biota o Habitat <ul style="list-style-type: none"> • Inventory of toxics- what is toxic? • Initial screening tests “new products” • Balance o Quality of life issues o Modernization <ul style="list-style-type: none"> • Grants and financial incentives for development of new products • Grants and financial incentives to develop products from waste and recycled materials • Educating companies regarding options of students • Develop an environmental curriculum
F-C2C-43	<p>Airgas, Inc., the largest U.S. distributor of industrial, medical, and specialty gases, and hardgoods, such as welding equipment and supplies, and the second-largest manufacturer and distributor of liquid carbon dioxide in the United States is committed to product stewardship innovation and to promoting environmentally friendly technologies. This is why we have long advocated the use of refillable refrigerant cylinders in servicing mobile air conditioning systems as well as stationary industrial, commercial, and residential refrigerating and air conditioning systems. Airgas led the industry in the late 1990s by introducing a 30 lb. refillable refrigerant cylinder to replace the standard size 30 lb. disposable cylinder. The use of refillable cylinders for refrigerants eliminates the emission of ozone depleting compounds and greenhouse gases remaining in disposable containers when they are discarded. Recognizing their significant environmental benefits, most developed countries, including Canada, the EU Member States, and Australia, have already banned the use of non-refillable cylinders for refrigerants. In addition to its atmospheric benefits, decreasing the number of cylinders discarded each year can also save tens of millions of pounds of steel (fostering conservation of an important natural resource) and hundred of thousands of cubic yards of landfill space nationally each year.</p> <p>The use of carbon dioxide (CO₂) in environmentally friendly technologies is another area that Airgas strongly supports. With growing concerns over the environment and global climate change, and increasingly stringent regulatory requirements, companies are actively searching for alternatives for many of the coolants, solvents, and other chemical substances they currently use, which will be greener and have a smaller environmental footprint. The distinctive properties of CO₂, combined with its environmental benefits, make it a cost- and performance-effective green alternative for other chemicals used in many industrial and commercial processes. Although CO₂ is a greenhouse gas (GHG), it is generally obtained commercially as an industrial by-product from existing operations and, therefore, its further use in other industrial and commercial processes and operations does not make any further,</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>or additional, contribution to global warming.</p> <p>The unique lubrication and cooling qualities of CO₂ are the reason it is seeing increased use as a coolant / lubricant, in industrial machining operations. Its use in these applications doesn't generate any hazardous waste compared to the disposal of hazardous cutting oils and biocides typically used in metal machining, which is significant when considering the cumulative environmental waste from the myriad of machine shops. In metal machining applications, CO₂ delivers considerable economic benefit via increased productivity and tool life, hence indirectly reducing consumption of other natural resources. In addition to being environmentally friendly, the use of CO₂ eliminates worker exposure to many of the hazardous chemicals used in the machining industry today.</p> <p>Dry cleaning is another area where use of by-product CO₂ provides an especially attractive, environmentally preferable, alternative. With pending regulation, perchloroethylene (Perc) in commercial dry cleaning operations is being replaced in California by alternative technologies. Hydrocarbon or petroleum-based solvents are currently the most popular choice when replacing Perc equipment. However, their environmental profile raises some concern, plus their cleaning performance is very limited as petroleum based solvents do not clean water based stains, which make up the bulk of stain types on clothing. Use of hydrocarbons is controversial because it increases Volatile Organic Compound (VOC) emissions. VOC emissions contribute to the formation of ozone in the lower atmosphere. Ozone has been linked to a variety of health effects including respiratory irritation, asthma, and premature death. Moreover, the environmental persistence of hydrocarbon solvent mixtures is mostly unknown and has the potential for contamination of soils and drinking water.</p> <p>Carbon dioxide is non-flammable and non-toxic. Unlike Perc and hydrocarbons, waste disposal is not an issue with carbon dioxide dry cleaning systems as any waste generated is not classified as hazardous. Also, it is a win-win for customers as it can be used for cleaning sensitive articles like silk, linen, and leather and can extend the life of garments due to a less aggressive, gentler process, thereby conserving resources for textile manufacture (an environmental benefit through reduction in resource consumption).</p> <p>In addition to being environmentally preferable to Perc and the alternative hydrocarbon-based systems, carbon dioxide is a commercially and economically viable alternative. The higher capital purchase cost of a CO₂ system can be offset by lower operating costs, improving its economic competitiveness. Short cycle times lead to higher throughput, improved productivity, and lower labor costs. Also, waste management costs are eliminated since process wastes are not considered hazardous.</p> <p>Airgas believes the concept of using by-product CO₂ for dry cleaning is an excellent example of product stewardship innovation - one that warrants enhanced, innovative incentives to expand its use more quickly as a Perc replacement. Although financial assistance (\$10,000 grants) for the dry cleaning industry to switch from Perc to non-toxic, non-smog forming alternatives like CO₂ and water-based cleaning systems is offered in California's proposed legislation (AB 998), it may not be sufficient for small businesses to purchase a CO₂ system which costs significantly more than alternative hydrocarbon systems. However, as more CO₂ units are installed, the cost of the systems would be expected to continue to decrease.</p> <p>The State of California, by taking a leadership role in Green Chemistry and sustainable technologies, can foster broader stewardship and encourage further innovation through development of creative incentives for environmentally friendly technologies like refillable cylinders for refrigerant gases and CO₂ for dry cleaning and metal machining.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)

Number	Full Comment
F-C2C-44	<p>Contributions from chemistry bring many benefits to society, but there are chemicals which can pose risks to health or the environment in certain circumstances. Some argue that the most sensible approach to these chemicals is to replace them with substances considered less hazardous—a seemingly simple concept, but substitution is not always feasible and not always the right choice. American Chemistry Council (ACC) members, through Responsible Care®, regularly consider substitution as an option in their broader green engineering and process design efforts. When doing so, companies must closely examine the implications for the safety, functional performance, and cost of alternatives to avoid ineffective changes with unintended negative health and environmental impacts.</p> <p>A good cook knows that you cannot arbitrarily change ingredients in a recipe. Whole wheat, rye, all purpose, and pastry are just a few of the many different varieties of baking flour. Yet, bakers know that while all flour is similar, many cannot be substituted without creating a result nobody would want to eat. The same holds true for chemical processing. You cannot simply replace one chemical ingredient for another without impacting the final product. Therefore, significant problems would result if chemical substitution were mandated as the solution of first choice without careful consideration of potential consequences. This is very much the approach taken by an international group of experts to the Intergovernmental Forum on Chemical Safety (IFCS) earlier this year in talking about “informed substitution”. (see the background elements of the IFCS paper available at http://www.who.int/ifcs/documents/forums/forum6/12_original_prop.doc)</p> <p>SUBSTITUTIONS MAY CHANGE THE NATURE OF THE PROBLEM RATHER THAN SOLVE IT</p> <p>Mandatory bans and forced substitutions often are not a complete solution because, as one issue is addressed, another set of concerns may arise. This is the difference between “informed substitution” and “regrettable substitution”, with the goal of “informed substitution” being to avoid “regrettable substitution”. For example, the health and convenience of our lives has been greatly enhanced by modern refrigeration. Refrigerators originally used ammonia, a toxic chemical, as a coolant. As scientific discoveries were made, chlorofluorocarbons (CFCs) replaced ammonia. While CFCs are practically non-toxic, they were later implicated in depleting the ozone layer and eventually banned. CFCs were then replaced with hydrochlorofluorocarbons (HFCs), which have no impact on the ozone layer, are non-flammable, have low toxicity, and high energy efficiencies. Scientists have now learned that HFCs could contribute to global warming if released into the air. Alternative coolants such as hydrocarbons and carbon dioxide have been considered, but both need to be carefully examined because of the potential for emissions and the possible dangers from higher operating pressures.</p> <p>In another example, consider the Peruvian government’s decision to stop chlorinating drinking water. The result in 1991 was a five-year epidemic of cholera which spread to nineteen Latin American countries, causing more than one million illnesses and 12,000 deaths. After the outbreak, U.S. and international health officials criticized Peruvian water officials for not chlorinating the entire water supply. An official with the Pan American Health Organization (PAHO) blames the inadequate chlorination, at least in part, on concern over disinfection byproducts. In a 1997 article in the Journal of the American Water Works Association, Horst Otterstetter states, “Rather than being abated by increased use of chlorination, the waterborne transmission of cholera was actually aided because of worries about chlorination byproducts.”</p> <p>Substituting one material for another is never as simple or straightforward as it might at first appear.</p> <p>SUBSTITUTIONS MAY RESULT IN UNINTENDED ADVERSE CONSEQUENCES</p> <p>Trading in a fuel-hungry SUV for a moped may address energy efficiency concerns, but it’s probably not a reasonable option for a mother of four. Like the moped, forced substitution, without full consideration of the potential impacts, is impractical and unwise. For example, some substitute chemicals require higher processing temperatures and greater pressure conditions in order to achieve the same result as the original chemical. Additionally, if the substitute chemical is not compatible with the processing equipment, it can cause break downs or failures. In some circumstances, the substitute is not as effective as the original chemical and more quantity must be used which results in larger amounts of waste materials and increased waste disposal</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>management and risks. All of these factors can lead to increased safety concerns for the worker population, as well as increased energy consumption by the company.</p> <p>This unintended consequence of substitution was clearly demonstrated in Europe when energy companies decided that fuel derived from plants would be more environmentally friendly than fossil fuels. Those companies developed specialized generators for palm oil, which increased demand. To keep up with that demand, palm plantations cleared large tracts of land by draining and burning peat land, resulting in huge carbon emissions into the atmosphere. The production of the plant derived fuel had an unintended consequence of creating more harmful emissions than the fossil fuels they were intended to replace.</p> <p>SUBSTITUTION IS NOT THE ONLY VIABLE APPROACH TO CONTROL RISK</p> <p>The principle of risk reduction is and always has been part of the normal day-to-day operations for the business of chemistry. Industry's ability to innovate allows us to respond to society's evolving needs for better, safer products.</p> <p>Beyond substitution, the chemistry industry considers many other options to minimize potential hazards, such as operational management systems, engineering controls, modifications to the chemical product, and waste management innovations. The industry also provides specialized consumer training and works with communities to implement effective recycle/reuse programs. Through ACC's Responsible Care® initiative, ACC member companies go above and beyond government rules and regulations to continuously improve their environmental, health, safety, and security (EHS&S) performance. ACC members employ a rigorous EHS&S management system that is certified by third-party auditors. Among numerous other elements, auditors verify that our companies have systems to manage risk associated with chemical products including management of product development, transport, use, and disposal in a safe and secure manner. Companies are also audited on their programs to protect the environment and to conserve resources, as well as their efforts to dialogue with community stakeholders about the organization's impact on human health and the environment. Company performance under Responsible Care® is publicly shared through americanchemistry/responsiblecare.com. For more information on Responsible Care®, please visit http://www.responsiblecaretoolkit.com.</p>
F-C2C-45	<p>We write to you today on behalf of CHANGE, Californians for a Healthy and Green Economy. Ours is a broad-based growing coalition of approximately 35 environmental and environmental justice groups, health organizations, labor advocates, community based groups, parent organizations, and others who are concerned with the impacts of toxic chemicals on human health and the environment, as well as the lack of a regulatory framework that seeks to prevent exposures to toxic chemicals. We thank you for your leadership initiating the Green Chemistry Initiative and would like to take this opportunity to join the Conversation with California by offering our perspective on what would make the program successful in addressing the critical human and environmental issues related to chemical use.</p> <p>on behalf of CHANGE</p>
F-C2C-46	<p>The Dow Chemical Company (Dow) is pleased to provide the following comments on California's Green Chemistry Initiative (GCI). On June 29, 2007 Dow provided initial comments that represented our principles for sustainable chemistry at a corporate level. That letter spoke of Dow's accomplishments in sustainability, Dow's aggressive 2015 Sustainability Goals, and Dow's suggestions for framing California's GCI. We have engaged fully in the DTSC's process; Dow people have spoken at two of the three Green Chemistry Symposia and have participated in the workshops, including serving as break-out session facilitators.</p> <p>This current submission offers Dow's more-detailed thoughts in the specific areas of:</p> <ul style="list-style-type: none"> § Life-Cycle Assessment § Eco-Labels § Consumer Choice

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>§ Environmentally-Preferred Purchasing § Incentives</p> <p>on behalf of the Dow Chemical Company</p>
F-C2C-47	<p>These comments respond to the American Chemistry Council's comments titled "Addressing the Data Gaps" posted on October 15, in particular those characterizing the types and amounts of information reported to EPA under:</p> <p>(1) the TSCA Inventory Update Rule (2) the US HPV Challenge Program and the industry's Extended HPV Program.</p> <p>(1) Information submitted to EPA under the TSCA Inventory Update Rule For certain chemicals in commerce, limited and infrequent reporting of production, use and exposure information by manufacturers has just been initiated under EPA's Inventory Update Rule (IUR). Such reporting is required only of chemical manufacturers (and in some cases, processors), but not of companies that use chemicals, whether directly or as ingredients in products. Beginning in 2006, manufacturers of non-exempt chemicals produced or imported in amounts of 25,000 pounds or more per year per site are required to report to EPA the information noted by ACC – to the extent it is "known or reasonably ascertainable." For chemicals manufactured in amounts of 300,000 pounds or more per year per site, the additional information on downstream processing and use noted by ACC must be reported – but only to the extent that it is "readily obtainable." Fewer than 10,000 chemicals are covered by the basic production information reporting requirements, and only a few thousand of these will be subject to the more extensive reporting that extends to downstream processing and use information. Reporting is required only once every five years and then only for a single reporting year. Much of the information reported to EPA is designated confidential business information (CBI). Under TSCA, EPA is prohibited from divulging any CBI to the public or to other governments, including the State of California.</p> <p>(2) Information developed under the US HPV Challenge Program and the industry's Extended HPV Program. For more detail and documentation of my comments below, see my recent report, High Hopes, Low Marks: A Final Report Card on the High Production Volume Chemical Challenge, available online at www.environmentaldefense.org/hpvreportcard. The Challenge represents the only systematic effort by the US Environmental Protection Agency (EPA) to foster the development of and public access to basic hazard data on a relatively large number of chemicals in commerce. It should be acknowledged that the program is developing and making public basic hazard information for more chemicals in less time than any prior effort, and it represents the first significant step taken in the US toward closing the gap between what we know and what we should know about widely used chemicals. But the limitations of this voluntary program and the information it is providing need to be understood as well. Because the Challenge is voluntary, it side-steps the onerous findings EPA must make to exercise its authority under Section 4 of TSCA to compel hazard testing of chemicals. However, for the same reason, EPA also has limited recourse to ensure full participation by manufacturers or the timely submission and high quality of hazard data sets developed for HPV chemicals. The following statistics on the status of the HPV Challenge, which began in 1998, are current as of July 2007. MORE THAN 18 MONTHS AFTER THE ORIGINAL DEADLINE, THE HPV CHALLENGE IS FAR FROM COMPLETE</p> <ul style="list-style-type: none"> • Two-and-a-half years after final data sets were due, fewer than half (47%) have been submitted. • 10% of eligible HPV chemicals were not volunteered for the Challenge by the companies that produce them; EPA has issued rules to compel testing

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>for only 6% of these chemicals.</p> <p>THE QUALITY AND COMPLETENESS OF FINAL DATA SETS HAVE YET TO BE DETERMINED</p> <ul style="list-style-type: none"> • The average quality of sponsors' initial submissions, while originally quite good, has declined over the course of the Challenge, especially in the past 18 months. The grade point average for initial industry submissions has declined from a solid B-plus in 2001 to a C-minus in 2006. • Of the final submissions examined so far by EPA, covering about 100 HPV chemicals, EPA has found that data gaps remain in about a third of them. <p>THE HAZARD DATA SUBMITTED ARE SCREENING-LEVEL DATA ONLY</p> <ul style="list-style-type: none"> • Hazard data being collected under the Challenge are limited to a subset of the Screening Information Data Set (SIDS), developed under the auspices of the OECD. • The SIDS data are generally acknowledged to be insufficient to provide the basis for a full hazard assessment, let alone a risk assessment, for a chemical. It relies primarily on testing of acute or subchronic toxicity, for example, and its ecological endpoints only include toxicity to aquatic organisms. <p>THE PROGRAM FOCUS IS LIMITED TO HAZARD DATA</p> <ul style="list-style-type: none"> • By design, the Challenge did not call for submission of use and exposure information, although some sponsors did submit some such information. • As a result, the program will provide little if any reliable, comprehensive information about the use of and exposure to HPV chemicals. <p>EPA HAS LITTLE RECOURSE IF DATA QUALITY IS POOR OR DATA ARE INCOMPLETE</p> <ul style="list-style-type: none"> • Because the HPV Challenge is voluntary, EPA has very limited ability to ensure that the data submitted by sponsors are of high quality and complete. While EPA and other commenters have often identified deficiencies in initial submissions, there is no legal or binding obligation on the part of sponsors to heed those comments. • EPA has agreed to conduct a quality and completeness review on final submissions, and to make known the results, but cannot compel sponsors to address any problems that are identified. <p>THE REGULATORY "BACKSTOP" FOR THE PROGRAM IS WEAK</p> <ul style="list-style-type: none"> • EPA's authority under TSCA to compel testing of the 10% of HPV Challenge chemicals that were not voluntarily sponsored is seriously constrained; to date, EPA has issued test rules for only 16 (6%) of the 265 unsponsored "orphan" HPV chemicals. <p>THE MAJORITY OF CHEMICALS IN COMMERCE ARE NOT HPVS</p> <ul style="list-style-type: none"> • While, as ACC notes, HPV chemicals constitute the bulk of chemicals in commerce when measured by tonnage, non-HPV chemicals far outnumber HPV chemicals. • The TSCA Inventory contains more than 82,000 chemicals that have been in commerce at some point since 1979. Based on the 2002 TSCA Inventory update reporting, EPA reported some 5,400 so-called medium production volume (MPV) organic chemicals manufactured in 2002 in amounts above 10,000 pounds per year; an unknown number of chemicals below that threshold are in commerce in the US, because they are not required to be reported. • The European Union (EU) estimates that about 30,000 chemicals are produced there in quantities at or above one metric ton (2,200 pounds) per year, fewer than 3,000 of which are HPV chemicals. <p>THE EXTENT OF SPONSORSHIP OF NEWLY EMERGED HPV CHEMICALS IS POOR</p> <ul style="list-style-type: none"> • Of nearly 600 newly emerged HPV chemicals – those that have reached HPV levels of manufacture since the Challenge was launched – eligible for sponsorship, only 40% have been sponsored through the chemical industry's Extended HPV Program. • EPA has found wide gaps in publicly available hazard data for these chemicals. • No test plans for these chemicals have yet been made available, and industry has not provided any tracking system to monitor the status of these commitments. • No final data sets have been submitted, despite a claim when the program was launched that data would be submitted starting in 2006.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> • These findings indicate that the chemical industry is not making the development of, and public access, to hazard data on all HPV chemicals “evergreen” practices.
F-C2C-48	<p>Here are some ideas for what California can do to start to advance chemicals policy and promote green chemistry. They are derived from ideas I have presented at several GCI forums, but I wanted to add them into the mix being collected via the Conversation.</p> <p>What can California do?</p> <ul style="list-style-type: none"> • Ensure access to information gathered by others <ul style="list-style-type: none"> – Negotiate for access to confidential business information (CBI) submitted under the European Union’s REACH Regulation and under the Canadian Environmental Protection Act (CEPA) – Require companies making/importing chemicals in California that are subject to REACH or CEPA to submit the same information to California officials – Enhance existing IT infrastructure to receive and share the large volumes of REACH data • Set clear criteria to identify chemicals of concern <ul style="list-style-type: none"> – Can be hazard-based (e.g., PBTs) and exposure-based (e.g., chemicals detected through biomonitoring) – Use these criteria to drive further assessment and control of chemicals meeting the criteria – Require adherence to clear timelines for conducting assessments and making control decisions • Map the flow of chemicals in California by developing and sharing production/use info <ul style="list-style-type: none"> – Require California producers/importers and users to submit and update information on production and processing (amounts, facility locations), uses (including in products), and post-use management – Require updating of MSDSs to reflect all available data (US HPV Challenge, REACH, Canada) – Require disclosure of chemicals in consumer products • Could focus initially on priority chemicals (Canada priority list, REACH Substances of Very High Concern (SVHC) list) • Advance the science <ul style="list-style-type: none"> – HPV, REACH data sets use 20+ yrs. old tests (“old toxicology”) – Fail to account for: <ul style="list-style-type: none"> > Emerging issues, e.g., endocrine disruption, development neurotoxicity > Emerging science, e.g., low-dose effects, timing of exposure during development > Emerging methods, e.g., toxicogenomics, high-throughput screening and mechanistic assays > Perpetual concerns: e.g., cumulative, aggregate exposures, susceptible subpopulations – California is well-positioned to help move toxicology into the 21st century – Can help to develop, road-test and share new methods, testing strategies – Utilize biomonitoring data and methods to advance dose and exposure measurement – Press industry, federal government to move forward – Collaborate with universities <p>Why do this?</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> • Casts a broad net – to identify not only “bad actors” but also chemicals of low concern • Influences and informs chemical and product design decisions • Identifies and fills gaps – information (data and safety) and technology gaps • Empowers a range of actors – government, industry, academics, public – to advance knowledge and make better decisions about chemicals
F-C2C-49	<p>[NOTE: This post is based on a paper I published in the OECD Series On Testing And Assessment, No. 51, Approaches to Exposure Assessment in OECD Member Countries: Report from the Policy Dialogue on Exposure Assessment in June 2005, Chemicals Committee, Organization for Economic Cooperation and Development, p. 109, available at http://appli1.oecd.org/olis/2006doc.nsf/linkto/ENV-JM-MONO(2006)5. It is provided in part to respond to the American Chemistry Council's comments arguing for sole reliance on risk-based evaluation for chemicals.]</p> <p>While both hazard and exposure are clearly relevant in determining chemical risks, there are critical differences between our ability to assess hazard and exposure that have implications for the development and application of risk and exposure assessment policies. And real-world experience in chemical assessment programs that have attempted to rely on exposure information to prioritize chemicals also offers lessons for exposure assessment. In this paper I first address these issues, and then discuss their implications for risk and exposure assessment policies.</p> <p>Critical differences between assessing hazard and exposure</p> <p>Approaches to integrating exposure assessment into regulatory decision-making need to acknowledge and account for a number of critical differences between the nature of hazard and exposure information and their relative extent of availability. While both hazard and exposure are clearly relevant in determining risk, certain characteristics of exposure information pose serious challenges to sound decision-making:</p> <ol style="list-style-type: none"> 1. Hazard is largely inherent to a chemical, and doesn't fundamentally change over space or time, whereas any exposure information necessarily represents only a “snapshot” in both space and time. <p>A chemical's hazard is relatively intrinsic, largely or entirely independent of how the chemical is used, where or how it enters the environment, or other factors that vary with time and place. Hazard data are therefore relevant (i.e., necessary though not sufficient) in characterizing risk whatever the use of a chemical, and hence are useful in understanding any and all potential uses of or exposures to a chemical -- and what kind of exposure-reducing efforts may need to be taken.</p> <p>Just the opposite is true for exposure, the potential for which changes depending on how a chemical is produced, used, transported and discarded. Conditions that determine exposure can and often do differ enormously for every setting and point in time that a chemical is present. And even if a “snapshot” of current exposure were able to be assembled, the next new use or activity leading to a release would alter the exposure picture. The variable nature of exposure poses a major challenge to exposure (and risk) assessment: It means that exposure assessment must be an ongoing activity, with the scope and frequency of its measurement sufficient to characterize the variation in as well as magnitude of exposure.</p> <ol style="list-style-type: none"> 2. Voluntary and regulatory mechanisms for generating and collecting exposure information are undeveloped relative to those for hazard information. Extensive international consensus exists as to how to test a chemical for most hazardous properties. Detailed government-sanctioned procedures, guidelines, criteria and standards are already in place for conducting hazard tests, for assuring the quality and reliability of the results, and for determining whether the results constitute evidence of a particular hazard. Moreover, these measures allow that results are reproducible and can be independently verified. <p>In contrast, virtually none of these mechanisms are in place to assure that exposure information is complete and accurate. Debates over what constitutes adequate exposure assessment and how to address the “moving target” nature of such information are far from resolved. Government-sanctioned procedures for generating, evaluating the adequacy of and interpreting exposure data have yet to be developed or validated, including testing and measurement standards, guidance, methods and tools.</p> <p>Even use and exposure information reported in sufficiently qualitative terms or sufficiently aggregated form so as to eliminate any confidential business</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>information (CBI, see next bullet) concern is rarely systematically collected and made public. For the first time, beginning in 2006, USEPA has begun to require the reporting of basic information relevant to understanding uses of and exposure to chemicals, although it will be limited to several thousand chemicals, and will be collected only once every five years – despite enormous documented variability in these chemicals’ production volumes that presumably reflects changes in their underlying use patterns.</p> <p>3. Differential access to both exposure data and the means to generate them severely limit the “reproducibility” of such data. In addition to the variability and absence of agreed-upon procedures noted above, other factors limit “reproducibility,” that is, the ability to readily and independently measure or verify exposure data. Most exposure data and the means to generate them reside virtually exclusively with industry. It must be acknowledged that industry has a strong interest in maintaining that exposure to its products is low, so the ability to independently measure and verify exposure data is critical. Yet physical access to many exposure “settings” (e.g., workplaces) is very limited and infrequent at best, even for government officials.</p> <p>Broader access to exposure-relevant information is even more restricted: Wide latitude is typically provided to claim chemical use and exposure information as CBI, preventing even its review outside government; this situation is often in contrast to that applying to hazard data, which is more likely to be deemed ineligible from designation as CBI.</p> <p>Finally, even chemical manufacturers have incomplete access to and information on their customers and how their chemicals are used. Intermediaries (vendors, brokers, distributors) are a formidable information flow bottleneck, as is the often-proprietary nature of information concerning downstream use and competition among suppliers. These factors serve to impede information-sharing even within supply chains, which in turn affects the extent and accuracy of exposure-relevant information that any one entity in a supply chain can provide if asked or required to do so.</p> <p>For all of these reasons, we believe that risk and exposure assessment at this time are simply too uncertain and unreliable to serve as a basis for deciding for which chemicals hazard data should be developed. While ultimate decisions concerning risk identification and management need to account for exposure as well as hazard, in all but the most exceptional cases, chemical prioritization approaches should be hazard-, not risk-driven.</p> <p>Difficulty of using exposure information in chemical priority-setting: OECD experience as a real-world example</p> <p>The ongoing work of the OECD Existing Chemicals Program vividly illustrates the limitations to available exposure information – and to efforts to prioritize chemicals based on such information. In that program, chemical-by-chemical assessments of high-production volume (HPV) chemicals are conducted. Typically, industry collects existing information and conducts any testing needed to fill gaps in the required set of hazard information. Industry then prepares draft assessment documents, which are reviewed by health and environmental agency officials in member countries. While the primary emphasis is on hazard assessment, program procedures currently allow for exposure information to be included to “place the hazard information into context.” As we have documented in detail elsewhere, in practice this exposure information is routinely being used to decide that chemicals that have been identified as possessing clearly hazardous properties are nevertheless low priorities for further work based on “anticipated low exposure.”</p> <p>Unfortunately, the exposure information typically being relied upon has truly massive deficiencies with respect to scope, quality and completeness. Such information typically is:</p> <ul style="list-style-type: none"> • very limited in scope, and hence incomplete or even haphazard in its coverage of potential exposures, because it: <ul style="list-style-type: none"> - covers only a portion of known production and use; - covers only a subset of relevant activities, e.g., production, transport, storage, processing, use by customers, use in consumer products, product disposal, waste management; - covers only a subset of exposed entities, e.g., workers, consumers, the general population, sensitive populations, and wildlife; - addresses only a subset of relevant routes of exposure, e.g., by inhalation, ingestion or dermal contact; through food, water, air;

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>- rarely is based on ongoing or sufficiently frequent measurement to address variation or changing conditions;</p> <ul style="list-style-type: none"> • unverified, unpublished, rarely peer-reviewed and of uncertain or undetermined quality; • frequently based on judgment or speculation, rather than on actual measurements, monitoring or validated methods of exposure modeling. <p>Some of these deficiencies are related to the limited requirements under the program governing what exposure information is to be provided. However, others reflect the fundamental characteristics of exposure information described in the first section of this paper, as well as limitations on the extent and quality of information actually available and the capacity for effective review, and the lack of agreed-upon measures of scope, quality and completeness. The OECD Existing Chemicals Program has wrestled repeatedly with this problem over its history. Indeed, because of what many saw as an over-reliance on exposure-related considerations in the absence of an agreed-upon approach, the program went through a major refocusing to return to a primary focus on hazard characteristics as the primary driver for the program. However, despite the refocusing effort, inconsistent and insufficient exposure-related information – more than any other factor – drives the recommendation process for chemicals being assessed through the program.</p> <p>Implications for risk and exposure assessment policy</p> <p>All of the factors discussed above mean that assembling a complete and reliable exposure picture even for a single point in time faces obstacles and has proven exceedingly difficult in practice. So how should risk and exposure assessment policies – and practices – address these current realities?</p> <p>Guidelines development: We continue to strongly support the development of comprehensive guidelines for collection, analysis, validation and presentation of exposure information, as the much-needed foundation of any exposure assessment policy and practice. In our view, the OECD program needs to invest at least the same effort in developing a process for exposure assessment as was invested in developing the hazard screening program. There remain a number of substantial obstacles that must be solved in order to ensure that adequately robust data on exposure can be gathered. Resolving these challenges will not be easy. These obstacles include:</p> <ul style="list-style-type: none"> • lack of agreement as to what exposure information is relevant and needed; • lack of consensus as to the framework and methodologies needed to conduct an exposure assessment; • limited availability of and access to internationally accepted, comprehensive measured exposure information or models for predicting exposure; and • limited information available on all uses and other exposure pathways of chemicals. <p>Guidelines need to ensure that the measured and modeled or estimated data address and are representative of the full range of actual and potential exposures that can or do occur. Procedures are needed to govern, for example, the minimum number of samples, the frequency of sampling, and other parameters so as to ensure that the results of any exposure measurements are both statistically meaningful and representative of the spatial and temporal variations present in the sampled environment. Quality assurance/quality control procedures to ensure data quality are needed. Where data are available for only a subset of production sites/release points/exposure sources, procedures are needed to determine whether and if so how extrapolations from available data can be used to characterize exposures arising from the missing sources.</p> <p>Adequate expert review: Policies need to provide for thorough review of exposure information. This starts with ensuring exposure-related expertise among reviewers is sufficiently diverse to address each of the various relevant exposure settings (workplace, consumer, environmental), and data generated through direct measurement as well as modeling. The review process should yield an explicit assessment of the scope, completeness and quality of the exposure information, in which any conclusions are qualified to accurately reflect the actual extent and nature of exposure information provided and hence the degree of associated uncertainty. Specific factors to be assessed should include:</p> <ul style="list-style-type: none"> • Scope and Completeness: geographic, temporal extent of applicability and associated limitations; to what fraction of total production and use, to what uses, and to which specific facilities, processes, activities and products the provided information applies; which activities associated with the chemical's full lifecycle (production, processing, storage, transport, use and disposal) are covered; whether information on releases and exposures relate to workers, consumers, public or the environment; whether information is based on measurements, modeling, judgment, extrapolation. • Quality: extent of documentation provided/cited; reference to/description of procedures used; representativeness of sampling underlying any

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>measured data; validation of any model used; peer review and extent of access to underlying data; assignment of measures of reliability; reproducibility. Accounting for the variable nature of exposure: Policies need to acknowledge and account for the inherent variability in exposure over time as well as space. For example:</p> <ul style="list-style-type: none"> • For new chemicals, the nature or extent of production, use and exposure needs to be tracked and revisited/reassessed over time, not only as a chemical enters commerce but as its production level and range of uses change. During the initial review/approval process, conditions should be included that require reporting of any changes in the nature and extent of production and use and other exposure-relevant factors, and such reports should trigger a reassessment of exposure potential. • For existing chemicals, policies should also be responsive to changes in the production level or use profile of a chemical. One recent illustration of this need in the U.S. is the change that has accompanied the phase-out of pentabromodiphenyl ether and its replacement with a different chemical, the production and use of which has increased dramatically as a result. <p>Data verification and model validation: To the extent data from industry are relied on, policies need to incorporate mechanisms to ensure and demonstrate that such data are accurate and representative, and wherever possible, to be able to independently verify such data. To the extent that modeled as opposed to measured data are relied on to provide exposure estimates, policies need to outline procedures to be employed to validate the models, provide public access to the models and their underlying data sets. Just as for measured data, policies also need to ensure that models effectively account for variation in exposure over time.</p> <p>Differential access: The differential access to exposure-related information (as discussed above) is a serious barrier to public confidence in both industry- and government-derived exposure assessment. In addition to adopting and abiding by comprehensive guidelines covering all aspects of exposure assessment, government needs to develop and implement mechanisms to demonstrate that it can independently verify the reliability of industry-generated exposure information; and industry needs to be encouraged or required to implement its own measures to increase confidence in the information it provides, including routine third-party review and a commitment to make information public whether exculpatory or not. In addition, policies need to consider means to break through the supply-chain bottlenecks that effectively prevent development of a full understanding of chemical processing and use. In our view, one of the key innovations offered by the European Union's REACH regulation is its intent to compel information-sharing up and down the chemical supply chain.</p> <p>Finally, in our view, serious reconsideration of the currently overbroad broad allowances for CBI claims related to exposure-relevant information is warranted.</p> <p>Transparency: Policies should ensure that any descriptions of exposure information are clear and transparent in describing the scope and nature of the information and its limitations, including by addressing all of the elements specified above under Scope and Completeness and Quality. Policies should require that conclusions or recommendations be carefully written and explicitly qualified so as to limit their perceived and actual applicability to those settings for which information has been provided and deemed sufficient to warrant the conclusion or recommendation. Furthermore, the degree of uncertainty associated with a conclusion or recommendation should be stated and should reflect the extent of exposure information available. Lastly, policies should ensure that in the absence of good exposure information, exposure should be assumed possible or likely.</p> <p>Additional challenges</p> <p>Cumulative and aggregate exposures: A common limitation of exposure assessments in practice is to examine exposures only to single chemicals at single points in time, or from single sources or products, as if they occur in isolation from other exposures that are in fact relevant to understanding the true nature and magnitude of exposure. While understandable given the complexity involved in going further, this frequent failure to consider or even acknowledge the need to ultimately examine cumulative and aggregate exposures undermines the credibility of an exposure assessment. Policies, therefore, need to ensure that an accurate context is provided within which to judge a particular exposure assessment, one that accounts for factors such as:</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> • production, processing and use of the same chemical by multiple entities; • multiple uses of the chemical leading to actual or potential exposures; • multiple routes of exposure (direct, indirect) to a chemical; • continuous or periodic release of or exposure to a chemical; and • exposure to multiple chemicals producing the same/similar effects and/or acting by the same/similar mechanism(s) <p>Biomonitoring/environmental monitoring/health tracking: The ultimate arbiter of the value of exposure assessment is the extent to which its findings comport with reality. It is relatively rare for extensive data from actual environmental and biomonitoring to be available, and rarer still for health tracking statistics to be available that can be linked to particular exposures. Nonetheless, exposure assessment policies should ensure that such data are examined and incorporated where available, and should encourage the development of and public access to such data.</p> <p>Susceptible subpopulations: In addition to variation over time and space, exposure to a chemical or the effects arising from such exposure may differ among particular subsets of human or ecological populations. This variation may be due any number of factors, such as inherent differences in the subpopulations themselves (e.g., children’s respiratory rates are higher than those of adults), differences with respect to proximity to, or reliance on activities associated with, particular sources of exposure (e.g., occupational exposure, dependence on a diet high in fish or groundwater as a drinking water source), or differences in sensitivity to a substance (e.g., sensitization, genetic susceptibilities). (Less understood at present are the analogous differences in ecological subpopulations.) Policies need to account for such variations and ensure protection of the most susceptible and sensitive sectors of potential exposed populations.</p> <p>[end]</p>
F-C2C-50	<p>What if you could have a plastic polymer that you could recycle with the efficiency and a robust system similar to paper and aluminum? Polylactic acid can be hydrolyzed from PLA back into Lactic acid and repolymerized back into PLA. This process does not need complex chemistry to separate copolymers because PLA is a homopolymer and would yield only lactic acid.</p> <p>The end-of-life vision for NatureWorks Biopolymer in the long term is to maintain a journey to zero waste – keeping the Biopolymer, regardless of form, out of the landfill and being able to recycle into the same use or higher valued use if possible.</p> <p>Where food composting infrastructure exists, NatureWorks Biopolymer heavily contaminated with food waste should be composted in those streams to assist with food waste diversion.</p> <p>The ideal for PLA is chemical hydrolysis back into essentially new PLA</p>
F-C2C-51	super cool...i'd like that for my product
F-C2C-52	<p>Ecolab Inc. supports science and risk-based chemical management policies that balance the 'triple bottom line' of sustainability: protection of the environment, assurance of product safety and promotion of innovation in the marketplace.</p> <p>Ecolab encourages the members of the California 'green' committees in the following specifics:</p> <ul style="list-style-type: none"> • Understand both the burdens and benefits of new regulatory proposals. • Find a way to successfully manage both toxicity and exposure (i.e., risk) while providing the solutions California needs. • Utilize risk assessment methods that integrate knowledge regarding potential hazards of chemicals with an understanding of their uses and exposures. • Look for product stewardship and risk management programs that establish mechanisms to assure exposures remain in the safe region for typical uses and foreseeable misuses; and • Enact laws and regulations that: <ul style="list-style-type: none"> • are science-based,

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> • balance potential risks with benefits, • factor in existing scientific knowledge as well as reasonable uncertainties, and • consider the degree of risk to people and the environment." <p>We encourage California to study the availability of data now, particularly the availability of both hazard and exposure data, so that risk determinations can drive decision making. Please coordinate information needs with other governments and other sources of information. Do not reinvent the wheel. Ecolab is in the process of evaluating products/services to evaluate the 'greenness' and 'sustainability' of our products. One of the companies we have evaluated is Chemical Compliance Systems, Inc. (CCS) which specializes in ecological, health and safety compliance, chemical security, and hazardous material management services. CCS has a database containing 220,000 chemicals and more than 75,000,000 data elements comprising 43 key environmental metrics. I first became aware of CCS on June 28, 2007 when I heard Dr. George R. Thompson, President & CEO, giving a presentation called "Web-based Databases That Facilitate Chemical, Product and Process "Green" Assessments and Automated "Green" Cleaning Product Development or Acquisition Assessments" at the 2007 Green Chemistry & Engineering Conference, Washington DC (www.GCandE.org) For products we submitted to them, they organized the results in three categories Ecology, Human Health and Safety in their default product 'report card' which weighs constituent chemicals and their percentages in the formulation. They evaluated and produced 'report cards' on both concentrates and ready-to-use solutions on a number of our products, showing the sensitivity of their approach.</p> <p>The following procedure was used to produce each report card. For each metric, the chemical that is least sustainable/green is given a score zero and the most sustainable/green is assigned 100. The scores in between are normalized so that each chemical (all 220,000) has a quantitative normalized score. They also have a Cross-Reference Dictionary & Regulatory Lists. The Chemical Cross Reference Dictionary contains 550,000 records of purified CAS numbers and their associated synonyms. This file facilitates accurate and complete materials management data searches and product substitution research. The Regulatory List of Lists file is comprised of over 650 international, federal, state and local regulated chemical lists and their associated data, as well as numerous CCS compiled lists (e.g., incompatible chemicals, hazard classes, etc.). CCS' modules compare a single chemical inventory file against these lists and generate a multitude of regulatory reports utilized by logistics, environmental/safety/ health, and chemical security professionals, as well as first responders.</p> <p>I strongly recommend California evaluate CCS's capabilities for application as part of California's Green Chemistry Initiative. I believe California's efforts will benefit from use of CCS's capabilities.</p>
F-C2C-53	<p>Chemistry has enabled the development of countless products that consumers use each and every day, and consumers want to understand what impact these products may have on the environment and on their health. Industry shares this desire, and continues to strive to develop, produce and market products that are both beneficial and safe for people and the environment.</p> <p>Given the complex and multifaceted technical, societal and policy elements that are inherent in the design, manufacture, use and disposal of these products, one must consider a number of factors to effectively assure their safety. Approaches to safety that are performance based and flexible will provide the greatest benefits and allow the development of innovative approaches within the context of California's Green Chemistry Initiative. Industry works to minimize exposure of workers and the public to all chemicals that could be considered hazardous as used, and we pay particular attention to chemicals considered to be hazardous to humans or the environment. At the same time, industry uses chemicals that are least hazardous, and thus require the least expense in worker and public safeguards, consistent with the production of effective and economically accessible products. The two halves of risk--hazard and exposure--are always part of our planning and never far from our minds. Approaches that utilize risk-based evaluations of chemicals to determine efficacy and safety should serve as the foundation for decision making within programs that flow from the California Green Chemistry Initiative.</p> <p>While the toxicity of a substance is an important consideration in a risk based evaluation, the potential for toxicity must be considered in the context of exposure--including exposure level, route, duration and timing. Every substance can produce toxicity under certain exposure conditions. Even common-</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>place substances usually thought of as benign, such as water and table salt, can cause death when ingested at too high a dose over short periods of time. Conversely, even the most toxic substances pose virtually no risk when releases are controlled and exposures are minimized to levels below which, given an adequate margin of safety afforded by risk assessment techniques, the doses will not elicit adverse effects.</p> <p>For example, arsine gas is used to make microcontroller and microprocessor chips, and although arsine gas is highly toxic when inhaled, its “presence” in semiconductor chips in products used in every day life--computers, calculators, appliance microprocessors--poses no health hazards or risks from in-home normal and customary uses.</p> <p>So the question is not just, “How do we control toxic substances?”, but also how do we successfully manage both toxicity and exposure--risk--while providing the solutions society needs? The answers to these questions are best provided through:</p> <ol style="list-style-type: none"> 1) Risk assessment methods that integrate knowledge regarding potential hazards of chemicals with an understanding of their uses and exposures; 2) Product stewardship and risk management programs that establish mechanisms to assure exposures remain in the safe region for typical uses and foreseeable misuses; and 3) Laws and regulations that: <ul style="list-style-type: none"> • are science-based, • balance potential risks with benefits, • factor in existing scientific knowledge as well as reasonable uncertainties, and • consider the degree of risk to people and the environment.
F-C2C-54	<p>After some 34 years working as a Chemical Engineer in the chemical industry I continue to applaud Green Initiatives. Regulatory Initiatives that create bureaucracy have made many differences in every State of this great nation, but they add cost, sometime in the a fair way but normally spread over the general population in a way that seems easy politically but counter productive.</p> <p>It seems to me that if a product consumes xxxBTU/lb then the tax should be on the product when sold so that no matter where in the world it was produced the same tax would be applied. Some manufactures may be more effecient that others but thier competitive edge would not be impacted. In like manner a product creates waste that is considered harmful or toxic the finished product might be taxed based on the waste. Again if a producer develops a new process eliminating the production of toxic waste perhaps they could register for a pass on the tax.</p> <p>Sound like value added tax but perhaps its a green tax as only Green products get a complete pass. The impact is not negative to the State economy because the same tax is paid regardless of where the product comes from.</p>
F-C2C-55	<p>For many years, the Department of Defense (DOD) has made a concerted effort to reduce the potential impact of munition constituent and other chemicals on human health and the environment. In 2000, the U.S. Army Defense Ammunition Center (DAC) began working with Chemical Compliance Systems, Inc. (CCS) to use CSS’s extensive centralized Relational Chemical and Product Databases as the basis for a series of integrated, web-based modules within what has become the Munitions Analytical Compliance Suite (MACS). (CCS’s centralized databases included over 650 regulatory lists.) MACS includes eight modules. In a few months, the 9th and 10th automated modules the Emissions Risk Assessment and Human Health Risk Assessment--will be added. The most comprehensive of the MACS modules is the “Green” Munitions Analytical Compliance System (G-MACS). CCS developed G-MACS for DAC and PEO Ammunition Office in 2003. DAC and CCS co-own G-MACS, which has been available to 13 military munitions demilitarization facilities and two munitions management offices from coast to coast since its development. Military munitions design engineers can use the G-MACS’s 43 quantitative ecological, health and safety criteria (Endpoint Criteria) to eliminate or reduce the use of hazardous munitions constituents to create a theoretical munition composition that substitutes alternative components, parts or chemicals, and calculates the “green” grade for the total, component, or part composition in 5 to 20 seconds. G-MACS can also quickly identify which munition constituents have an impact on any of 112 state, federal or international regulations. This electronic design capability greatly reduces the labor and time required to design a “greener” munition.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>G-MACS also has application to other munitions activities (e.g., acquisition handling, demilitarization). Using a munition's National Stock Number (NSN), G-MACS can calculate a munition's overall "green" grade, its ecological, health and safety scores, and the 43 Endpoint Criteria scores within five to 10 seconds. Because all scores are normalized on a scale from 0 (worst) to 100 (best), comparisons of the "greenness" of two (or more) munitions is easy and quantitative. The evaluator can view individual scores, from worst to best, as a means to determine those constituents that need to be replaced to improve the "green" grade.</p> <p>When G-MACS is combined with CCS's proprietary "Green" Process Analytical Compliance System (G-PACS) the four stages of a product life cycle (i.e., design; manufacture; stockpile management [e.g., handling, transportation, storage]; and disposal) can be evaluated. G-PACS uses the same 43 Endpoint Criteria as G-MACS, but analyzes the chemicals used in each step of the manufacturing process, or wastestream, rather than the constituents used in a munition.</p> <p>The MACS Chemicals of Concern (MACS-COC) module combines the objective and quantitative 43 Endpoint Criteria with quantitative Regulatory Impact and Inventory On-Hand Criteria to calculate a ranked Level of Concern listing for any facility's inventory. This prioritized list can be beneficial in decision making, particularly in regard to inventory management, pollution prevention, and cleanup.</p> <p>I strongly recommend California evaluate CCS's capabilities for application as part of California's Green Chemistry Initiative. I believe California's efforts will benefit from use of CCS's capabilities. CCS's web-based capabilities, their innovative approach, and their willingness to develop new or modified, integrated capabilities has proven beneficial to the Army's efforts to both be good stewards of the environment and to implement its sustainability program. Although I have not used them, I am aware of CCS's non-munitions capabilities, and believe that they would prove to provide tools of value to the civilian community and decision makers.</p>
F-C2C-56	<p>Is more data always better when it comes to understanding chemical safety? In many cases, the answer is yes, but when making this determination, it is important to understand the difference between a "data gap" and a "data need."</p> <p>WHAT DATA IS NEEDED?</p> <p>The U.S. EPA has clearly distinguished "data gaps" from "data needs" in the past. Data gaps are areas that could benefit from additional data, additional analyses, or clearer presentation, while "data needs" are data gaps requiring additional work before the potential risks can be adequately characterized – an important distinction to keep in mind.</p> <p>As was discussed at OEHHA's October 1 – 2 workshop on "Practical Decision-Making Tools," there are many models, tools, and guidance on structure-activity relationships to provide California with a tremendous amount of knowledge about chemicals without performing direct testing. The Canadian chemical prioritization under its Environmental Protection Act (CEPA) discussed at length in the workshop made extensive use of such modeling. The oft-touted EU REACH system initially proposed broad new testing mandates, but in its final version, the regulation backed away from that in deference to concerns over animal welfare. Sound scientific decision-making does not require the blunt approach of mindless box checking that only serves to require unnecessary data and animal testing, and burdens already strained public and private resources. Simply requiring unnecessary testing would only serve to put California seriously out-of-step with scientific consensus in the U.S., Europe, and the 30+ member countries of the Organization for Economic Co-operation and Development (OECD).</p> <p>WHAT CAN CALIFORNIA DO?</p> <p>1. California should begin its assessment of information needs by first leveraging the information that already exists on chemicals. This includes accessing the information publicly available on High Production Volume (HPV) chemicals. Through the groundbreaking HPV Chemical Challenge Program, the OECD ICCA HPV program, and industry-led extensions of that work in the US, the chemical industry has already made and continues to make more information publicly available on more chemicals than any other voluntary or regulatory program globally. HPV chemicals in this program represent more than 95 percent of the U.S. market for commercial chemicals by volume. The information provided covers 17 endpoints internationally</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>agreed by the OECD member countries as sufficient to initially assess chemical hazards including physical/chemical properties, environmental fate, ecotoxicity, and hazards to human health. Although this database is still being populated, there is a wealth of data and a solid platform from which the state of California can prioritize chemicals of interest, and evaluate further information needs.</p> <p>2. Additionally, the HPV hazard data will be soon be supplemented with the information required by EPA's Inventory Update Rule. Specifically, in 2006 chemical manufacturers and importers of chemicals with site-specific annual production of 25,000 pounds or more were required to submit the following information for chemicals manufactured or imported in calendar year 2005:</p> <ul style="list-style-type: none"> • Basic company and facility site information • Chemical identify information • Specific chemical production volume • Chemical site limited status • Number of workers reasonably likely to be exposed to the chemical substance at the site of manufacture or import (in prescribed ranges); • Physical form(s) of the chemical substance as it leaves the submitter's possession, along with the associated percent production volume; and • Maximum concentration of the chemical substance as it leaves the submitter's possession (in prescribed ranges). <p>In addition, manufacturers and importers of chemicals with site-specific annual productions of 300,000 pounds or more were also required to provide the following production and use information:</p> <ul style="list-style-type: none"> • Application - North American Industrial Classification System ("NAICS") codes that best describe the industrial activities conducted by the sites that use or process the substance; • Industrial functions of the chemical substances; • Approximate number of processing and use sites; • Estimated number of workers reasonably likely to be exposed to each chemical substance at all sites at which the chemical is used or processed; • Commercial and consumer uses of reportable chemical substances <ul style="list-style-type: none"> o An indication of whether the commercial/consumer products are intended for use by children; o Maximum concentration of the reportable chemical substance in each commercial and consumer product category; and • Estimated percentages of the submitter's production volume in each industrial function category and commercial and consumer product category. <p>A compilation of the IUR information will be made publicly available by EPA sometime by the end of this year, and will provide the core of basic chemical "mapping" data discussed in recent Green Chemistry dialogues.</p> <p>3. California should also work now to understand how it can leverage the regional chemical cooperation program recently announced by Canada, Mexico and the United States under the Security and Prosperity Partnership (SPP). The SPP program will leverage the information Canada has produced under its Chemical Management Program, and the related CEPA priority-setting. In addition, the U.S. has committed that by 2012 it will assess and initiate any action necessary on more than 9,000 existing chemicals produced in the U.S. This will include both HPV chemicals and Moderate Production Volume (MPV) chemicals.</p> <p>WHERE CAN CALIFORNIA GET THIS DATA? Identified below are websites where California can obtain a significant amount of information on chemicals that already exists. The HPV Challenge data is available at:</p> <ul style="list-style-type: none"> • http://www.epa.gov/hpv/pubs/hpvrstp.htm <p>A more user-friendly version of the above referenced database is being built, and should be complete later in 2007. An initial version of that database is</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>available now at:</p> <ul style="list-style-type: none"> • http://www.epa.gov/hpvis/metadata.html. <p>Recently, the chemical industry announced that it is extending its work on HPV chemicals - calling it the Extended HPV Program or EHPV. The EHPV Program broadens the original initiative by calling on companies to provide health and environmental information on 573 chemicals that have become HPV since the initiation of the Challenge Program, and increases the scope of information requested for all sponsored HPV chemicals by asking companies to provide use and exposure information. Information from this program will be submitted to the EPA over the next four years. Additional information is being generated under the Voluntary Children's Chemical Evaluation Program (VCCEP), in which USEPA evaluates both hazard and exposure information submitted by companies which have volunteered to determine potential effects on children's health. This information is publicly available at:</p> <ul style="list-style-type: none"> • http://www.epa.gov/chemrtk/vccep/index.htm <p>Beyond the databases for these voluntary programs, there are numerous other publicly available government databases. The Toxic Substances Control Act Test Submission database, TSCATS, is a central system for the collection, maintenance, and dissemination of information on unpublished technical reports submitted by industry to EPA under TSCA. Studies on over 8,000 chemicals are categorized into three broad subject areas (health effects, environmental effects, and environmental fate). Searches can be conducted using these subject areas as well as indexing terms.</p> <ul style="list-style-type: none"> • http://www.syrres.com/eSc/tscats_info.htm <p>EPA and its Office of Research and Development maintain an electronic database called the Integrated Risk Information System (IRIS) and it contains descriptive and quantitative information on human health effects that may result from exposure to various chemicals in the environment. IRIS was initially developed for EPA staff in response to a growing demand for consistent information on chemical substances for use in risk assessments, decision-making and regulatory activities. Information in IRIS is intended for those without extensive training in toxicology, but with some knowledge of health sciences. The heart of the IRIS system is its collection of computer files covering individual chemicals.</p> <ul style="list-style-type: none"> • http://www.epa.gov/iris/ <p>The European Chemical Substance Information System (ESIS) is an electronic system that provides information on both new and existing substances in the EU. It includes proposed classification and labeling for 3,300 chemicals, information and data for roughly 2,500 EU HPV chemicals and final risk assessment reports for chemicals with completed assessments.</p> <ul style="list-style-type: none"> • http://ecb.jrc.it/ESIS/ <p>The EU's REACH legislation will eventually make available hazard data on all chemicals in the European market, as well as use-specific chemical risk assessments for chemicals on the European market above a specific threshold. Data will be publicly available, fully searchable, and formatted in software known as IUCLID.</p> <p>The International Council of Chemical Associations has committed to submit data and assessments for 1,000 global HPV chemicals to the 30 developed nations of the OECD for government assessment. To date, 667 chemicals have been assessed under the OECD program and work is continuing. OECD assessments are published as soon as they are completed on the OECD website. The data included in those assessments are also available, via the United Nations Environment Program (UNEP).</p> <ul style="list-style-type: none"> • http://cs3-hq.oecd.org/scripts/hpv/ • http://www.chem.unep.ch/irptc/sids/OECD/SIDS/sidspub.html <p>The EXICHEM database is a pointer system on current, planned and completed activities on existing chemicals in OECD member countries and other relevant bodies. It was created to provide information for the OECD member countries on "who is doing what with which chemicals", (e.g. information gathering, testing, evaluation), in order to assist countries that are identifying opportunities for co-operation.</p> <ul style="list-style-type: none"> • http://webdomino1.oecd.org/ehs/exichem.nsf

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>The International Program on Chemical Safety (IPCS - a joint program of UNEP, ILO and WHO) developed INCHEM - a freely available collection of internationally peer-reviewed documents about chemicals and chemical safety. It was initiated in 2003 in response to priorities established by the Intergovernmental Forum on Chemical Safety (IFCS) and provides convenient worldwide full-text electronic access to chemical safety-related documents provided by intergovernmental organizations. All documents referenced by INCHEM contain hazard information and the site can be queried by key-words and free text. INCHEM contains Environmental Health Criteria documents, and cancer assessments by the International Agency for Research on Cancer.</p> <p>• http://www.inchem.org/</p>
	<p>California does not need to build a monstrous new regulatory regime to additionally manage risks from chemicals. Instead, it should focus on 1) building knowledge needed to make better life cycle based decisions and 2) supporting entrepreneurship to implement advances. See Part II of my comments below.</p> <p>But first, a satiric set of steps for the “final solution” for California:</p> <p>I. Creating The Country Of Green California</p> <ol style="list-style-type: none"> 1. Secede from the US and form the country of Green California (GC). The country’s motto will be “Sustainability Above All.” 2. Prohibit manufacture and import of any product without prior registration, review and authorization by the government of GC. A base set of test data is required – as in REACH – with the possibility of additional testing as the reviewers may want. Only products deemed to be “green” will be approved for use for a period of two years, after which a new review and probably additional testing will be required since the definition of “green” will have changed in two years. Staff will be drawn from UC Berkeley, who will define “green,” the base set of data that must be submitted, and make decisions to authorize sales as they think is appropriate. There will be no right of appeal. (A border wall may be required to prevent smuggling.) 3. Require all agriculture and manufacturing operations to be “organic” and sustainable, as defined by the staff at UC Davis and UC Berkeley, respectively. 4. Prohibit personal cars, as they are the scourge of GC’s environment. All existing personal cars will be confiscated and recycled. GC will use the scrap sales to purchase zero emission cars for designated essential government personnel. All other citizens must use mass transit. 5. Prohibit all waste disposal (except for incineration in permitted zero emission facilities for energy recovery). All materials must be reused, recycled or stored safely for future use and recycle. This will support a robust barter economy for GC citizens and reduce the amount of new products (that are authorized under CAL-REACH). Illegal disposal will be punished by deportation. 6. GC will be self-sufficient and sustainable in energy and water use. Each citizen will be given an annual ration of energy and water, proportionate to the population (after allocation for government use made). 7. Population reduction: It is expected that the above restrictions will result in a significant migration out of the country of Green California. In addition, illegal immigration is likely to cease because the economy of GC will be unstable for a significant period of time. If insufficient numbers of people leave GC, it may be necessary to limit the number of children to two per family unit. 8. Professors at UC Berkeley will report to the president of Green California on the options available to prevent further degradation of GC’s environment (e.g., air pollution, global warming) by other countries, such as China or the United States. The options will include both political (e.g., declaring war) and technical (massive fans along the borders) solutions and their net impact on the sustainability of Green California. <p>Final Solution: California becomes a self-sustaining island (an island, at any rate.)</p> <p>II. Supporting the Future</p>
F-C2C-57	California would best serve its citizens by supporting continued movement toward greener chemistry in two areas:

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>1. Building Knowledge: California has incredible public and private higher education resources. These should be supported fully and directed toward better understanding the ecosystem, developing new technologies (especially in energy generation and utilization), and educating the public so we can make better decisions and implement solutions to known and future issues. This initiative is focused on chemicals – man-made chemicals – but the issues in need of research and development extend beyond how chemicals interact in the environment and impact health. Scientific, medical, social, political, economic, technological actions all impact the ecosystems of earth. We need to understand how we can intentionally and unintentionally change the system to reduce adverse impacts. We also need to understand where the biggest threats to health and the environment come from because we can never eliminate all risks.</p> <p>I do not believe “toxic” chemicals represent the biggest challenges we should spend our limited risk reduction resources on. The real issue is our ignorant misuse of chemicals – we inefficiently use chemicals as fuels, make consumable products we don’t really need and then release them into the environment without thinking about the consequences. California should build knowledge in all its citizens and businesses about product stewardship and life cycle thinking to achieve responsible development and use of chemicals in products.</p> <p>2. Supporting Entrepreneurial Effort: Engage the business creativity resources in the state in a Sputnik/Man on the Moon effort by providing economic incentives to develop and implement solutions to our biggest challenge: sustainable energy. We need low impact energy sources and high efficiency energy utilization technologies. Support invention; don’t suppress it.</p> <p>Do not create duplicative, expensive and inefficient review and approval processes that will drag down the already challenged California and national economies. “Toxic chemicals” are not a significant threat to public health – poverty is.</p> <p>Georjean Adams EHS Strategies, Inc.</p>
F-C2C-58	<p>The United States Army Defense Ammunition Center (DAC) has partnered with Chemical Compliance Systems, Inc. (CCS) to develop munition analytical compliance capabilities for the past eight years. Along with other DOD organizations, in 2003, DAC contracted CCS to develop a tool that would assist the Army in efforts to assess munitions from a “green” perspective. What came out of this was a Web-based tool known as the “Green” Munitions Analytical Compliance System, or G-MACS. Since no green criteria had previously been established for munitions, or any other product, the development of G-MACS by CCS with 43 ecological health and safety “green” criteria made a giant step forward in helping our design and manufacturing installations with an automated capability to assess the “greenness” of munition constituents early in the life cycle. The “green” scoring criteria in G-MACS was programmed to be flexible and dynamic enough to be modified as needed to support any environmental factors and/or guidelines on “greenness” that might be developed. G-MACS is unique in that it can, in combination with the CCS “Green” Process Analytical Compliance System (G-PACS), be used to “score” a munition for “greenness” throughout the life cycle (cradle to cradle).</p> <p>G-MACS, along with other CCS systems such as their "Green" Product Compliance Analytical System (GP-CAS), and "Green" Process Analytical Compliance System (G-PACS), could be utilized to provide a complete life cycle “green” product measuring tool that not only covers munition constituents but also, paints, pharmaceuticals, cleaning products, pure chemicals, etc. After a number of years of working with CCS and knowing the tools that they developed such as MACS and G-MACS, DAC is confident that the State of California could benefit by utilizing CCS and their GP-CAS, G-PACS and G-MACS Web-based tools.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
F-C2C-59	<p>The California Green Chemistry Initiative is defined by DTSC as an effort to stimulate a “transformation in the design of products and processes.” Interestingly, DTSC’s leading recommendation for bloggers (“...Consider public health and the environmental effects of chemicals during the process of designing products and industrial processes...”) could have been lifted directly from the American Chemistry Council’s Responsible Care® product stewardship program – a program which has been in place since 1991, more than 15 years before California’s initiative. All members of the American Chemistry Council, which represents the leading companies engaged in the business of chemistry, participate in Responsible Care® as a requirement of membership in ACC.</p> <p>“Green chemistry” is product stewardship done right. It is the practice of making health, safety and environmental protection an integral part of the full life cycle of chemical products, including design and manufacture. Under Responsible Care®, this includes evaluations of chemical products and their uses to help assure that those products deliver their intended benefits to society while protecting public health and the environment. Responsible Care® requires our members to employ rigorous management systems that are certified by third-party auditors. In addition to numerous other elements, those auditors certify that our companies have systems to manage risk associated with chemical products and that those systems include management of product development, transport, use and disposal in a safe and secure manner. Companies are also audited on their programs to protect the environment and conserve programs, as well as processes to dialogue with stakeholders about the organization’s impact on human health and the environment. Companies’ performance under Responsible Care® is publicly shared with the public through a first-of-its-kind website: americanchemistry/responsiblecare.com.</p> <p>Reducing hazardous materials in products and processes is also simply good business sense. Hazardous materials cost companies money in additional storage, transportation and disposal fees, as well as additional cost for protecting their work force through engineering controls and personal protective equipment.</p> <p>DTSC and the public can obtain more information on what the chemical industry has been doing in the Responsible Care® program from http://www.responsiblecaretoolkit.com.</p> <p>It’s critical that DTSC’s recommendations to CalEPA in the Green Chemistry Initiative recognize the value and role of industry stewardship programs, and create incentives for others to take similar steps. This is particularly true through the entire value chain, up to and including end users of chemicals and the products made from chemistry.</p>
F-C2C-60	<p>I recently returned from Beijing and I noticed that a Chinese couple purchased a toaster without a box. The clerk simply handed a toaster in a plastic bag. I also noticed toothpaste are also being sold without a box. I discovered that there is very little retail packaging since the goods are being directly shipped to the retail stores from the factories in "reuseable shipping containers" which translate into very little packaging waste. The reuseable shipping containers were returned by poor people on bicycles. I could not help wondering why we could not reduce our packaging requirements for goods which will also reduce the transportation’s emission footprint, landfill waste, manufacturing of packaging, and associated energy costs.</p> <p>In any case, I suggest DTSC look at foreign cities with high population density for new ideas and processes in green chemistry. The rationale is that people living in high population density will most like be affected by toxic chemicals. Therefore the local government must have</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>more stringent controls or innovations to deal with toxicity problems. We should not rely on experience in California or the United States alone for ideas in green chemistry alone. Is DTSC ignoring possible innovations and knowledge that are being developed in South America, Asia, and other continents? I always believe that SF and LA will be like Beijing when the US population growth increases. When I visit other foreign countries, I discovered that people do things completely different. Is the US EPA involved in acquisition of foreign experience and knowledge? If not, perhaps California should think about going international.</p> <p>Victor M Chan, PE, BCEE Solano County Environmental Engineer</p>
F-C2C-61	<p>The regulations need to be modified to allow and expand recycling or reclamation activities at the generating facility so that streams can be re-introduced back into the process as feedstocks or raw materials without requiring a Part B or tiered permit. EPA is currently proposing revisions to the definition of solid waste under 40 CFR Parts 260 and 261 to exclude certain hazardous secondary materials from regulation under Subtitle C of the Resource Conservation and Recovery Act (RCRA). Federal Register: March 26, 2007 (Volume 72, Number 57). DTSC needs to be proactive and prepared when EPA adopts these changes. Benefits: reduction in raw material usage, reduction of transportation of raw materials and hazardous waste on public roadways, and reduction of hazardous waste generation.</p>
F-C2C-62	<p>The business of American chemistry is built on fundamental science. As a result, the members of the American Chemistry Council (ACC) support science and risk based chemical management policies that simultaneously protect health and the environment, assure product safety and promote innovation in the marketplace. Our industry has always relied upon innovation in its development of products and processes to meet customer needs and expectations, address new regulatory requirements, and to fulfill voluntary commitments to programs that go beyond the law. It's important to note that "Green Chemistry" is a way of doing business was never intended to be applied as a government mandate through regulation or legislation. Indeed, the American Chemical Society's Green Chemistry Institute states:</p> <p>"Green Chemistry differs from previous approaches to many environmental issues. Rather than using regulatory restrictions, it unleashes the creativity and innovation of our scientists and engineers in designing and discovering the next generation of chemicals and materials so that they provide increased performance and increased value while meeting all goals to protect and enhance human health and the environment."</p> <p>So how should California approach green chemistry? We think there are a number of threshold issues DTSC must be prepared to address in making recommendations on the basis of this initiative:</p> <ol style="list-style-type: none"> 1. Make a baseline assessment of chemical information that is already available to the State. In ACC's view, there is a lot of information already publicly available on chemicals in commerce, and a lot more coming on line, from other States, the federal government, foreign governments, intergovernmental organizations, and even non-governmental organizations (including industry). DTSC should be studying the availability of data now, particularly the availability of both hazard and exposure data, so that risk determinations can drive decision making. It simply makes sense for California to coordinate on information needs with other governments and other sources of information – why reinvent the wheel? More importantly, DTSC doesn't have to wait until the end of its Green Chemistry Initiative to get the ball rolling on this important element. 2. Reiterate the commitment that the Green Chemistry Initiative will be governed by science. Many entries in the "Conversation with California" appear to be based on an underlying assumption that the current design of products and manufacturing processes is not adequately protective of health and

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>the environment, and recommend that DTSC suggest hazard-based approaches to decision making. That's not good policy. As DTSC acknowledged in the launch of the Initiative, science should govern the process. Americans (and Californians) are living longer, healthier, and safer lives than ever before, and significant improvements have been made in public health and the environment. An extensive legal and regulatory framework, coupled with myriad voluntary programs, initiatives and innovations, has led to those advances in health and the environment. We hope that the Green Chemistry Initiative will examine the basis for the assumptions about the adequacy of current protective measures as policy options are identified.</p> <p>3. Commit to understand both the burdens and benefits of new regulatory proposals. One University of California report on chemical regulation in California noted that businesses in California labor under a "labyrinth" of rules enforced by a number of agencies. Interestingly, many of the entries in the "Conversation with California" argue that even more regulation is necessary! Some have referred to Europe's new REACH regulation as the solution – taking the interesting position that a regulatory program that is not yet even operating is now a benchmark for chemical regulation.</p> <p>4. Acknowledge that engineering is a part of "green chemistry." ACC member companies are leaders in green chemistry and green engineering in their operations and have been honored for their efforts. Modifications in process technology have significant potential to minimize possible adverse health or environmental effects of chemical substances. Many of the entries in the "Conversation with California" appear to focus largely on promoting product substitution – the simplistic substitution of one hazardous chemical for a less hazardous alternative – without regard to the consequences of such an approach, and without recognizing the important role that process improvements can have. It's time DTSC made clear in this dialogue that engineering is every bit as important as product improvements.</p> <p>ACC and its member companies believe that the Conversation with California should address a number of the complex, specific issues that are implicated by the Initiative. In the weeks ahead, we intend to address issues like the role of product stewardship, the role of regulation in promoting innovation, how California might stimulate "green chemistry" and "green engineering", and the four broad categories on which DTSC has invited specific comment.</p> <p>Mike Walls Managing Director, Regulatory and Technical Affairs American Chemistry Council</p>
F-C2C-63	<p>A database has been created with over 220,000 chemicals (all listed to date) and all cross reference names with filters for all state and federal regulatory lists. Each chemical has assigned the 33 federal EPA Environmentally Preferred Characteristics (EPP) and additional credible Characteristics given by regulatory agencies CAL EPA, other key USA states and key countries totaling 41 key environmental performance characteristics (e.g. LD 50, excess lifetime cancer risk, flammability, health hazard indices etc). These characteristics may be organized into three categories Ecology, Human Health and Safety. This database, updated annually, contains over 75,000,000 elements to rank products as a function of the chemicals and chemical percentages.</p> <p>For each environmental characteristic, the chemical that is least compatible with living systems is given a score zero and the most compatible the score one hundred. The scores in between are normalized so that each chemical (all 220,000) has a quantitative normalized score.</p> <p>The navy tested eight adhesives meeting MIL-SPEC by providing the chemicals that make up the products. The chemicals were transmitted via the on-station web site database of products Hazardous Material Management System (HMMS) to Chemical Compliance System's (CCS; www.chemply.com) web site. A report of all 41 Environmental Characteristics was automatically generated, and with equal weights as the default mode, a normalized score for Ecology, Human Health and Safety and an overall Environmental Score (Green Rank Score to make the best decision for the environment).</p> <p>This tool may be used for face cream, road paint, military aircraft munitions or paint, any product with a list of chemicals and percentage created a true quantitative score.</p> <p>This tool may be utilized by academia, government, industry, householders, military etc to formulate-design and or determine the best products compatible with the ecology, human health and safety.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>The vision is that the state of California purchases the tool for the USA to be utilized for no cost by all so that the environmental may improve rapidly. This would become the biggest pollution prevention project ever and the most cost effective to reduce pollution through source reduction. The federal EPA may also participate. With this tool in place via a web site sponsored by CAL EPA and or FED EPA, the products most compatible with the ecology, human health and safety may be chosen by the consumer. Also, formulations by academia, the government, industry etc may be optimized for environmental compatibility. The user simply inputs the chemical makeup of a product and the web site generates a complete report of the EPA EPP characteristics (and others from the key state and countries if desired) and a normalized score for the ecology, human health and safety and a total environmental score (green rank). This would be easy to put the information into a green label.</p> <p>Dr. George Thompson, PHD in Chemical Engineering developed this tool taking over 25 years for the DOD through a company www.chemply.com. The rest of the nation should benefit from this significant work.</p>
F-C2C-64	<p>Legislative Changes</p> <p>I have conducted research on safer alternatives for the last 30 years. Over the last 17 years, my organization, the Institute for Research and Technical Assistance (IRTA), has identified, tested, developed and demonstrated safer alternatives in a range of different applications and industries. Over that period, IRTA has assisted hundreds of facilities in California in adopting alternatives. IRTA has worked on alternatives in dry cleaning, repair and maintenance cleaning, handwipe cleaning, batch loaded cold cleaning, electronics cleaning, vapor degreasing, printing cleanup, paint stripping, coatings and adhesives. In some cases, whole industries have adopted alternatives developed and tested by IRTA.</p> <p>Over the course of this work, I have learned much about how the system works and have become aware that, in order to ensure that safer alternatives are used, legislative changes are required. First, California needs a California Toxic Substances Control Act (CAL TSCA). CAL TSCA would require all new chemicals sold into California to be tested for toxicity before they are marketed. A set of toxicity tests that would be required would be developed by a consensus group of toxicologists with input from DTSC and the public. The manufacturers or distributors would have to conduct these toxicity tests at their own expense. CAL TSCA would also establish a set of toxicity tests that would be required for existing chemicals, chemicals that are already being used and marketed in California. In a few cases, the toxicity test information would already be available; in other cases, the tests would have to be performed. When the toxicity test data were provided by the manufacturers or suppliers, DTSC, with the help of the Office of Environmental Health Hazard Assessment (OEHHA), would evaluate the results and decide whether the chemical could be marketed (new chemicals) or whether the chemical would have to be removed from the market (existing chemicals). The criteria for deciding on this up or down vote would be predetermined by the group of toxicologists who designed the tests and DTSC with public input.</p> <p>Many chemicals that have toxicity problems have come on the market in the last 10 years. These chemicals are used extensively and exposure of workers and community members is high. An example is n-propyl bromide (NPB). NPB is a reproductive toxin in animals and has also caused nerve damage. It is currently undergoing testing for carcinogenicity. When the chemical was first marketed, EPA did not require toxicity testing for the substance under Federal TSCA. The chemical has been listed on California's Proposition 65 but is not on the state toxics list. Cal/OSHA and Federal OSHA have not established worker exposure levels for the chemical. NPB is used in vapor degreasing. The dry cleaning industry is considering using it as a dry cleaning solvent and there is nothing that would prevent this. Once chemicals like NPB are on the market, there is no mechanism for preventing their use in dispersive applications. Adopting a CAL TSCA would allow the state to deal with chemicals like NPB.</p> <p>Second, OEHHA has the responsibility of determining whether chemicals pose an unacceptable risk and that agency has few resources. OEHHA's budget should be expanded substantially. Dry cleaners in the state have been using a dry cleaning solvent called D5 for several years and D5 has caused cancer in laboratory animals. OEHHA has been evaluating toxicity test results to determine whether D5 is a threat but has not completed their analysis. In the meantime, no regulatory agency can regulate D5 and the dry cleaning industry is using it extensively. Giving OEHHA more resources could speed the evaluation process and give high priority to the new work the agency would be called upon to do under CAL TSCA.</p> <p>Third, the California Air Resources Board (CARB) is limited in their regulatory authority and their authority should be expanded. CARB regulates</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
	<p>consumer products but is forbidden from regulating away a whole product type. In other words, if a low-VOC or low toxicity nonaerosol product is available and could substitute for a higher VOC more toxic aerosol product, CARB cannot regulate the VOC content or toxicity of the aerosol product on that basis. CARB can set a lower VOC limit or ban certain toxics in the aerosol product if there are other aerosol products with lower VOC content or no toxics. Aerosol products are inherently not green. They lead to a very large waste stream and they rely on propellants that are often VOCs or greenhouse gases. As an example, consider antiperspirants and deodorants. Roll on products have very low or no VOC content. In contrast, aerosol products have a higher VOC content and contain propellants that may be greenhouse gases or VOCs. Expanding CARB's authority would permit the agency to establish VOC and toxics limits based on the nonaerosol products. This would allow the state to forbid the use of aerosol products in cases where there are greener products. It would also allow CARB to forbid the use of certain toxics as determined under CAL TSCA as a threat. The three legislative suggestions described here would make it far easier to restrict the use of certain materials that cause problems for health and the environment. The strategy would provide an incentive for manufacturers and suppliers to find and market greener products. This would result in better protection of the health of consumers and workers and of the environment in California.</p>
F-C2C-65	<p>Endocrine disruption may ultimately prove to be more impactful on human and animal health than toxicity. The following is a link to a list of possible endocrine disruptors. http://www.silsoe.cranfield.ac.uk/ieh/pdf/w20.pdf This report is eye-opening.</p>
F-C2C-66	<p>Green chemistry is not only about developing a means to identify and avoid chemical hazard, but it is also about implementing a prohibition or use restriction when necessary to protect human and animal health. Clearly, in some cases, such as fire safety and toxic fire retardants, toxicity and ecotoxicity must be weighed against benefits of crucial importance like burn injury and death. In the case of fire retardants in furniture, the authority to make determinations regarding prohibition must be made in a transparent process that is informed by peer-reviewed research conducted under the highest standards. A process of this nature has been drafted and is pending on the California Senate floor in the form of AB 706 (Leno). That process leaves to the fire safety experts at the Bureau of Home Furnishings the decisions related to prohibitions within their jurisdiction while requiring that the toxicologists at the Office of Environmental Health Hazard Assessment make decisions regarding what chemicals are selected for risk assessment. AB 706 can be viewed as a pilot for the 2 primary approaches to chemical regulation:</p> <ol style="list-style-type: none"> 1. Prohibited until proven safe. Brominated and chlorinated fire retardants have a preponderance of evidence of serious health risks. It is not prudent to public safety to proceed with unregulated usage until they are proven safe for use in furniture. 2. Permitted until proven unsafe. All other components or chemicals that are used to meet furniture fire safety standards are permitted, but may have to undergo a toxicity risk assessment if serious health questions arise. <p>A petition process, that enables anyone with data to petition the state to consider if a risk assessment is necessary is a crucial piece of the regulatory process. Authority has been broadly granted by the Legislature to state agencies to protect public health, but actions that come at a cost to industry (and the most important actions nearly always do) are commonly delayed or never acted upon. This is why the threat of environmental toxins is so serious. Green chemistry should never be an excuse to delay prudent action necessary to protect public health. Government's highest responsibility is to protect the health and safety of its citizens. We can only hope that in addition to an adherence to high scientific standards, there is also a big dose of courage among decision makers.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (FORUM)	
Number	Full Comment
F-C2C-67	<p>First, protect the contents of the cradle! The emergence of endocrine disruption understanding requires major changes in the way that industry should develop new products and processes with both major regulatory and separate but related scientific challenges.</p> <ul style="list-style-type: none"> • Do not saddle GC with the destructive burden of being the excuse not to regulate!—you will hurt the field! • Do not rely on risk analysis—instead develop legally binding EDC toxicity assays. • Ban all known EDCs ASAP—help industry make the transition • Encourage expanded R&D at the EDCs/Green Chemistry interface.
F-C2C-68	<p>How about "Green Chemistry Shares"?</p> <p>An industrial plant would receive a given number of GC Shares, based on an evaluation of their operation (according to Green Chemistry Criteria that have been specified). Over the years they have to show improvements in these specified areas (overall reduction of shares: 10% over 5 years or whatever); if they do better than that, they can trade the GC shares with other companies.</p> <p>Benefits: clear criteria are established; allows and anticipates future needs of CA; industry can self regulate where and how to reduce GC shares</p>
F-C2C-69	<p>A complete product footprint that addresses Energy usage, greenhouse gases produced, multimedia wastes generated during the phases of production (including raw material procurement/mining etc.), normal usage of the product (impact parameters during usage to be on a per unit time basis) and in the end of life ultimate disposition will be a good step in the right direction...</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-1	<p>American Chemical Society Response</p> <p>Cradle to Cradle: Through product design and industrial innovation, produce products that reduce the use of harmful chemicals, thus generating fewer emissions and less waste. How do you think California should move to a Cradle to Cradle framework?</p> <p>California needs to carefully review and identify with stakeholders the current significant barriers that impede investment in, and adoption of, sustainable technologies. Although the long-term economic benefits of sustainable technologies, such as reduced regulatory and waste disposal costs, can be significant, businesses can be placed at a near-term competitive disadvantage because of potentially prohibitive, up-front costs. Regulations need to be revised to allow flexibility for the superior environmental performance obtained when clean technologies are employed.</p> <p>To effectively address this dilemma, ACS believes that governments should provide incentives for the implementation of sustainable technologies, as explained further by our answer to the green chemistry question.</p>
F-GC-2	<p>Use of Existing Web-Based Tools to Certify "Green" Cleaning Products</p> <p>Industrial cleaning product constituent chemicals have a wide spectrum of potential effects on human health and the environment. Manufacturer employee, product user, and cleaned building resident exposures potentially encompass both acute and chronic health risks. Selected products and processes also manifest safety risks (e.g., fire, explosion, incompatibilities). Constituents may additionally pollute air, water and soil. Everyone gains when historic industrial and household cleaners are cost effectively replaced with "green" products and manufacturing processes that have passed quantitative, objective, and comprehensive assessments.</p> <p>Customization of the Chemical Compliance Systems, Inc. (CCS) "Green" Process Compliance Analytical System (G-PACS) and their "Green" Product Compliance Analytical System (GP-CAS) enables the Chlorine Free Products Association (CFPA) to utilize the "Green" Cleaning Product Process Analytical Compliance System (GCP-PACS) in conjunction with the third party accountability services of our Sustainable Manufacturing Initiative (SMI) on-site audits. Those facilities that complete the SMI with GCP-PACS are then offered access to the on-line, automated "Green" Cleaning Product Compliance Analytical System (GCP-CAS) to provide a complete, comprehensive, cleaning product assessment within 5-10 seconds. Both systems utilize over 40 ecological, health and safety criteria for each chemical constituent. The process, or product, is quantitatively rated on a scale of 0 (worst green) to 100 (best green) for easy manufacturing, or acquisition, assessment against pass/fail criteria, or comparison of competitor products. Compromising product hazards and offending constituents are also quantitatively identified. Both GCP-PACS and GCP-CAS include alternative constituent databases in their process/product Design modes that greatly streamline selection of less hazardous constituents to replace more harmful ingredients. This latter feature greatly facilitates "green" cleaning product and process research and development by rapidly calculating product, or process, "green" ratings as alternative constituents are theoretically inserted for compromising ingredients. Cleaning product or process constituent impacts on over 100 state, federal, international and other third party regulations are simultaneously assessed. GCP-CAS and GCP-PACS represent the first standardized, Web-based analytical compliance capabilities for quantitatively certifying the "greenness" of industrial cleaning products and processes by an independent third party. CFPA recommends that California consider these CCS capabilities as options for achieving the objectives of the California Green Chemistry Initiative.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-3	<p>Green Chemistry & Low Income Community</p> <p>Cal-EPA's Green Chemistry Initiative presents a welcome and needed opportunity to explore claims made by individuals and legislators proposing chemical bans in a forum where policy decisions should be driven by science instead of politics and anti-chemical hype.</p> <p>Earlier this year our organization and others who serve the minority and low income communities opposed AB 706 (Leno). We opposed this legislation because it proposed sweeping bans on the most cost-effective options currently available for flame-retarding upholstered furniture and bedding products. It was felt that if there is a ban, the remaining options would greatly increase the cost of new products, driving low income consumers to cheaper, untreated imports or used products and placing them at greater risk of fire deaths and fire-related injuries.</p> <p>A state chemical policy that is not enforceable is meaningless in terms of protecting California's low income and minority communities. In the case of flame retardants, the Bureau of Home Furnishings already routinely cites importers for violations of the existing state fire retardant standards. To the extent new standards are deemed necessary, they must not result in an increase in cheaper imported products to compensate for higher production costs. Any proposal that would increase existing enforcement challenges will increase the likelihood that dangerous products will make their way into the homes of low income consumers.</p> <p>Any type of Green Chemistry Initiative should include a science-based process and criteria for evaluating chemicals currently in the marketplace on a level playing field with the alternatives advocated by chemical ban proponents to inform the need for, and extent of, risk management actions. By contrast, the trial and error decision making process inherent in current legislative proposals could jeopardize public health and safety. For example, the flame retardant option most favored by anti-chemical advocates is fire resistant barrier (cover) material, which allegedly eliminates the need to treat foam cushions and fills. However, any breach in the barrier from shipping, moving, or normal wear and tear would expose untreated foam, which burns like gasoline. Low income consumers, who are more likely to own second hand furniture, would be at greater risk than those able to afford new products.</p> <p>We feel that when evaluating alternatives to existing flame retardant chemicals, Cal-EPA must also address affordability issues. Low income and minority communities already bear a disproportionate share of fire-related deaths and injuries, in part because they lack the financial resources to invest in fire safety. Thus, any new chemical policies that flow from this Initiative must not have the effect of placing fire safe products further out of reach of these individuals.</p>
F-GC-4	<p>AB 706 & Green Chemistry</p> <p>During the 2007 legislative session, a number of minority organizations opposed AB 706 (Leno) because it proposed sweeping bans on the most cost-effective options currently available for flame-retarding upholstered furniture and bedding products. The remaining options would significantly increase the cost of new products, driving low income consumers to cheaper, untreated imports or used products and placing them at greater risk of fire deaths and fire-related injuries.</p> <p>Cal-EPA's Green Chemistry Initiative presents a welcome opportunity to explore claims made by those proposing chemical bans in an atmosphere where policy decisions can be driven by science instead of politics and anti-chemical hysteria.</p> <p>The Initiative should include a science-based process and criteria for evaluating chemicals currently in the marketplace on a level playing field with the alternatives advocated by chemical ban proponents to inform the need for, and extent of, risk management actions. By contrast, the trial and error decision making process inherent in current legislative proposals could jeopardize public health and safety. For example, the flame retardant option most favored by anti-chemical advocates is fire resistant barrier (cover) material, which allegedly eliminates the need to treat foam cushions and fills. However, any breach in the barrier from shipping, moving, or normal wear and tear would expose untreated foam, which burns like gasoline. Low income consumers, who are more likely to own second hand furniture, would be at greater risk than those able to afford new products.</p> <p>A well intentioned state chemical policy that is not enforceable is meaningless in terms of protecting low income and minority communities. In the case of flame retardants, the Bureau of Home Furnishings already routinely cites importers for violations of the existing state fire retardant standards. To the</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
	<p>extent new standards are deemed necessary, they must not result in an increase in cheaper imported products to compensate for higher production costs. Any proposals that exacerbate existing enforcement challenges will increase the likelihood that dangerous products will make their way into the homes of low income consumers.</p> <p>When evaluating alternatives to existing flame retardant chemicals, Cal-EPA must also address affordability issues. Low income and minority communities already bear a disproportionate share of fire-related deaths and injuries, in part because they lack the financial resources to invest in fire safety. Thus, any new chemical policies that flow from this Initiative must not have the effect of placing fire safe products further out of reach of these individuals.</p>
F-GC-5	<p>Green Chemistry in Office Furniture Products</p> <p>BIFMA International is an organization dedicated to all aspects of safety as it relates to the products that our members manufacture. We support the principle of using less toxic materials in all manufactured products. We also strongly support the concept of global sustainability.</p> <p>In general, most companies in our industry are assemblers of components and therefore users of chemicals within supplied products, not developers of chemicals themselves. Manufacturers typically rely on suppliers to provide information on the contents of the materials they supply to users, in accordance with applicable laws. BIFMA supports public/private collaborative efforts to identify best available options for component materials.</p> <p>In 2004, BIFMA teamed with the Design for the Environment (DfE) Branch of the U.S. Environmental Protection Agency in working with the chemical manufacturers to phase out the use of pentabrominated diphenyl ether as a fire retardant additive in polyurethane foam and replace it with substitute chemicals. Today, the substitute chemicals that were considered to be better alternatives are now being questioned by organizations concerned about their potential adverse long-term environmental effects.</p> <p>At this point in time, furniture industry suppliers indicate that they are not able to eliminate all of the chemicals or compounds thought to pose risks to the environment because there are not agreed upon alternatives. This situation leaves the furniture industry, along with other industries that use chemicals in need of research and guidance in choosing the most appropriate materials</p> <p>BIFMA is actively developing an ANSI Sustainability Assessment Standard for business and institutional furniture, which promises to further improve the environmental performance of office furniture products and is actively working with groups or individuals who are experts in these areas. We have recently become a stakeholder in the State of California's Green Chemistry Initiative and hope to work collaboratively with other organizations in support of education and increased knowledge, both in the area of reducing environmental risk from manufactured products and improving consumer safety. We urge our legislators and regulators to work with us to solve these challenging issues.</p>
F-GC-6	<p>California Bed Clothing Flammability Standard and Green Chemistry</p> <p>One immediate challenge for the green chemistry initiative is Technical Bulletin 604 (TB 604) to regulate the flammability of filled bed clothing including comforters, mattress pads, and pillows. This regulation, being implemented by the California Bureau of Home Furnishings and Thermal Insulation, is likely to lead to the introduction of large amounts of fire retardant chemicals and materials into California's homes and environment. Health and environmental questions such as those listed below should be answered for all stages of the lifecycle of these products: manufacture, use in consumers' homes, and end of life disposal.</p> <p>Although no specific materials are required to meet TB604, it is expected to be met by fiber mixtures containing inherently fire resistant materials and/or added fire retardant chemicals. Some of these fibers, (modacrylic, polyvinylidene chloride, and polyvinyl chloride) consist of polymers that are composed of monomers that are known to be mutagens/carcinogens and/or can cause neurological, developmental or reproductive impacts in animals.[1],[2], [3].</p> <p>In addition TB604 would also impose flammability requirements on foam used in bedding materials, such as mattress pads and pillows. The TB604 foam test is rigorous and, if met by adding FR chemicals to foam, would require significant amounts - much more than currently used to meet the furniture foam requirements included in TB117. A U.S. Environmental Protection Agency study of fire retardants shows areas of significant toxicological and</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>environmental concerns as well as large data gaps for safety information for all of these chemicals. [4]</p> <p>The fire retardant chemicals currently used in foam in California include tris (1, 3-dichloro-2-propyl) phosphate (TDCP), which is a known mutagen and carcinogen. A CPSC analysis predicted up to 300 excess cases of cancer per million when humans are exposed to TDCP from furniture. Another primary fire retardant used in foam is a proprietary mixture called Firemaster 550 containing brominated fire retardants for which little toxicological information is available and a phosphahate which is known to be highly ecotoxic. .</p> <p>Before TB604 is implemented, the following questions and considerations should be addressed:</p> <ol style="list-style-type: none"> 1) What are the environmental impacts of the manufacture, use and disposal of products which are polymerized from toxic monomers or contain toxic or potentially toxic fire retardant chemicals? 2) What are the health impacts of using these fibers and materials in bedding? What is the level of human exposure to the toxic or potentially toxic fire retardant chemicals added to foam and fabrics? Are there residual monomers present in the inherently flame resistant fibers? Exposures for fetuses, young children and pregnant women (the most vulnerable populations to endocrine disruption and potential adverse health outcomes) as well as the number of hours people spend in bed in intimate contact with bed clothing should be considered. 3) Will the inherently flame resistant fibers break down to the toxic monomers in landfills? In that case, will the legislature need to add these bedding products to the list of products banned from the landfill under the Universal Waste Ban, which went into effect in February 2006? If so, will government managed and ratepayer financed local government programs be responsible for their safe disposal or will manufacturers be required to take these products back at the end of their useful life? 4) Do the flame retardant chemicals that would be used to meet the standard persist, accumulate and/or be potentially toxic in humans. Other fire retardant chemicals are rapidly accumulating in humans, wildlife, and the environment. U.S. women have some of the highest levels of fire retardants in their breast milk in the world. Many studies completed underway postulate that a relationship exists between previously used fire retardant chemicals such as PBDEs and birth defects, hyperactivity, reduced fertility and sperm counts and other neurological and reproductive conditions. Will similar chemicals be used to meet your standard? 5) Have studies been conducted on the fate and transport of fire retardant chemicals and materials as following their use in furniture and other consumer goods? Fire retardants such as PBDEs and PCBs have been found in remote areas including the Arctic Circle, with the highest levels found in killer whales. The lifecycle of products containing fire retardant chemicals must be considered including occupational exposure during manufacture, chemical exposure during use, and end of life disposal when products are combusted, land-filled, composted, littered, or recycled. 6) When polyvinylidene chloride, polyvinyl chloride, or materials treated with brominated or chlorinated fire retardant chemicals burn, highly toxic dioxins and furans are believed to be produced. If there will be incineration of these bedding materials, an analysis of the health and environmental impacts of this disposal method should be done. 7) Will plasticizers be used to make polyvinylidene chloride, polyvinyl chloride, and other polymers in the inherently flame resistant materials soft and flexible? Phthalates are sometimes used for this purpose. They are known endocrine disruptors and just have been banned from use in children's items in California. 8) Estimates from New York State suggest that fire-safe cigarettes could lead to 50 to percent reduction in fire deaths The CPSC estimated that the current mattress flammability standard would reduce bedding fire deaths by 69 to 78 percent. With the requirement for fire-safe cigarettes in California beginning January 1, 2007, and a stringent standard for mattresses already in place, has the estimated fire death reduction associated with the proposed bed clothing standard been reevaluated? Has this significantly reduced fire death and injury risk led to a reconsideration of the need for potentially toxic fire retardant chemicals in consumer products? 9) The Green Chemistry Initiative calls for the design of products and processes that reduce or eliminate the use and generation of hazardous substances

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>at all stages of the life of a product, ranging from the manufacture of a product all the way until end-of-life disposal. Implementing a new bedding standard that results in the increased use and generation of hazardous substances appears to contradict the premise of the California Green Chemistry Initiative.</p> <p>[1] IARC (1999). IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Volume 71. Re-evaluation of some organic chemicals, hydrazine and hydrogen peroxide (Part One). IARC, Lyon. pp. 43-108.</p> <p>[2] U.S. EPA (2000). Toxicological Review of Vinyl Chloride (CAS No. 75-01-4). In support of summary information on the Integrated Risk Information System (IRIS). May 2000. EPA/635R-00/004. U.S. Environmental Protection Agency, Washington, D.C. Available at: http://www.epa.gov/iris/toxreviews/1001-tr.pdf</p> <p>[3] U.S. EPA (2002). Toxicological Review of 1,1-Dichloroethylene (CAS No. 75-35-4). In support of summary information on the Integrated Risk Information System (IRIS). June 2002. U.S. Environmental Protection Agency, Washington, D.C. Available at: http://www.epa.gov/IRIS/toxreviews/0039-tr.pdf</p> <p>[4] U.S. EPA (2005). Furniture Flame Retardancy Partnership: Environmental Profiles of Chemical Flame-Retardant Alternatives for Low-Density Polyurethane Foam. September, 2005. EPA 742-R-05-002A, U.S. Environmental Protection Agency, Washington, D.C. Available at: http://www.epa.gov/dfe/pubs/flameret/ffr-alt.htm</p>
F-GC-7	<p>Center for Biological Diversity Comments</p> <p>The Center for Biological Diversity (“the Center”) appreciates the efforts being made by the state of California to address the issue of toxic chemicals. Toxic chemicals have become a pervasive part of our lives and action is necessary to protect public health and the environment from further degradation. The Center encourages California to lead the way as it has on other important environmental issues such as global warming—waiting for nationwide consensus will only result in further damage to the health of Californians and to California’s environment.</p> <p>The Center for Biological Diversity advocates a precautionary approach to toxic chemicals. This means the burden of proof should be on the chemical producing companies to fully disclose the chemicals in their products and to adequately demonstrate that the chemicals and products are safe. A precautionary approach also means that California should not fail to act in the face of uncertainty—there is no reason for humans and the environment to suffer simply because of the lack of conclusive proof about the effects of various chemicals that have been found to be potentially harmful. In other words, if conclusive proof is required, such a burden should lay with the chemical producers to conclusively demonstrate that their chemicals and products are safe. Chemical companies should also be required to fund independent research of the impacts of their products, not just research conducted by their own scientists. Moreover, the research should address the effects of multiple chemicals—only testing chemicals in isolation will fail to address the real world impacts.</p> <p>Furthermore, “safe” should not focus solely on human health. It is imperative that the precautionary approach be directed at the health of animals and plants as well. For instance, frogs, other amphibians, and fish are highly sensitive to chemicals in their environment. Many scientific studies have shown how chemicals are harming fish and amphibians, especially by disrupting their immune, endocrine, or reproductive systems. See, e.g., Rosen, Michael R. et al., Investigations of the Effects of Synthetic Chemicals on the Endocrine System of Common Carp in Lake Mead, Nevada and Arizona, U.S. Geological Survey, Fact Sheet 2006-3131, Version 1.1, October 2007, Prepared in cooperation with the U.S. Fish and Wildlife Service and National Park Service (found at http://pubs.usgs.gov/fs/2006/3131/); Hayes, Tyrone B., et al, Hermaphroditic, demasculinized frogs after exposure to the herbicide atrazine at low ecologically relevant doses, Proc. Natl. Acad. Sci. April a6, 2002, Vol. 99, Issue 8, 5476-5480 (found at www.pnas.org/cgi/reprint/99/8/5476.pdf); Endocrine Disrupting Chemicals: Summary of Research Activities within BRD (found at http://www.cerc.usgs.gov/Other_Webs/endocrine/summary.htm); Summary of Endocrine Disruption Research in Contaminant Biology Program (found at</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>http://www.ecrc.usgs.gov/endocrine/summary.htm); Poisoning our imperiled wildlife: A Center for Biological Diversity Report, February 2006 (found at http://www.biologicaldiversity.org/swcbd/programs/science/pesticides/BayAreaPesticidesReport.pdf. In fact, heavy metals and PCBs are persistent in high quantities in fish, marine mammals, and seabirds, which can cause genetic damage as well as harm to immune systems. See, e.g., Toxicology of Marine Mammals, Edited by Joseph G. Vos et al.; David R. Thompson¹ & Keith C. Hamer; Stress in seabirds: causes, consequences and diagnostic value, Journal of Aquatic Ecosystem Stress and Recovery 7: 91–110, 2000. Again, in order to protect California's biodiversity, the focus should be on only allowing the use of products that have been demonstrated to be harmless. Where uncertainty exists, caution should be exercised in favor of protecting wildlife and the environment—uncertainty should not be allowed to be used as an excuse for continued use of potentially unsafe chemicals and products. While impacts to all wildlife should be addressed, it makes sense to prioritize by focusing research on the impacts of chemicals to endangered, threatened, or imperiled species. By addressing the most vulnerable, we will likely be protecting many other species as well. It also makes sense to focus the most energy on amphibians and upper trophic level predators. Amphibians, due to their body type, are often the first animals to be impacted by toxics and can therefore likely provide us with early and important information about the harmful impacts of chemicals; upper trophic level predators (like polar bears) bioaccumulate toxins and therefore often exhibit high toxin concentrations in their systems, making them important sentinels of the ecological impacts of toxins. Research efforts should also include the monitoring of various species, especially amphibians and upper trophic level predators, so as to better understand what chemicals are already present in the environment and what their impacts are.</p> <p>In short, there is no sound reason to place the health of humans, or of other species, at grave risk, simply because we failed to adequately and carefully ensure that various chemicals were safe and would not accumulate in the environment. In addition to the adoption of regulations that better prevent harmful chemicals from being used in the first place, the Center advocates for the phasing out and ban of all chemicals found to be harmful to people or wildlife. A good example is the legislation recently passed by the state of California that outlaws the use of lead bullets in California condor habitat. This was necessary because the science showed that condors were being significantly harmed by lead. Similar legislation should be passed when confronted with situations where chemicals are harming people, wildlife, or the environment. Finally, incentives should be instituted that encourage the production and use of products that do not contain toxic chemicals as well as more aggressive education campaigns about the alternatives to harmful chemicals and their products.</p>
F-GC-8	<p>Comments - California Green Chemistry Initiative</p> <p>Thank you for soliciting input from California residents concerning the Green Chemistry Initiative. I am currently writing a book-length narrative about environmental illness (including one fictional character based on Dr. John Balmes, who was extremely helpful to me when I first became chemically sensitive), and I would love to contribute my insights to your project.</p> <p>The REACH program currently underway in the E. U. would be a wonderful model for California. In addition to this, however, we need to zero in on those toxins to which the general public is being heavily exposed on a daily basis. At the top of this list is secondhand cigarette smoke.</p> <p>Twenty-one years ago, Surgeon General C. Everett Koop concluded that secondhand smoke causes disease. Twenty years later, Surgeon General Richard Carmona called secondhand smoke an alarming public health threat, "a serious health hazard at any level!" One and a half years ago, the State of California's Air Resources Board defined secondhand smoke as "toxic." So what are we waiting for?</p> <p>Who are we afraid of? ...more</p> <p>on behalf of Trudy Fisher</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-9	<p>Education and the Environment Initiative November 16, 2007 Maureen Gorsen Director Department of Toxics Substances Control PO Box 806 Sacramento CA 95812-0806 Dear Ms. Gorsen-</p> <p>On behalf of my environmental organization Heal the Bay, and the public-private partnership of the Education and the Environment Initiative, I express strong support for the Green Chemistry Initiative. Clearly, the current structure by which we regulate chemicals in California is not sustainable. Given that California has serious pollution, ecosystem degradation, and natural resource scarcity concerns, it is imperative that the state develop a more cradle-to-cradle approach. The Department of Toxics Substances Control's (DTSC's) leadership is essential to create such a new policy and regulatory framework. Green Chemistry will better enable California to protect people, and the environment, as well as economically keep pace with changes worldwide, and here at home.</p> <p>Educate about the environment is fundamentally critical to any such new Green Chemistry policy and attendant programs. Education is necessary in order to scientifically inform such a policy, practically and efficiently implement it, and also to disseminate information about it to future generations. Luckily, California is currently poised to lead the nation in environmental literacy: the Education and the Environment Initiative (EEI) is a landmark environmental education law that requires the development and implementation of multi-disciplinary environmental education curricula in all disciplines (science, history/social science, English/language arts, and mathematics) for all K-12 grade students in state public schools. The EEI was co-authored by environmental organization Heal the Bay and signed into law in 2003 by former California Governor Gray Davis. In 2005, Governor Schwarzenegger allocated state funds over two years for environmental education curricula development under the EEI. A national model, the EEI will ultimately allow six million California school children each year to have the information they need to make informed decisions about protecting their health and our precious natural resources.</p> <p>As currently being developed, the EEI will necessarily include information that touches on green chemistry specifically. For example, EEI statutory mandates specifically call for the EEI curricula to address topic areas such as "toxics and hazardous waste," "public health and the environment," "pollution prevention," and "environmental sustainability." Obviously, there is significant overlap between the educational mandate of the EEI and the subject matter and goals of any state Green Chemistry Policy.</p> <p>We therefore encourage DTSC to make sure there is full integration between the EEI curricula development and its implementation, and the Green Chemistry policy and program development (including, but not, limited to K-12, post-secondary, and vocational educational efforts associated with Green Chemistry.) To date, DTSC has been very supportive of the EEI effort, and we gratefully applaud their leadership in this regard. We hope that as the Green Chemistry policy unfolds, that DTSC will continue to closely coordinate with the EEI and share Green Chemistry educational content, potential outreach opportunities, and other resources. Together, we can help children learn about environmental issues and make informed decisions about their individual impact on the environment.</p> <p>Sincerely, Leslie Tamminen Legislative Director/EEI Director Heal the Bay</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-10	<p>The Green Chemistry Matrix As was pointed out at a recent conference I attended, there really is no such thing as "green chemistry" per se. The second law of thermodynamics dictates that some disorder -- aka resource depletion and pollution -- is inevitable in any process. The concept of "greener" chemistry, however, is a very viable one. Many -- if not most -- of the processes that create consumer products could be made greener without sacrificing technical or economic values. Greener chemistry has a few critical characteristics: First -- and really, by definition, a green chemistry alternative it must result in a reduced carbon footprint in comparison to the chemical process it is replacing. Second, it should involve the use of less hazardous and more degradable reagents. Third, it should entail substantive utilization of renewable feedstocks. And, very importantly, it should entail increases in efficiency and optimization of processes. Green chemistry, then, represents an optimization of hazard and depletion minimization with process efficiency maximization. A useful way to develop a Green Chemistry initiative that can identify optimal future directions would be to develop a simple Green Chemistry Matrix system to sort out current and projected chemical practices into the four categories of: Clean Product/Clean Process (upper left corner - most desired), Clean Product/Dirty Process, Dirty Product,/Clean Process, and Dirty Product/Dirty Process (lower right corner, least desired),. With this matrix in place it is then possible to identify the tradeoffs involved and factors entailed in enhancing feasibility of shifting to that upper left corner. The Green Chemistry Matrix provides a framework for identifying the most expedient paths to clean products and services produced through clean processes. Pollution and waste -- the byproducts of non-green chemistry -- have been defined as resources in need of beneficial applications. The Green Chemistry Matrix makes it easier to understand how to go about identifying these applications.</p>
F-GC-11	<p>CalARVC's Comments The California Association of RV Parks and Campgrounds (CalARVC) requests that the Department of Toxic Substance Control prohibit the import, sale, or use of certain RV toilet additives as part of the California Green Chemistry Initiative. Many of these products are detrimental to onsite septic systems and often cause systems to fail and pollute surrounding soil and groundwater. CalARVC, which is comprised mainly of hundreds of small "mom and pop" RV parks and campgrounds from all over the state, has been seeking a solution for this problem to several years. CalARVC believes the best solution is to ban the sale and use of deleterious products that contain formaldehyde or similar biocides. Most of the toilet additive products sold and used in California contain formaldehyde or a derivative of formaldehyde. These products help dissolve toilet paper and bio-solids and are used by RV owners to prevent odors and blockages in their toilet systems. However, the chemicals in these products that help dissolve toilet paper and bio-solids also kill natural biological organisms used in many onsite wastewater systems. Many onsite wastewater treatment systems use natural organisms to breakdown bio-solids and toilet paper. Thus, when RV holding tanks containing certain RV toilet additives are dumped into an onsite wastewater system, which is a common everyday occurrence at RV parks, the chemicals designed to eliminate odors and dissolve toilet waste also kill off the natural organisms causing the onsite septic systems to fail....more</p> <p>on behalf of California Association of RV Parks and Campgrounds</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-12	<p>Johnson & Johnson - Additional Comments On behalf of Johnson & Johnson and its family of companies, I appreciate the opportunity to provide additional comments on the California Green Chemistry Initiative. Johnson & Johnson has identified a number of key policy points regarding green chemistry that we believe are important guidelines that will lead to the overall success of California's Green Chemistry Initiative. Johnson & Johnson recommends specific policy points should be structured around the following policy goals and objectives:</p> <p>on behalf of Johnson & Johnson</p>
F-GC-13	<p>Policy Options The stated purpose of the Green Chemistry Initiative is to stimulate a green chemistry transformation in the design of products and processes. The policy options available to a governmental decision maker are not unlimited. However, there are many things that a governmental policy maker can do and these various options are fairly well understood. Some people may think of them as the policy maker's "tool kit." The options (or "tools") are basically as follows: (1) activities or substances can be prohibited or banned; (2) activities or substances can be legally restricted; (3) activities can be regulated; (4) activities can be taxed; (5) reporting obligations can be imposed on certain activities; (6) permits can be issued to govern the manner in which activities are carried out at a particular location; (7) government studies can be conducted to bring increased knowledge to bear on an issue; and (8) grants can be established to fund research and development and other activities. The rest of this email looks at the options or tools one at a time to see which of them would be most helpful in stimulating a green chemistry transformation in the design of products and processes. Prohibitions: Prohibiting the use of certain substances will not directly stimulate a green chemistry transformation in the design of products and processes. Banning certain substances would presumably lead to a search for substitutes for the banned substances. This could lead to more benign substitutes being developed to replace the banned substances. This is largely what happened when chlorofluorocarbons were phased out by the Montreal Protocol. However, prohibitions can also lead to the marketing of substitutes that are not so benign, such as methyl tert-butyl ether. Restrictions: A restriction prevents the use of certain substances in their most problematic uses. This differs from a prohibition, which prevents the use of certain substances for essentially all uses. Similarly to prohibitions, restrictions will not directly stimulate a green chemistry transformation. Restrictions may be useful in preventing certain substances from being used in ways that are particularly problematic, but restrictions will have at best only an indirect effect on promoting innovation. Regulation: Regulation generally entails placing a series of requirements—sometimes quite detailed—on certain activities. Regulation is generally not perceived as a mechanism that fosters innovation. In general, regulation has the opposite effect—it tends to stifle innovation. Taxation: A tax scheme could theoretically be used to create disincentives to the use of more toxic substances. Higher taxes on more toxic substances and smaller or no taxes on more benign substances would theoretically lead to substitution of the more benign for the more toxic. However, a tax system would be difficult to implement in practice. There are many different ways to measure toxicity and little agreement on which method is best. Taxes would have to be established for thousands of substances, which could create regulatory gridlock. There is also a lack of data on which to make relative toxicity determinations and due to the flow of new information, adjustments would have to be made continually to the various tax rates. Finally, if an incorrect toxicity determination were made, it would result in incorrect incentives being established. Reporting Obligations: Reporting obligations, such as the Toxic Release Inventory, create incentives to minimize the use of hazardous substances, as entities that use chemicals generally do not want to appear near the top of the listings that are published. It is unclear whether reporting obligations spur the substitution of more benign substances. It does not appear that reporting obligations by themselves would lead to green chemistry innovations.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>Permits: While permits can be useful in conforming existing practices to accepted standards of conduct, it is difficult to see how a permitting scheme would lead to innovation in this area. Permits could contain a condition that facility operators review their processes and inputs periodically to determine whether changes could be made that would result in a reduction in the use of hazardous substances. Such conditions are unlikely to be effective, as such conditions are essentially unenforceable and are, in any event, too weak of a mechanism to effect significant process changes.</p> <p>Studies: Government sponsored studies often bring needed fact finding to bear on governmental decisions. The Green Chemistry Initiative is one form of governmental study. Further studies into various aspects of chemical usage may be helpful.</p> <p>Grant Funding: Funding for research and development is a well understood method of spurring innovation. Public and private research has developed many techniques for decreasing the use of chemicals in various applications. To take one example, it was common practice 25 years ago to strip paint off aircraft by using solvents. This process was replaced by plastic media blasting, where small plastic pellets are used to blast the paint off aircraft in a process similar to sand blasting. This process eliminates all chemical waste, except for the paint itself and minor losses of the plastic pellets. It has been suggested that the plastic media could be replaced by high pressure water or ice crystals, thus eliminating all waste streams except for the old paint. It appears that one of the most effective ways to stimulate a green chemistry transformation in the design of products and processes would be to substantially increase funding for research and development in this area. California is home to many universities that have excellent research facilities and that would be ideal for this type of research. A dedicated program could be instituted at one university, or research could be spread out at many campuses. Varied funding sources may be available, including legislative appropriation, bond funding, and donations from interested companies and foundations.</p> <p>Conclusion. Of all the tools available to the policy maker, increased funding for research and development appears to be by far the most likely to stimulate a green chemistry transformation in the design of products and processes. None of the other mechanisms offer much realistic promise of stimulating innovation. The transformation in products and processes has really already begun (e.g., the paint stripping process discussed above). More research and development funding could be instrumental in speeding the transformation.</p>
F-GC-14	<p>Policy Elements proposed by the Silicon Valley Leadership Group Green Chemistry in California – Initial Policy Elements Proposed by the Silicon Valley Leadership Group (These comments have been posted to all four discussion forums in the same form, due to overlap in topics.) The Silicon Valley Leadership Group advocates a comprehensive, integrated approach to expanding Green Chemistry in California. By highlighting leaders in the corporate environmental practices and encouraging those who are further behind, we can all move ahead. We envision Green Chemistry as an interactive, evolving partnership with industry, government and consumers working together to protect human health and promote a cleaner, safer environment. Leadership Group members involved in crafting these initial suggestions include those from the electronics, biotechnology, pharmaceutical, chemical manufacturing, and supporting sectors. For more information about the Leadership Group please visit www.svlg.net. The Leadership Group proposes the following policy elements to further Green Chemistry in California:</p> <ol style="list-style-type: none"> 1. Strengthen the recognition and pursuit of Green Chemistry processes and products by establishing clear criteria and voluntary certification based on comprehensive lifecycle considerations. Equally important, consumers need to be educated about responsible choices and practices. 2. Explore models other than, or building upon, the current Materials Safety Data Sheet (MSDS) system to provide needed chemical hazard data throughout the supply chain. 3. Establish a Green Chemistry Coordination Council to collect and promote the sharing of information, highlight businesses with green practices, provide

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>assistance to businesses lacking resources, and educate consumers.</p> <p>4. Prioritize chemicals for screening, testing and appropriate restrictions. We suggest building upon the model of Canada's analysis and prioritization as well as the Proposition 65 review process conducted by OEHHA. Chemicals of high concern should be allowed for targeted, low-exposure uses as determined in an open process by DTSC.</p> <p>5. Greater investment in pollution prevention in the short term as well as extension of the current CA Pollution Prevention model to downstream chemical users as an element of the long term Green Chemistry strategy.</p> <p>6. Continue the Conversation with California to sustain progress in Green Chemistry. The dialogue between DTSC and stakeholders has been very helpful and will result in more well-developed, effective policy.</p> <p>IN MORE DETAIL:</p> <p>1) Issue: Our market economy and the innovations that it engenders, environmental and otherwise, are driven by the relationship between industry and consumers. In order for industry to offer products that are environmentally-sound, and for consumers to recognize them, clear and stakeholder-driven criteria are necessary.</p> <p>Proposal: The Leadership Group proposes we strengthen the recognition and pursuit of Green Chemistry processes and products by establishing clear criteria and voluntary certification based on comprehensive lifecycle considerations. Equally important, consumers need to be educated about responsible choices and practices.</p> <p>While the focus of the Initiative has been on chemical safety, green chemistry in the broader sense should incorporate an accounting of embedded energy, CO2 impact, water usage, packaging, recyclability and so forth. Industry on the whole is already moving toward a greater consideration of these factors in our practices. The difficulty of quantifying and ascribing relative importance to these factors points to the need for commonly-held practices or industry standards.</p> <p>A voluntary certification program for green chemistry processes and products will clarify goals for industry members while empowering consumers with the information they need to make informed choices. As green chemistry practices evolve, according to the green chemistry principles we are so well aware of, so should the criteria - we should build flexibility into the system. It is important to note that a voluntary system is more pragmatic than standards at this point, given the innovative and often resource intensive approaches that will be required, the longer timeline necessary for industry transformation, and the need for consumers to have choices. As with organic food, not every consumer wants the environmentally-sensitive approach, if it costs more. The International Standards Organization (ISO) 14001 process certification and ACC's Responsible Care Management Practices are good examples to build upon.</p> <p>It is also important to note that potential green chemistry certification should be a recognition of process in addition to the product. As many experts in the DTSC Symposia have remarked, we are not only trying to improve products, but the entire system that goes into making that product. And we should realize that perfection will not be immediate, but evolve over time. In order to motivate voluntary certification some type of incentive, especially market mechanism such as rebate, tax incentive, or fee refund, should be explored.</p> <p>We understand very well that the consumer wants environmental accountability. As consumers gain in accountability, though, so should they gain in responsibility. This is in no way a proposal to allow industry to abdicate its responsibility for the safer use of chemicals, but rather to acknowledge that in a market-based society, corporate and consumer responsibility must closely intertwine to be successful. Beyond making informed purchases, we can best protect the environment when consumers understand Green Chemistry applies to them as well. How they collectively handle chemical products has an enormous effect (for example, nail polish remover can be easily poured down a household sink which would not be allowed in the workplace). The Green Chemistry Coordination Council described in the third point below could assist in consumer education.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>2) Issue: The MSDS provides insufficient data on chemical hazards to those downstream in the supply chain. Proposal: The Leadership Group proposes the DTSC explore models other than, or building upon, the current Materials Safety Data Sheet (MSDS) system to provide needed chemical hazard data throughout the supply chain.</p> <p>Our members often find the data included on the Material Safety Data Sheet (MSDS) to be insufficient for determining chemical hazards. Many times important information is addressed in a superficial, boiler-plate fashion or missing altogether. The same raw material from different suppliers may have divergent information. This is in part due to some government regulations requiring that an MSDS be obtained directly from the manufacturer. While we recognize that confidential business information needs to be protected, best possible data on hazard and ecological effects should be made readily available to the supply chain and other stakeholders. In order to meet customer information requirements on chemicals in products, some electronics manufacturers currently must request additional information from upstream suppliers. Instead of doing this on a case by case basis, and in some cases taking the costly approach of reverse-engineering products to determine content, it would be more cost-effective to make raw materials hazard information available further upstream.</p> <p>One approach that could facilitate the sharing of information could be to use the existing MSDS system as a vehicle. More uniform information availability, through approaches such as the ANSI standard for a 16-section MSDS or the IPC 1752 could be an improvement. However, since the MSDS was originally intended to provide more immediate emergency response and use information, it might be best to explore other options such as an MSDS addendum, focused on hazard data. As both REACH and industry efforts such as the Global Product Stewardship initiative make available this data over a 4-10 year timeframe, it is important to recognize that generating this hazard data will take time.</p> <p>A voluntary certification process, with recognition for particularly thorough MSDS's, could also improve the quality of information while allowing chemicals manufacturers to differentiate their products. The Global Harmonization System for the Classification and Labeling of Chemicals (GHS) should be considered, as well. Any model chosen should include the appropriate ecological as well as toxicological information. We also recommend that early stage R&D chemicals be exempted due to their limited use and limited exposures.</p> <p>Worker exposure issues involving recognized hazards (mostly in small/medium enterprises) during the Conversation with California suggests that incorporating MSDS information into real-life practices may be an issue, aside from content. Technical Assistance for those less familiar with critical MSDS information is included as part of the Green Chemistry Coordination Council described below.</p> <p>3) Issue: Some companies and industries have already made much progress in achieving the aims of Green Chemistry while others lag behind. Green Chemistry involves myriad innovations and the collection and processing of much information. We do not have an adequate way of sharing Green Chemistry practices nor have we made the investment to encourage and reward green efforts.</p> <p>Proposal: The Leadership Group proposes the establishment of a Green Chemistry Coordination Council to collect and promote the sharing of information, highlight businesses with green practices, provide assistance to businesses lacking resources, and educate consumers.</p> <p>The information presented by the speakers, panelists, and stakeholders during the past year of effort on this Initiative has been incredibly thorough, enlightening, and inspiring for all stakeholders. We suggest the DTSC catalog and make easily available information regarding best practice screening processes, green chemical design, collaborative efforts such as the ACS Green Chemistry Institute, and international efforts such as the Global Harmonization System. All stakeholders still have a lot to learn in this dynamic area, and everyone stands to gain from continued information sharing. DTSC's leadership in this area should be continued by establishing it as a central clearinghouse of information for the state and beyond.</p> <p>Many medium and small companies are lacking in appropriate knowledge and resources, and will need assistance in taking advantage of Green Chemistry practices. Providing incentives for the sharing of data and best practices will help all companies. We further suggest building upon and making readily available the information provided by existing efforts: ACS Green Chemistry Institute, Cleangredients, U.S. EPA's Design for Environment</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
4)	<p>Program, Performance Track, the chemical industry's HPV testing program, eChemPortal, EPEAT, and DTSC Technical Resource Center.</p> <p>Issue: California has limited resources to evaluate chemicals for restriction. Chemical safety is a measure of exposure as well as toxicity. While we need to carefully assess and restrict the use of chemicals of concern, complete bans fail to allow for appropriate and beneficial uses.</p> <p>Proposal: The Leadership Group proposes the DTSC prioritize chemicals for screening, testing and appropriate restrictions. We suggest building upon the model of Canada's analysis and prioritization as well as the Proposition 65 review process conducted by OEHHA. Chemicals of high concern should be allowed for targeted, low-exposure uses as determined in an open process by DTSC.</p> <p>The DTSC, together with other relevant State agencies, needs to establish clear and consistent science-based protocols for screening and testing. These should include determination of endpoints of concern and modes of action, where scientific and methodological questions are sufficiently advanced to enable consistently sound science-based judgments of potential risk. The use of a transparent and rigorous process to evaluate risk factors as indicated by toxicological, epidemiological, and exposure data will allow us to compare the relative importance and safety of chemicals as well as determine whether any restrictions or substitutions are appropriate. A scientific panel of experts with a range of theoretical and applied chemicals experience can best establish and oversee a process acceptable to all stakeholders. The Proposition 65 review process may offer a starting point for development of a thorough, scientific process to meet these broader needs.</p> <p>Government entities around the world have been or are in the process of revamping their chemicals use policies. Although the DTSC will need to analyze the individual needs of our state through such means as chemical mapping, we should coordinate with the chemicals policies of other countries to minimize confusion, cost and competitive impacts. Starting with the thorough screening done by Canada's Environmental Policy Act (CEPA) would allow us to build upon their scientific knowledge base and mitigate the burden of data gathering.</p> <p>Any proposed restrictions or mandates should be targeted and include careful evaluation of alternatives. This targeted approach will allow us to concentrate our resources where most needed. Furthermore, any mandates should be harmonized with systems in other countries as much as possible. While we wish it were not necessary to use chemicals determined by such scientific protocols to be of high concern, many times they are needed to promote human health or advance ground-breaking research. This is the uncomfortable irony with which we will have to live until we find better alternatives. In the meantime, targeted use of these chemicals under highly controlled and low-exposure scenarios should be allowed by DTSC, after an open, scientifically based stakeholder process. In the absence of safer alternatives, which should be technically feasible, improve health/safety/environmental profile, be of comparable or superior performance, cost-effective, and be capable of persistence, banning should be avoided. In that case, resources should be devoted to R&D or incentives should be provided to develop cost-effective alternatives.</p> <p>Our goal should be a marketplace where informed decision making at both the manufacturing and consumer levels is consistently delivering changes/substitutions that advance our collective interests along the dimensions outlined above.</p> <p>We recommend that novel R&D chemicals, used in relatively tiny amounts in highly controlled settings, be excluded from any consideration of a restriction or mandate. There are rarely, if ever, exposures outside of the laboratory. Government oversight of these chemicals would not be cost-effective and would be counterproductive to the aims of Green Chemistry. Flexibility in this type of research chemical use promotes the innovation of safer chemicals and processes. Both CEPA and REACH exempt these chemical uses. Exemptions should also be allowed for select pilot demonstrations and testing.</p> <p>Issue: It will take a significant amount of time for industry and consumers to move to Greener Chemistry and we need to address pollution concerns in the meantime. Existing efforts at pollution prevention in the state utilize a collaborative model that has proven effective, but has been limited by its modest resource commitment and its narrow manufacturing focus.</p> <p>Proposal: The Leadership Group proposes greater investment in pollution prevention in the short term as well as extension of the current CA Pollution</p>
5)	<p>Issue: It will take a significant amount of time for industry and consumers to move to Greener Chemistry and we need to address pollution concerns in the meantime. Existing efforts at pollution prevention in the state utilize a collaborative model that has proven effective, but has been limited by its modest resource commitment and its narrow manufacturing focus.</p> <p>Proposal: The Leadership Group proposes greater investment in pollution prevention in the short term as well as extension of the current CA Pollution</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>Prevention model to downstream chemical users as an element of the long term Green Chemistry strategy. Pollution prevention programs and policies such as SB 14 have been promoted for quite some time, yet they never receive anywhere near adequate funding and attention. We need to increase our investment in pollution prevention assistance, especially for medium and small businesses that either lack the resources or motivation to tackle the problem on their own. Since pollution prevention has led to demonstrated improvements and optimization of chemical processes, it is a critical, complementary approach to Green Chemistry's goals of better chemical design.</p> <p>The model of collaboration between companies, the DTSC and third party experts (in the case of the SB 14 program, from the University of California), may also offer a model applicable to a broader Green Chemistry strategy. The impressive accomplishments of the Institute for Research and Technical Assistance in enabling development of substitutes for problem solvents in various applications suggest that such targeted 3rd party collaboration may pay dividends in products/product use as well as in manufacturing. This suggests the possibility of 1) taking chemicals of top priority concern, 2) identifying the specific applications or industry uses posing the greatest risk from those chemicals, and 3) applying a collaborative process of agency, industry and third-party experts to identify or develop viable alternatives that can maintain efficacy, but reduce risk in those targeted applications.</p> <p>6) Issue: The stakeholder process for developing Green Chemistry has provided much more comprehensive progress than could have been achieved otherwise.</p> <p>Proposal: The Leadership Group proposes we continue the Conversation with California to sustain Green Chemistry progress. The dialogue between DTSC and stakeholders has been very helpful and will result in more well-developed, effective policy.</p> <p>We commend the DTSC for encouraging creativity in finding safer alternatives and providing opportunities for open-ended discussion. There remains, though, a very real need for extensive further discussion by the stakeholders in this Green Chemistry Initiative. We hope that the inclusive nature of this process is not at an end. There are so many pieces to Green Chemistry and as the focus narrows to various subtopics, meaningful stakeholder participation will be essential. We have all built personal relationships and broadened our understanding of the various points of view. It would be a shame to toss this hard-won experience aside.</p> <p>Submitted: November 16, 2007</p>
F-GC-15	<p>An integrated green chemistry program</p> <p>I am an assistant professor of Science, Technology and Environment at the Department of Environmental Science, Policy and Management at UC Berkeley. Green chemistry constitutes one of my prime research interests. I welcome this opportunity to contribute my research insights to the ongoing dialogue.</p> <p>In order to facilitate greater adoption of green chemistry in industry, I urge the State of California to develop an integrated program that features the following actions.</p> <p>Introduce a regulatory requirement that all existing chemicals undergo a tiered process of scrutiny for their environmental, social and health/toxicity impacts. No chemical used or sold in high volumes, or potentially highly hazardous, should be allowed to remain on the market unless it has been, or is being, tested according to standards that the State of California has formulated after considering world best practices. These standards need to be harmonized with the leading practices of the world to avoid multiplying requirements.</p> <p>In parallel, introduce a regulatory requirement that this information should be passed in a standard form along the supply chain. Currently, many downstream manufacturers lack the ability to understand what they are receiving.</p> <p>Require manufacturers to label consumer products with all the chemicals and materials (including nanotechnology) that these contain. Consumers currently lack the information required to discriminate between products based on their toxicity impacts, so industry has few incentives to develop new green chemistry products. Proposition 65 is aging and needs extensive updating along with a re-focusing on green chemistry solutions rather than simply</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>toxicity warnings.</p> <p>In parallel, develop interactive consumer tools and technologies that assist consumers to interpret and use labeling data in their shopping. The Toxics Release Inventory succeeded because information tools made its data highly accessible.</p> <p>Require industry to conduct green chemistry assessments for chemical products sold or used within California. These assessments would consider whether there are green chemistry design options available and use options analysis to justify how products are designed. These assessments can be modeled on the Massachusetts TUR Act but be updated greatly to reflect the combination of both products and processes. Companies currently do not generate enough decision-making information within their businesses. Registration of chemicals for marketing could be linked to the use of green chemistry design tools: if these tools have been used, then approval of the chemicals could be expedited.</p> <p>Expand greatly the investment of resources into green chemistry education and research at California State-supported universities, including the UC system. Chemists and chemical engineers are not trained adequately to address toxicology, ecology and societal concerns. Universities in California can begin developing technologies and new products, helping generate revenues through licensing and commercialization.</p> <p>Introduce a modest toxicity tax on all intermediates and chemical products used or sold within the State of California. Modeled on European examples, as well as the tax on pesticides and chemicals that helped support the Superfund for a decade, this tax would create a new incentive for industry to develop products with less toxicity. The tax would also reduce the subsidy that society is paying the chemical industry through externalizing health impacts, by supporting better health tracking and university R&D.</p> <p>The State of California itself can work with leading procurement entities, such as Kaiser Permanente, to create a systemic process for favoring green chemistry products according to a California Certified Green Chemical Standard that stakeholders in the state jointly develop.</p>
F-GC-16	<p>An Opportunity for Enhance Educational Partnerships</p> <p>Albemarle Corporation is pleased to submit additional comments on the California Department of Toxic Substances Control program for Green Chemistry. We would encourage initiatives to drive programs designed to help develop educational opportunities focused in math and science, cultural initiatives, health and social programs, and volunteerism.</p> <p>The importance of skills obtained from a solid foundation in science, including critical thinking and analyzing data is recognized. We are excited about the possibilities Green Chemistry can bring to the young scientists of today and believe that through fundamental and applied research initiatives, the Green Chemistry program in California can unleash the creativity and innovation found in University and school chemistry departments around the country. Students can become involved in discovering the next generation of chemicals, materials, products and processes, which can lead to enhancement of human health and the environment. With focused research, scientists will be able to discover better ways of maximizing the benefit while minimizing the environmental footprint that chemicals may have during their life cycle.</p> <p>Collaboration with industry should be a key part of the Green Chemistry program. Direct engagement between the chemical industry, academia, government entities and environmental organizations can bring about chemical innovation that is sensitive to public needs and concerns. Increased funding and better research into new methods for chemical process development, risk assessment and life-cycle management are essential elements to such a program. One area that warrants further attention is in end-of-life options for electronic waste, such as recycling, incineration, smelting and re-use. These options are currently in place around the world today, but are yet to prove economically sustainable in most cases to allow for broad application. Stakeholder partnerships involving industry are one way that Green Chemistry could be used to progress and drive efficiencies in this area.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-17	<p>WSPA's Comments on the California Green Chemistry Initiative The Western States Petroleum Association (WSPA) is pleased to offer the following comments on policy options being considered in the context of Cal-EPA's Green Chemistry Initiative. Many of the comments submitted to DTSC to date and debated in public forums refer to the need for California to supplement the requirements of the Federal Toxic Substances Control Act (TSCA). Prior to immediately moving in this direction, WSPA believes that DTSC must evaluate what regulations and information are currently available and whether these tools are being appropriately implemented and applied prior to developing new programs. Indeed, we expect this analysis is already underway, pursuant to the mandate to conduct a "baseline assessment" of existing programs and information described in the April 20 memorandum from Cal-EPA Secretary Linda Adams announcing the Green Chemistry Initiative. We further expect that this analysis will be presented to Initiative stakeholders for review and comment along with the policy options that flow from it, to ensure that all relevant information has been considered, including information obtained from national and international programs. We are optimistic that this approach will lead to meaningful improvements in existing state programs.</p> <p>on behalf of Western States Petroleum Association</p>
F-GC-18	<p>Concerned About Safety of Products I am a resident of Ojai, California, and am concerned about the safety of many of the products we use from toxic chemicals in them - mostly food, but also pharmaceuticals, cleaners, etc. I have learned about the Green Chemistry Initiative which provides an opportunity to protect California by acting to restrict or eliminate especially dangerous substances and by mandating safer alternatives. This is a wonderful idea and I heartily endorse it. However, I really encourage you to ensure that in addition to incentive programs, the Initiative implements protective regulations, including restrictions and bans of chemicals for which the weight of evidence demonstrates a severe hazard to human health and/or the environment. Many thanks for considering this suggestion.</p> <p>on behalf of Walter M. McClelland</p>
F-GC-19	<p>California Green Chemistry Initiative - Comments I am in support of the Green Chemistry Initiative to restrict or eliminate dangerous substances in California. We are being exposed to far too many chemicals in our daily environment and many of us are getting sick. It is especially necessary to get them out of commercial cleaning products that are used everywhere, from stores to doctor's offices and even hospitals! We need some strict regulation on use of harmful chemicals that in many cases can simply be replaced by less or non toxic ones. This is a critical situation which requires regulations to test chemicals and ban those shown to be a hazard to our health and well being. Please reply too: Diane Brodd</p> <p>on behalf of Diane Brodd</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-20	<p>Comments on the California Green Chemistry Initiative I would like to add my support of the Green Chemistry Initiative to restrict or eliminate dangerous substances in California I would like to see this initiative include the problem of chemicals being used in our daily lives that have not been tested for neurotoxicity in children. I urge you to include restrictions and bans on chemicals that demonstrate a hazard to our health and/or environment. This is a critical situation that requires immediate attention by not only providing incentive programs but requiring restrictions and bans on those chemicals that are potentially dangerous.</p> <p>Please reply too: Linda Blackwell</p> <p>on behalf of Linda Blackwell</p>
F-GC-21	<p>CSPA Summary Comments on the California Green Chemistry Initiative Dear Director Gorsen: The Consumer Specialty Products Association (CSPA) has appreciated your continual efforts to include us in the discussions and stakeholder input on the Department of Toxic Substances Control (DTSC) California Green Chemistry Initiative. We also appreciate this opportunity to provide supplemental comments in addition to the information that we have provided on the "Conversation with California" website. CSPA is a national nonprofit trade association that represents more than 260 companies engaged in the formulation, manufacture, distribution and sale of consumer, institutional and commercial products. CSPA member companies manufacture and market a wide range of products, including: cleaning products, disinfectants and sanitizers, candles and air care products, household pesticide products, automotive products used to clean and maintain vehicles, and polishes and floor maintenance products. CSPA members are committed to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers. CSPA and our members support the broad goals of the Green Chemistry Initiative and look forward to working with DTSC and other stakeholders in the state to help spur green chemical innovation and ensure that products are safe.</p> <p>I. Background CSPA member products improve the quality of human life and are necessary to protect the public health against dangerous diseases, infestation, and unsanitary conditions. CSPA members are committed to providing products that are thoroughly evaluated for human and environmental safety and go through rigorous safety-based assessments before they are brought to market. CSPA members are also committed to clear and meaningful labeling on consumer products, i.e., label instructions are written to ensure that consumers use products in accordance with label instructions. Finally, CSPA members are committed to the development of green products that are safe for human health and the environment. In addition, CSPA members routinely apply green chemistry and green engineering principles in their operations and have been honored with awards for their efforts. The consumer products industry develops products that meet or exceed safety requirements of all state and federal agencies in the United States and Canada charged with regulating those products, including the California Department of Pesticide Regulation, the California Air resources Board, and other state agencies, U.S. Consumer Product Safety Commission (CPSC), the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the U.S. Food and Drug Administration (FDA), Health Canada, and Environment Canada. While we support the California Green Chemistry Initiative and believe there is much that can be done to address and spur the development of green chemical technology, CSPA believes that regulation of our members' products under current federal and state regulatory authorities provides safety and protection to consumers. Below is a short summary of the various regulatory authorities that ensure the safety of consumer products and their ingredients.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>While it is not an exhaustive list of the regulatory requirements these products undergo, it illustrates the extensive oversight that already surrounds the manufacturing and marketing of consumer specialty products.</p> <p>II. Toxic Substances Control Act (TSCA) The Toxic Substances Control Act (TSCA) gives EPA the authority to regulate chemicals produced or imported into the United States. EPA repeatedly screens these chemicals and can require reporting, testing or a complete ban of those that may pose an environmental or human-health hazard. Any person intending to manufacture or import a chemical substance first must determine whether the substance is listed on the TSCA Inventory. If it is not listed, the prospective manufacturer or importer must satisfy premanufacturing notice (PMN) requirements before commencing production or importation of the substance. In filing a PMN, the manufacturer or importer must give their identity, specific chemical identity, product volume, use, exposures (worker, user and consumer), and environmental fate. Additionally, any test data relating to environmental or health effects of manufacturing, processing, distributing, using, or disposing of the new chemical substance must also be submitted.</p> <p>The PMN must be filed at least 90 days prior to the commencement of commercial production or importation of a new chemical substance. EPA's review of a PMN consists of seven major stages designed to ensure that EPA examines all aspects of a new chemical, including its physical and chemical properties, potential toxicity, exposure of workers, users and consumers, and economic benefits. EPA has the authority to prevent, delay, or limit manufacture after the initial PMN review period ends. EPA can issue an administrative order regulating a new chemical substance if the Agency finds that there is insufficient information to reasonably evaluate the risk and either the chemical may present an unreasonable risk to health or the environment or it will be produced in substantial quantities with the result that either substantial quantities will enter the environment or there will be substantial or significant human exposure to the substance. While EPA does not require a designated set of toxicity testing to be included in the PMN submissions, it has identified several categories of chemicals and the concerns areas where it has required such tests. Under these requirements a company must provide information addressing these risk concerns or face restrictions based on default assumptions.</p> <p>EPA has broad authority to regulate the existing chemicals in commerce as well. If a chemical presents unreasonable risks to health or the environment, EPA must initiate a rule-making to regulate the chemical. As of 2007, EPA has issued over 1300 Significant New Use Rules, which restrict the manufacture, import, or processing of a substance .</p> <p>EPA can prohibit or limit the manufacture, processing, distribution, commercial use or disposal of the chemical; prohibit or limit the use of the chemical in a concentration above a specified level; require adequate warnings and instructions with respect to the chemical's use, distribution in commerce or disposal; require record-keeping; prohibit or regulate disposal of the chemical; and require notification to the purchasers or the general public about the risks involved and to replace or repurchase a chemical substance or mixture if requested. EPA also has the authority under TSCA to require manufacturers of substances to develop safety and environmental data.</p> <p>III. Consumer Product Safety Act (CPSA) The Consumer Product Safety Act (CPSA) provides that when the Consumer Products Safety Commission (CPSC) finds an unreasonable risk of injury associated with a consumer product it can develop a standard to reduce or eliminate the risk. The CPSA also provides the authority to ban a product if there is no feasible standard, and it gives CPSC authority to pursue recalls for products that present a substantial product hazard.</p> <p>The CPSC is authorized to set safety standards as to consumer product performance, composition, contents, design, construction, finish, packaging and labeling. In general, the manufacturer of a consumer product subject to regulation must issue a certificate announcing compliance with the applicable standards, and must label the product with the date and place of manufacture, the identity of the manufacturer, a certification of compliance with any applicable rule, and a brief description of such rule.</p> <p>Manufacturers are required to immediately notify the CPSC if it obtains information which reasonably supports the conclusion that a product: (1) fails to comply with a consumer product safety standard or banning regulation or a voluntary consumer product safety standard upon which the CPSC has relied</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>upon; (2) contains a defect which could create a substantial product hazard described in the CPSA; or (3) creates an unreasonable risk of serious injury or death.</p> <p>In the last ten years, CPSC obtained 472 voluntary recalls involving 110 million product units. During this time, CPSC obtained 1031 corrective actions (including recalls and other actions to keep unsafe products from consumers).</p> <p>IV. Federal Hazardous Substances Act (FHSA) The Federal Hazardous Substances Act (FHSA) requires labeling of hazardous substances sold to households. It prohibits the sale or introduction into interstate commerce any product which does not comply with the regulations. FHSA regulations provide specific guidelines to determine potential risks specific to the entire formulation and package. Product risk assessments are the basis for label decisions and precautionary label text to protect consumers and children. At a minimum, labels must include hazard signal word, affirmative statement of hazards, the name of each component that contributes to the hazard, and precautionary measures to be taken to avoid risk, required or appropriate instruction for first aid treatment, handling instructions, storage instructions, and "Keep out of reach of children."</p> <p>V. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) provides the basis for regulation, sale, distribution and use of pesticides in the U.S. FIFRA authorizes EPA to review and register pesticides for the specified use which a registrant applies for. Before registering a new pesticide or new use for a registered pesticide, EPA must first ensure that the pesticide, when used according to label directions, can be used with a reasonable certainty of no harm to human health and without posing unreasonable risks to the environment. To make such determinations, EPA requires more than 100 different scientific studies and tests for active ingredients. In fact, EPA has banned and severely restricted 64 pesticides in the United States. When EPA registers a pesticide, it approves the product's label, which includes (among other things) directions for use, hazard warnings, and precautions. It is a violation of FIFRA for any person to use a pesticide in a manner inconsistent with its EPA-approved labeling.</p> <p>EPA also has the authority to suspend or cancel the registration of a pesticide if subsequent information shows that continued use would pose unreasonable risks to health or the environment. EPA may decide to remove a pesticide from the market based on information from a variety of sources: new studies conducted by the registrant, the Government, or a third party; incident information submitted by a registrant; or results of the EPA's periodic review of pesticides and tolerances.</p> <p>EPA is currently completing a review of those pesticides registered before November 1984 to ensure that they meet current scientific and regulatory standards. This process, called reregistration, considers the human health and ecological effects of pesticides and results in actions to reduce risks that are of concern. Concurrently, EPA has begun a registration review process for those products registered subsequent to 1984 and for those pesticides that were review under the reregistration process previously. These ongoing review processes assure the continual reexamination of the safety and environmental profile of pesticides.</p> <p>EPA and the states enforce FIFRA primarily through stop sale, use, and removal orders, civil penalties, or a combination of the two. Unlawful acts under FIFRA include: selling an unregistered or misbranded pesticide; selling a pesticide whose composition differs from the one described in the pesticide's registration application, violating EPA's labeling requirements, failing to file annual production reports, and violating FIFRA's export requirements.</p> <p>VI. Recommendations for Product Stewardship & Safety-based Assessments As stated in our November 6 "Conversation with California" entry, CSPA supports company performed safety-based assessments of consumer products prior to the marketing of a product, that take into consideration all of the phases of a product's life-cycle. CSPA also supports appropriate use-restrictions for chemical ingredients when scientific safety-based assessments indicate that they cannot be used safely in a consumer product or use application. CSPA and our members believe that every responsible company should be performing these types of safety-based assessments and supports initiatives</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>that recognize companies for these types of procedures.</p> <p>In fact, CSPA has demonstrated our industry's commitment to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers, when we initiated our Product Care program in 2001.</p> <p>CSPA's Product Care program is a stewardship program for the consumer and institutional specialty products industry where participating companies have agreed to go beyond government regulations in emphasizing health, safety and environmental concerns by carefully designing products, purchasing raw material and packaging, operating safe manufacturing facilities, promoting safe storage and distribution, providing useful product information, answering consumers questions and anticipating product disposal needs. CSPA believes that these types of product stewardship programs should be considered as frameworks for programs developed under the Green Chemistry Initiative.</p> <p>Product Care provides a framework for companies to identify and commit to stewardship principles, share ideas and information and benchmark better performance. Participating companies have pledged to develop management principles for each of seven areas in a product's life cycle from development in a research facility through product use and disposal. Through this program Companies Must Commit to Evaluate:</p> <ol style="list-style-type: none"> 1. Product Design 2. Raw Material, Package and Service Supply 3. Manufacture and Production Site Management 4. Product Storage and Distribution 5. In-market Support, Incident Evaluation and Follow-up 6. Consumer Education and Outreach 7. Product Disposal <p>Stewardship did not begin when CSPA's Product Care program was initiated in 2001. Responsible companies have long followed policies promoting safe products that provide important health benefits while not adversely affecting the environment.</p> <p>CSPA believes it is vital that these types of product stewardship programs and companies that participate in these programs be recognized and fostered through any program developed under the Green Chemistry Initiative. In particular, CSPA believes that DTSC and California can leverage and recognize programs like Product Care as a way of encouraging companies to establish robust procedures to ensure product safety and environmental safety.</p> <p>VII. Recommendations for Chemical Data Development Initiatives</p> <p>Chemical data development efforts should build on existing statutory and regulatory structures, voluntary initiatives, and data development efforts. CSPA does not support California-specific data development requirements and pre-market approval process for chemicals or consumer products. However, CSPA supports collaboration by DTSC and California in ongoing work by other government agencies to assess chemicals and consumer products. Specifically, California and DTSC could leverage efforts by Health and Environment Canada in addressing priority chemicals in the Chemicals Management Plan. DTSC and California could collaborate with these agencies on their high priority list and avoid needless duplication of current data development and prioritization efforts. DTSC and California could also participate in the effort launched in August during the Security and Prosperity Partnership (SPP) with under the Montebello Agreement involving trilateral cooperation among the governments of Canada, the United States and Mexico to share chemical information and safety assessments.</p> <p>In addition if DTSC and California move forward with efforts to establish chemical priorities the process should be collaborative and should include scientific experts in toxicity and exposure, chemical manufacturers, consumer product manufacturers, and nongovernmental organizations. CSPA believes inclusion of manufacturers of the chemicals and consumer products could provide toxicity and exposure/use data to determine whether the uses of "priority chemicals" are safe or should be restricted.</p> <p>As referenced above, CSPA does not support pre-market approval of chemicals or consumer products, because this would be an incredibly burdensome</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>and expensive process for the State of California and would unnecessarily slow down the development of products. For example, the Department of Pesticide Regulation registers approximately 12,000 pesticide products sold in the State and in 2005-06 it cost the agency over \$17.5 million to review and approve these products . To require pre-market approval for the hundreds of thousands of chemicals and consumer products in commerce would be cost-prohibitive.</p> <p>VIII. Support for Appropriate Ingredient Disclosure</p> <p>Throughout Green Chemistry discussions and in recent market research consumers and others have expressed a desire to know what ingredients are in the products they use in their everyday life. These consumers are interested in having this knowledge in order to make informed product choices. It may appear that product ingredient information may not be readily available to consumers; however, our members willingly provide information to meet consumer needs. While some organizations have expressed concerns about ingredients in consumer products, much of this information is inaccurate. This is primarily due to the reliance on outdated resources that are dependant on old technologies or on assumptions made by sources that are not well versed in specific product chemistries.</p> <p>CSPA and our members support an appropriate approach to providing accurate information to consumers through ingredient communication. Our industry stands behind the safety of our products and the appropriate use of chemical ingredients in those products. We would like to work with DTSC and the State of California to implement a means of ingredient communication that would provide consumers with the information they can use to make informed decisions regarding the products they use in their homes.</p> <p>IX. Essential Principles for Green Chemistry Initiatives</p> <p>As any Green Chemistry program moves forward, CSPA believes, that in order for the effort to be credible and have a positive impact it must be structured in a way that includes all stakeholders and provides a sound scientific basis for the program. Specifically, Green Chemistry should ensure the safety of chemicals and consumer products through the use of sound science in the decision-making process. Additionally, green chemistry programs should be designed to ensure that products remain technologically and commercially feasible to produce; and that product efficacy, performance, and usability are not compromised or undermined. As such, Green Chemistry must foster innovation and not limit the development of new chemistry technologies.</p> <p>X. Support for Initiatives to Spur Green Innovation</p> <p>Stimulating green chemical innovation has been a core concept of the Green Chemistry Initiative, and discussion of this topic has shown the promise that new technologies have for improving the standard of life in California and reducing environmental impacts. CSPA supports collaborative efforts to encourage public and private partnerships with the goal of developing “greener” products and “environmentally responsible” ingredients rather than mandatory and voluntary state labeling programs that endorse green products or programs that stipulate a single third-party certification of green products.</p> <p>CSPA supports initiatives that provide incentives for companies that innovate and develop technologically and commercially feasible products using green chemistry. CSPA also supports recognition for companies that develop sustainable business operations, processes, and/or products. We also believe there are unique opportunities in California for research that identifies areas for the use of green chemistry in consumer products. Essential elements to ensuring that these technologies become widespread are implementing State policies that are designed to overcome barriers to commercial application of green chemistry research and development efforts.</p> <p>XI. Conclusion</p> <p>Once again, CSPA has appreciated DTSC’s efforts to include all stakeholders in the discussions during the California Green Chemistry Initiative. CSPA believes that the Green Chemistry Initiative holds incredible promise for helping spur green innovation in California. We also believe that the Initiative can leverage ongoing chemical data development initiatives in setting chemical priorities. Further, CSPA believes that DTSC should recognize and encourage</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>the current product stewardship procedures and safety-based assessments that companies perform prior to marketing a consumer product. CSPA would also look forward to working with DTSC and the State of California on an appropriate ingredient information system to help inform consumers when making their purchasing decisions.</p> <p>CSPA looks forward to continuing to work with DTSC through the Green Chemistry Initiative, as recommendations are developed, and CSPA hopes that our continued participation in this discussion will provide meaningful help to the endeavor.</p> <p>Please feel free to contact me directly at (202) 833-7328, or CSPA's in-state representation, Laurie Nelson at (916) 446-1111 if you have any questions about these comments.</p> <p>Respectfully Submitted, Andrew R Hackman Manager, State Affairs Programs</p>
F-GC-22	<p>Through Innovation, Education and Communication, we can improve our health and safety</p> <p>In order to design safer, less toxic products, we must have well-trained, knowledgeable scientists and engineers. Today, chemists, chemical engineers and most biologists receive absolutely NO toxicity training during their education. Students are usually familiar with unsafe compounds and how to work with them safely, but there is often little to no thought put into the safety of the end user when designing new products. This has been exacerbated in recent history as more and more companies become increasingly specialized and may have their starting material handled and processed by many other entities during the production process. An example in the news recently is that of phthalates in plastic children's toys. The chemist who designed the softer plastic using these chemicals probably didn't envision the wide array of products that would rapidly permeate our society. The original polymer mixture was then transferred through many levels of industry for processing, molding and final packaging before being brought to market. The engineer who designed the baby toys using these polymer mixtures probably had no idea there were phthalate monomers remaining in the plastic, much less the effects it might have if ingested. Neither of these characters is at direct fault--they are simply fulfilling the economic demand for materials with new properties and inexpensive products. In order to prevent toxic substances from making it into consumer homes, we need to look critically at the system that allows toxic chemicals to be used in consumer goods.</p> <p>This example highlights three issues that work together to cause the situation we have today: lack of testing, communication and reporting of potentially toxic compounds, lack of education and responsibility on the part of chemical producers and, I think most importantly, a lack of enforcement capabilities within our regulatory system. We rely on risk management policy which might sound like we "manage to avoid risk" but in actuality means we can't stop a chemical from making it to market until people are PROVEN to have been harmed by that very specific compound. And even if the product is removed, similar chemicals that vary by only one or two atoms, but are likely to have the same physiological consequences can remain in circulation. With the vast amount of chemistry, biology, epidemiology and toxicity knowledge we have today, there should be a better way. The idea of synergy, where the sum toxicity of compounds mixed together is more than the toxicity of the components alone, becomes important to think about because of the enormous variety and combination of chemical-based compounds in our modern society. All these issues point to the need for a more holistic approach to chemical policy and regulation.</p> <p>By adopting Green Chemistry policies and initiatives, most of these issues can be addressed. Integrating toxicity training and the green chemistry principles at all levels of the educational process, and having real-time monitoring and innocuous degradation of starting materials will help prevent end-user exposure. These are main tenets of the 12 Principles of Green chemistry, which if adopted and promoted could vastly improve the safety of chemical-based products. In addition, we need to change our current, risk-based method of policy making, which limits the scope of chemical evaluation</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>and puts people in harm's way before allowing the government to make chemical regulations. The only groups who benefit from "risk management" are chemical suppliers—they don't have to run toxicity tests or report their findings, they don't have to report quantities or end uses of potentially toxic substances, and they have no incentive to update manufacturing methods or reformulate, as that always comes with some monetary cost. They need markets and incentives to design better products, but won't comply without preventative regulation in place.</p> <p>Let's stop being reactionary and start being revolutionary. California is at the forefront of progressive policy and this is an extremely important issue that the European Union and many other countries have already begun to address. By adopting and practicing the green chemistry principles, in addition to a more preventative approach to policy making, we can demonstrate to the rest of the country that we can innovate and fulfill market demands while at the same time, protecting the health and safety of all living things</p>
F-GC-23	<p>ACC Final Comments to the "Conversation with California"</p> <p>The American Chemistry Council (ACC) is pleased to provide these comments as a final submission to the "Conversation with California" on the Department of Toxic Substances Control's (DTSC) Green Chemistry Initiative (CGCI). These comments supplement another ACC blog entry today that presents a proposal for DTSC's consideration ("ACC Proposals for Future Actions Related to California Green Chemistry Initiative").</p> <p>The CGCI has attempted to address a wide range of issues and approaches to promoting "green chemistry" in California. As we understand it, the input received by DTSC will be used to assess the options that can be presented to "establish the blueprint for keeping California in the forefront of protecting health and the environment in a robust economy. . . [and show that] California is leading the effort to fundamentally change the way it deals with its chemicals and waste."</p> <p>ACC believes that the overriding objective of the CGCI – "protecting health and the environment in a robust economy" – properly acknowledges that encouraging and sustaining a sound commercial economy is an important basis for "green chemistry." Indeed, ACC believes that "green chemistry" must be considered first and foremost a way of doing business, not a government mandate. As numerous commentators on green chemistry have acknowledged, green chemistry cannot be legislated, although both green chemistry and green engineering can be promoted and enhanced by appropriate policy decisions.</p> <p>Clearly proposals for additional regulatory requirements and for additional legislative authority may be part of the recommendations made by DTSC to CalEPA by mid-2008. Those proposals, however, should be based on a clear understanding of their objective, the likelihood that the proposals will achieve the objective, the time frame in which they can reasonably be implemented, and the likely positive and negative impact on California, including health, environment, and the economy.</p> <p>ACC believes that the largest single challenge for DTSC is bringing coherence to the hundreds of suggestions the Agency has received through the "Conversation with California" and the stakeholder meetings. The volume and breadth of the recommendations reflected in the "emerging options" paper does not, in our view, lead to any clear conclusions. Our comments below on each of the major categories reflected in the "emerging options" document are intended to focus on policy and program options that can be practically and pragmatically implemented, while achieving the overall objective of the CGCI.</p> <p>I. Policy Options</p> <p>The DTSC's recommendations to CalEPA should be built around a core set of reasonable policy options. A few recommendations have been made that California should adopt a "substitution" policy – a stated policy of forcing the substitution of hazardous chemicals for "less hazardous" alternatives. ACC believes that a substitution policy is impractical at best, and a negative disincentive for technological progress and innovation. "Green Chemistry" is not just about substitution of one hazard for another; it is ultimately about the reduction of risks to health and the environment that are otherwise unmanaged. Indeed, a risk reduction policy seems to ACC to be a much better approach to accounting for the economic, social, health, and environmental dimensions of green chemistry, particularly because by definition it will address not only inherent toxicity (hazard), but potential exposures as well. Perhaps most</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>importantly, a risk reduction policy (one that addresses both hazard and exposure) correlates very well with the pollution prevention policies that have been at the heart of many existing DTSC programs, and can serve as a meaningful focal point in encouraging the development of sustainable chemistry, green engineering, and products that improve the lives of Californians and the State environment.</p> <p>The successful implementation of a risk reduction policy requires a clear articulation of the objective, the various options for reflecting that objective in regulation, legislation, and programs, and the consequences and expected benefits of such a policy. Such an approach would suggest that DTSC needs to define success in this initiative, identify the problems that are in need of a solution, and assess the resources, tools, information, and mechanisms necessary to achieve those goals.</p> <p>ACC believes that California's primary objective should be the reduction of risks to health and the environment that are otherwise unmanaged or unacceptably under-managed. And to succeed in that objective, California must establish a process by which state-wide priorities can be identified, where existing and new risk reduction measures – spanning the entire spectrum from research and financial incentives to regulation – can be appropriately assessed, and where the relative benefits and impacts of the approach can be evaluated. In short, a risk reduction policy provides an important and appropriate organizing principle for DTSC's "Green Chemistry" recommendations.</p> <p>II. Legislation/Regulation</p> <p>Any legislative or regulatory proposals emerging from the Green Chemistry Initiative should be oriented toward proposals that support the underlying policy objective of risk reduction. As a practical matter, ACC agrees that chemical specific legislation may not be a practical way of using the State's resources to address critical risk related issues. For this reason, ACC believes that if DTSC determines that it needs a program specific to California, the key component of the DTSC's recommendations should be a proposal for a regulatory process that allows DTSC to identify key priorities and take appropriate action on those priorities.</p> <p>We want to be clear – ACC is not recommending that DTSC adopt a comprehensive chemical regulatory program. We believe that there are practical, pragmatic options for California far short of a California version of the federal Toxic Substances Control Act (TSCA), a California version of Europe's Registration, Evaluation and Authorization of Chemicals (REACH) program, or a California version of Canada's Chemical Management Plan. Each of those programs has or will produce information that is or will be useful to the State in identifying priority chemical risks that warrant reduction actions, without requiring the significant administrative infrastructure, costs, and burdens associated with a comprehensive chemical regulatory regime.</p> <p>DTSC has an important opportunity to consider how it can promote "green chemistry" by leveraging the significant work already done by many different organizations related to chemicals in commerce. ACC believes that in the vast majority of cases, information on particular chemicals, uses, or exposures is or can be readily available from a number of sources. Well-conceived options for additional regulatory authority should address how California can identify priority risks, appropriate information on manufacturing, import and use, and information on available risk reduction measures.</p> <p>We also want to be clear that if DTSC determines that it needs its own regulatory program specific to California, ACC is recommending that DTSC suggest narrowly drawn regulatory authority that assures that appropriate risk reduction strategies are developed and implemented for key chemical priorities. For example, a number of commentators to the "Conversation with California" have suggested that California needs to have a complete record of all chemicals in California commerce, whether manufactured or imported as discrete chemicals or as components of preparations or articles. ACC believes that such an approach is unrealistic and impractical, particularly given the relative benefit of such a system compared to its costs.</p> <p>Other commentators have made the simplistic suggestion that California should adopt Europe's REACH system. Those suggestions are made with little knowledge of the REACH legislation and its likely impacts. Few understand that REACH does not begin to operate until June 2008, and that the registration component will not be completed for 11 years. Few understand that the estimated costs of simple registrations and the use-specific licensing component of REACH (authorization) are now three times higher than they were when REACH was first being negotiated. Few understand that REACH does not result in a complete evaluation of all chemicals in commerce. And fewer still comprehend fully just how complex an 850 page regulation, and its</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>more than 4,000 pages of guidance, really is. DTSC must fully understand REACH before it commits to proposing such a regulatory system for the State. On the basis of the “Conversation with California”, however, the debate over REACH in California has been long on rhetoric but short on detail, and it would be premature at best for DTSC to include a REACH recommendation in its options. As ACC has noted in prior submissions, Canada, Mexico, and the United States agreed in August 2007 on a cooperative program to accelerate screening level risk management decisions for chemicals in commerce in North America. The program, commonly referred to as the Montebello Agreement, will result in decisions on a faster pace than REACH. The Montebello commitment is to complete the work by 2012. More importantly, that effort should produce information that California can access and use as the State reviews priority chemicals.</p> <p>III. Compliance and Enforcement DTSC’s “emerging options” document contains several recommendations aimed at compliance and enforcement issues. In general, it will be difficult to enforce broad concepts of “green chemistry,” largely because what constitutes “green chemistry” (or green engineering) will differ depending on the product, process, company, or industry involved. To the extent that regulatory actions are recommended by DTSC, appropriate enforcement measures will likely need to be considered. It is critical that those enforcement measures be capable of uniform application. In addition, ACC believes that California should address what steps might be necessary to deter false claims of “green-ness” that mislead consumers and distort the market.</p> <p>IV. Data/Information As ACC has noted in other “Conversation with California” submissions, California does not need information on each and every chemical in commerce, it needs information on chemicals considered priorities by the State. A number of sources for supporting information already exist, and we urge DTSC to rely on existing information as a first, but necessary, step. Only when potential data gaps are understood can approaches to filling specific data needs be addressed. Many of those sources are already being linked in broader web-based portals, by institutions such as the Organization for Economic Cooperation and Development (OECD). Moreover, those information sources are complemented by data and information provided by industry in programs like the High Production Volume (HPV) Challenge, and the Voluntary Children’s Chemical Evaluation Program (VCCEP). In submissions to the “Conversation with California,” some have suggested requiring extensive new laboratory animal testing, while others have opposed testing altogether. ACC encourages the use of alternatives to animal testing when these alternatives are scientifically valid and predictive and acceptable to regulatory bodies. Furthermore, experience has shown that arraying toxicity tests in a tiered framework, drawing upon standardized study protocols to develop data on toxicologically relevant endpoints for assessing human health hazards, applying this information to groups or series of similar chemical substances provides scientific rigor and at the same time provides flexibility to account for differing chemical toxicities and to address specific concerns associated with existing or anticipated exposures to specific chemicals. In this manner, tiered testing focuses efforts to collect data where it is most needed, promotes screening of the greatest number of prioritized chemicals (or classes of chemicals) and, where indicated by specific toxicity results, indicates which substances pose a particular concern and points to the specific, more complex test that should be considered. Thus, tiered-testing and risk-based approaches are both efficient and effective in protecting human health. ACC also believes that the Montebello Agreement recently concluded by Canada, Mexico, and the United States deserves considerable attention by DTSC. Under the Agreement, the U.S. Environmental Protection Agency has committed to completing screening level risk management decisions on nearly all chemicals in commerce. More importantly, the commitment is to complete those reviews by 2012, thereby providing a basis for identifying chemicals that pose priority health or environmental risks. That information will include both hazard and exposure related information, and will be an important data source that California should rely on. ACC believes that DTSC should not wait for the conclusion of the CGCI to engage in discussions with U.S. EPA and the Canadian government on how the State can coordinate with and leverage those programs in support of the CGCI. Several options outlined in the “emerging options” document suggest that California should adopt a “no data, no market” approach. While the approach</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>may initially seem attractive, the scope of the requirement will obviously determine its potential utility and impact. ACC believes such a requirement implies that California wants all information on all chemicals, and as we have stated earlier, there are significant resource implications from that approach. Perhaps more to the point, for the vast majority of chemicals, such a requirement will have little or no marginal benefit for health and environmental protection. Under the Canadian Chemical Management Program (CMP), for example, some 19,000 chemicals did not meet the criteria used for categorization and do not need further action at this time. A simplistic approach to a “no data, no market” requirement has the potential to require a significant duplication of effort for both the State and the regulated community.</p> <p>V. Education/Outreach</p> <p>ACC concurs with many of the comments reflected in the “emerging options” document on education and outreach about “green chemistry.” There are several dimensions to the education and outreach issues.</p> <p>First, there is a need for education that the broad scope of “green chemistry” includes “green engineering,” and that it is not limited to simplistic hazard substitution. Moreover, a concerted effort to disseminate appropriate information on the accomplishments, best practices, costs, and benefits of “green chemistry” would help assure that all interested stakeholders understand the concept and limitations of the approach. ACC believes that suggestions to require that manufacturers publicly disclose the chemical content of their products could be considered in circumstances where it is clear that proprietary information is not compromised. We have made clear in other submissions to the “Conversation with California” that ACC members believe health and safety information should never be considered proprietary or confidential information.</p> <p>Second, there have been a number of excellent recommendations for enhancing academic curricula, particularly at the post-secondary level, to cover topics related to green chemistry. Expanded training opportunities in toxicology (both human and environmental), exposure assessment, life cycle analysis, and risk assessment make sense.</p> <p>Third, ACC agrees that one option to establish California as a locus of “green chemistry” may be the creation of a separate organization, perhaps one affiliated with the University of California system or other academic institution. However, it should be recognized that a number of similar institutions already exist throughout the world, and California should have a complete understanding of the purpose and objectives of such an institution before recommending its creation.</p> <p>VI. Incentives</p> <p>ACC also agrees that a series of well-conceived and well-executed incentive programs can help create a better understanding of and commitment to “green chemistry.” Many of the options discussed through the “Conversation with California” warrant additional consideration.</p> <p>For example, there have been several suggestions that California should subsidize the market for “green” chemical products. While notionally attractive, ACC believes that there needs to be clear criteria for what constitutes a product or process that qualifies for support, and clear criteria for assessing whether there are market failures that such support can remedy. Suggestions for fee rebates appear to be based on an assumption that industry will be paying fees, although for what remains little understood. Other options, such as low interest loans, or grants, or tax incentives (like tax “holidays”) may also be appropriate.</p> <p>ACC disagrees that it is necessary to strengthen product liability law to provide a greater incentive for consumer protection from potentially harmful toxic exposures. California (and indeed the United States in general) already has a robust civil liability system that provides significant incentives to manufacturers (not just those located in California) to take steps to protect consumers from potential exposures to harmful chemicals.</p> <p>VII. Research/Technology</p> <p>One of the most exciting components of the Green Chemistry Initiative is the potential to greatly expand research and development. As California no doubt recognizes, the chemical industry invests billions of dollars each year in fundamental research and development. One out of every four U.S. patents</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>are related to chemistry, an indication of just how robust R&D is in the field – and an indication that the business of chemistry is in fact the Nation’s most innovative business segment. ACC believes that a set of clear criteria and objectives for partnerships with California (either businesses or academia), and an understanding of how California would approach the ownership of the intellectual property associated with such research, would help assure that companies are aware of the opportunities for support for R&D activities.</p> <p>VIII. Voluntary Measures ACC believes that any regulatory or legislative proposals suggested by DTSC should include an explicit acknowledgement of the value of voluntary programs – and an explicit compliance exemption for companies that comply with programs that meet certain criteria. In particular, California should explicitly recognize those industry-wide programs that have credible, publicly-reported performance metrics, and credible, third-party assessment and certification requirements. In some cases, compliance is a requirement of membership in an industry association or organization. Programs like these include management system approaches that address chemical product evaluations, including assessments of manufacturing processes and intended uses, among others. Explicit recognition of these systems will provide an important incentive for companies to demonstrate their performance in compliance, and would leverage scarce resources in both California and throughout the industry.</p> <p>IX. Funding ACC understood many of the comments in this category of the “emerging options” document to be directed at the question of how the State of California will fund their activities under a Green Chemistry Initiative, including regulation, compliance, and training programs, rather than funding incentives for cooperative research and development. ACC does not support the imposition of fees to support a Green Chemistry Initiative in the abstract. Similarly, ACC does not support the imposition of a surcharge on chemicals, or products made with chemicals, to fund activities to address long term environmental impacts. ACC believes the basis of a surcharge is problematic. For example, is the surcharge to be assessed on the first use of a chemical (or the use of virgin materials), or for the possible consequences of use of the product? Other suggestions in this area included fees on the mere use of toxic substances, which would then be used to fund government toxics use reduction activities, including data analysis and the provision of technical assistance. ACC believes that, should California believe there are general benefits to be obtained from government agency activities in “green chemistry,” those activities should be funded by general tax revenue. * * * * *</p> <p>Finally, ACC believes that given the broad range of public input solicited and gathered by DTSC throughout the “Conversation with California”, the Department should consider providing an opportunity for public comment on its proposed recommendations to CalEPA and Governor Schwarzenegger. Publication of the proposed recommendations will provide a critical insight into how DTSC views the Green Chemistry Initiative and the opportunities to take short and long term action in the arena.</p>
F-GC-24	<p>ACC Proposals for Future Actions Related to California Green Chemistry Initiative The American Chemistry Council (ACC) is pleased to provide the proposals and rationale for those proposals outlined below for consideration by California as it moves forward with the Green Chemistry Initiative.</p> <p>PROPOSAL: INFORMATION ON CHEMICAL EVALUATION APPROACHES A company that manufactures chemicals in and/or imports chemicals into California should have a publicly available overview of the approach it uses for chemical evaluation and assessment. Companies should affirm to the state that the chemical evaluation and assessment approach is publicly available. RATIONALE: Responsible companies conduct systematic and rigorous evaluations of their chemical products to assure that these products deliver their intended benefits, while protecting public health and the environment. These evaluations should include characterizations of risk associated with the use of the chemical products and a determination of any risk management precautions and activities needed to address that risk. California public</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>stakeholders would benefit from a greater understanding of how product safety and management decisions are made. Implementing this recommendation would have a minimal cost-impact to the State.</p> <p>PROPOSAL: MANAGEMENT SYSTEMS A company that manufactures chemicals in and/or imports chemicals into California should have a management system that includes process and product safety elements. Company systems should be subject to third party certification by representatives of a nationally recognized auditing Board (e.g., Board of Environment, Health and Safety Auditor Certifications or ANSI-ASQ-National Accreditation Board). Companies should affirm to the state that the management systems are in place and that third party certification has occurred.</p> <p>RATIONALE: Industry and government experience in applying management system principles to safety and environmental issues has shown that this organizational approach is both prudent and effective. A management system is a recognized business management practice that allows an organization to strategically address its environmental, health and safety matters. System implementation reflects accepted quality management principles based on the "Plan, Do, Check, Act," model using a standard process to identify goals, implement them, determine progress, and make improvements to ensure continual improvement. Properly implemented, a management system not only improves environmental and health and safety performance, but also increases overall efficiency and accountability. Implementing this recommendation would have a minimal cost-impact to the State.</p> <p>PROPOSAL: STATE RESEARCH & DEVELOPMENT CENTERS The state of California should establish research and development centers focused on sustainable chemistry and/or sustainable engineering within its University of California system, such as Centers for Excellence in Sustainable Chemistry at leading University of California campuses that are networked to address major sustainability opportunities and issues.</p> <p>RATIONALE: California should utilize its well-known and respected university system and professional associations in efforts to promote innovation through research programs in sustainability. These programs could include non-proprietary or pre-competitive work.</p> <p>PROPOSAL: CURRICULUM FOR CHEMISTRY DEGREES California should make risk assessment, including toxicology and life cycle thinking, part of the required curriculum for chemistry and/or chemistry related degrees conferred by State institutions.</p> <p>RATIONALE: California could be a leader in promoting appropriate and necessary curriculum for future chemists. This curriculum would ensure that as future chemists develop new products, they fully appreciate the potential impacts of such products on health and the environment. Dr. John Warner's Green Chemistry graduate curriculum at the University of Massachusetts – Lowell is a possible example for consideration.</p> <p>PROPOSAL: FINANCIAL INCENTIVE AND RECOGNITION AWARD PROGRAM California should establish an awards program to provide financial incentive and recognition for innovations. This program should be open to all sectors of the chemistry enterprise – including manufacturers, users, academic and government entities. Options for such a program could include grants, licensing fees or other income to researchers who develop innovations in non-proprietary or pre-competitive work.</p> <p>RATIONALE: Innovation results should be encouraged through financial incentives and recognitions.</p> <p>PROPOSAL: VALUE CHAIN COMMUNICATION California should encourage companies in important value chain sectors to identify information needs of the value chain's members (upstream and downstream companies) and to establish communication processes to meet those information needs</p> <p>RATIONALE: By facilitating the flow of hazard and safe handling information along the value chain, California will enable companies within a value chain sector to access and apply risk information for its own operations and for its own products</p> <p>PROPOSAL: REGULATORY PROGRAM BUILT ON LEVERAGED INFORMATION</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>If DTSC determines that it needs its own regulatory program specific to California, it should adopt the output of the Canadian Chemical Management Plan (based on Canada's categorization and prioritization of the existing chemical inventory) as a solid, scientifically sound foundation. The program should also leverage information that will be generated under the August 2007 Montebello Agreement between Canada, the United States and Mexico.</p> <p>If needed DTSC could establish a California-specific chemical evaluation process to address circumstances in which DTSC identifies uses of concern for priority chemicals that were not on the original CEPA categorization process or that will not be addressed under the Montebello Agreement in the timeframe required by DTSC. The process should utilize a tiered approach, in which chemicals and their uses are prioritized for further evaluation. The process should also utilize risk-based screening and should focus on potential "data needs" versus "data gaps". Producers and users of identified priorities should be engaged in a collaborative process to bring hazard, use and exposure information to improve decision-making. As DTSC proceeds with its process, it should leverage information already generated or that will be generated under regulatory or voluntary chemical evaluation programs. DTSC must be transparent in the processes used to make risk evaluation and risk management decisions.</p> <p>RATIONALE: In order for DTSC to conduct evaluation work in a timely manner, it cannot afford to work in isolation. Establishing an entirely new prioritization program would take years of development before implementation could even begin. Instead, DTSC will need to build from the foundation of an established process and to leverage evaluation work generated by other parties.</p> <p>Stakeholders in California have publicly supported the Canadian Chemical Management Plan based on Canada's categorization and prioritization of the existing chemical inventory. California's collaboration with Canada on this process will accelerate progress in both geographies.</p> <p>The August 2007 Montebello Agreement between the US, Canada, and Mexico will result in significant chemical evaluation work being completed in a relatively short timeframe. DTSC should take advantage of the upcoming work to be conducted by the US, Canada, and Mexico. This would clearly allow DTSC to save time and resources, while advancing the protection of health and the environment. It would also allow DTSC to be viewed as a global leader in integrating the Montebello evaluation outcomes into its own process.</p> <p>If DTSC intends to move forward in the most time-effective manner possible, it must also recognize that a prioritization of chemicals is essential. A set program, with a specific list of chemicals and uses to address in a tiered fashion will provide the structure needed to make progress. If everything is a priority, then nothing is a priority – and nothing gets accomplished in a timely manner.</p> <p>Recognizing time limitations, as well as stakeholder concerns with un-necessary animal testing, DTSC must be pragmatic in leveraging existing information that support the DTSC's overall program. This could include data submitted under regulatory programs, such as the 2006 Inventory Update Rule data that could be used to develop an initial understanding of volume, use and exposure and to assist in identifying uses of that raise the greatest concern. It should also include information generated under voluntary chemical evaluation programs, such as the High Production Volume Challenge.</p>
F-GC-25	<p>Sustainable Flame Retardant Design-Albemarle Corporation Sustainable Flame Retardant Design</p> <p>Albemarle is a responsible manufacturer and developer of specialty chemicals including halogenated, phosphorus, and mineral flame-retardants. When developing new flame-retardants, Albemarle includes several sustainable design considerations during the development and commercialization of flame-retardants.</p> <p>The World Commission on Environment and Development defines sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". Albemarle believes strongly that the world needs strong fire safety in our homes, workplaces, and transportation and that sustainable flame retarded materials should be available and can be developed to meet these needs.</p> <p>Sustainable Flame-retardant design starts with the basic guiding principle that substances that are bioaccumulative or toxic will NOT be considered as</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>candidates and will be screened out during the early developmental stage. Albemarle will develop effective flame-retardants that will remain stable and fully available to perform their fire safety task while remaining in the polymer matrix until such times that they are needed. For thermoplastic formulations these systems will be recyclable as the flame retardant will be stable in the polymer matrix and not degrade during many recycles thus allowing the polymer to be re-used in many applications.</p> <p>Green chemistry consideration is also a very important element of the Albemarle Sustainable Flame Retardant Product Design Process.</p> <p>12 Principles of Green Chemistry *</p> <ol style="list-style-type: none"> 1. Prevention of waste It is better to prevent waste than to treat or clean up waste after it has been created. 2. Atom Economy Synthetic methods should be designed to maximize the incorporation of all materials used in the process into the final product. 3. Less Hazardous Chemical Syntheses Wherever practicable, synthetic methods should be designed to use and generate substances that possess little or no toxicity to human health and the environment. 4. Designing Safer Chemicals Chemical products should be designed to affect their desired function while minimizing their toxicity. 5. Safer Solvents and Auxiliaries The use of auxiliary substances (e.g., solvents, separation agents, etc.) should be made unnecessary wherever possible and innocuous when used. 6. Design for Energy Efficiency Energy requirements of chemical processes should be recognized for their environmental and economic impacts and should be minimized. If possible, synthetic methods should be conducted at ambient temperature and pressure. 7. Use of Renewable Feedstocks A raw material or feedstock should be renewable rather than depleting whenever technically and economically practicable. 8. Reduce Derivatives Unnecessary derivatization (use of blocking groups, protection/ deprotection, temporary modification of physical/chemical processes) should be minimized or avoided if possible, because such steps require additional reagents and can generate waste. 9. Catalysis Catalytic reagents (as selective as possible) are superior to stoichiometric reagents. 10. Design for Degradation Chemical products should be designed so that at the end of their function they break down into innocuous degradation products and do not persist in the environment. 11. Real-time analysis for Pollution Prevention Analytical methodologies need to be further developed to allow for real-time, in-process monitoring and control prior to the formation of hazardous substances. 12. Inherently Safer Chemistry for Accident Prevention Substances and the form of a substance used in a chemical process should be chosen to minimize the potential for chemical accidents, including releases, explosions, and fires. <p>* Anastas, P. T.; Warner, J. C. Green Chemistry: Theory and Practice, Oxford University Press: New York, 1998, p.30. By permission of Oxford University</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>Press from ACS Green Chemistry Institute Webpage</p> <p>When new flame retardant commercial targets are defined, our process development focuses closely to developing commercial processes that conform closely to the Principles of Green Chemistry. Most of our flame retardant processes are substantially “Green” and future processes will be even more so. Additionally, we are now also in the process of formalizing a metric in our internal evaluation of processes to prepare sustainable flame-retardants. Green chemistry process development is encouraged and rewarded.</p> <p>An important aspect of sustainable flame retardant design beyond the molecule or its process is the physical form of the product. We are now in the processes of developing new technologies to produce our existing powder products in a dust-free pelletized form. We are developing several new flame retardants for the future that have very attractive product forms that are largely dust-free and much easier for our customers to handle. Dust-free forms make it easier for customers to control their emissions to very low levels and thereby keep flame-retardants in the plastics and not in the environment at either point of manufacture or point of initial use.</p> <p>Finally, product stability is an important criteria for a sustainable flame retardant. Flame-retardants basically sit silently in the resins they protect, often for many years until such time they are needed. In most cases, their fire safety service is never required. But throughout the life of the product that they protect they must be fully available and largely unchanged from the day they were manufactured. The persistence of the product is therefore critical to its long-term effectiveness. This high degree of stability is also important as recycle and reuse of flame-retarded resins is becoming widespread.</p> <p>David W. Owens Director of Polymer Additives R&D Albemarle Corporation Baton Rouge, LA.</p>
F-GC-26	<p>Some Principles for Consideration BSEF FEEDBACK TO CA GREEN CHEMISTRY INITIATIVE</p> <p>The Bromine Science and Environmental Forum (BSEF) is an association of the bromine industry with a mission to generate scientific data that will allow informed discussion of bromine and bromine compounds.</p> <p>BSEF supports the California green chemistry initiative, and believes that the following issues need to be addressed in a workable policy.</p> <p>1. A Science Based Process</p> <p>Decisions should be based on high quality scientific data. Many toxicological studies are long and complex, and the interpretation of results requires great experience. It is recommended that the target for significant studies should be GLP (good laboratory Practice) standard. We also believe that data from studies should be available to all, but this does raise issues concerning future use of data by third parties who have not shared in the significant costs often associated with test work. Within the process there needs to be a mechanism that does not allow a “free rider” to benefit from the work of others. As far as possible the data required for chemical evaluation should be harmonized with the data requirements of other regulatory jurisdictions. In practice we would suggest persistency, bioaccumulation potential, toxicity (PBT) characteristics, and carcinogenic, mutagenic and reprotoxic (CMR) characteristics form a suitable base line for decision making. Use of these factors makes most efficient use of data generated and avoids unnecessary additional testing. We support the goal of minimizing animal testing.</p> <p>2. Risk and Benefit</p> <p>The decision making process should weigh risk against benefit. Simply identifying a hazard associated with a chemical, or detecting a chemical in the environment is not sufficient to justify replacement of a chemical. Risks need to be evaluated and full advantage taken of risk management measures to</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>allow continued use of materials that bring clear benefit to society.</p> <p>3. Encourage Best Practices Throughout the supply chain and through the life cycle of a given good there should be positive incentives to drive best practice. An example of such best practice is the Voluntary Emissions Control Action Plan (VECAP) introduced by our industry to reduce emissions during manufacture and use of flame retardants.</p> <p>4. Evaluate the merits of individual chemicals Keep evaluations focused on significant individual chemicals. It is not justified to apply a broad brush and try to regulate entire classes of chemical as has been suggested by some.</p> <p>5. Informed Substitution When considering alternatives that might be used for a particular function it is important that the alternatives have also undergone a thorough evaluation. Failure to do this can reward lack of data, and may simply create new problems for the future.</p> <p>6. Industry Self Classification The concept of self classification of chemicals by the producer or importer should be examined. This puts appropriate responsibility on producers and importers to assess the impact of their products. Proposed classifications should be open for final review and decision by CA EPA or panels appointed by CA EPA.</p>
F-GC-27	<p>Feedback from Albemarle Europe Stimulating Green Chemistry There is a lot of discussion around green chemistry & incentives around greening the world. One question which remains unanswered is what is the definition of "green"? Being able to define a substance as green would imply in-depth knowledge of the hazard properties of the substance, of the toxicological profile of the substance, of the risks the substance poses, of the impact the substance has through it's life-cycle on human health & the environment, and also detailed understanding of how the substance can best be managed - be that the case - taken into account it's profile of the substance.</p> <p>This initiative would provide an excellent platform to discuss in to greater detail the definition of green chemistry, in order to provide a common understanding applicable in an objective manner to all chemical substances</p>
F-GC-28	<p>Perspective of Affected Industries on California Green Chemistry Initiative The below listed organizations appreciate the opportunity to provide comments on the California Environmental Protection Agency's (CalEPA) Green Chemistry Initiative. Our organizations represent many of California's and the nation's leading industries and employers. We fully support science and risk based chemicals management policies which protect health and the environment while assuring product safety and efficacy and promoting innovation in the marketplace in California.</p> <p>Chemistry is at the foundation of a wide range of industries. The science of chemistry helps to make the lives of Californians and others throughout the world safer, healthier, and more productive. Chemistry goes into modern materials used to make insulation, weatherization equipment, firefighting and other emergency response equipment, lightweight vehicle parts, coatings, lubricants, and energy-efficient appliances. Just a few of the many industries that use chemical or chemical-derived products include farming, new residential construction, emergency response services, plastic bottle manufacturing, electronics and high-technology, consumer products manufacturing, upholstered furniture manufacturing, dry cleaning services, building services and health care.</p> <p>We support the statement of CalEPA Secretary Linda Adams that this "...strategy, and the policy it champions, must have at its core and be governed by sound science." Advancements in science make possible product innovations that meet consumer needs, while increasing knowledge about the safety of</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>chemical products and protecting the environment. A science-based assessment that evaluates human health and environmental considerations, performance, and cost and feasibility must include an examination of traditional and alternative technologies, materials and processes. Incentive-based approaches can allow companies to more easily and effectively share this knowledge, best management practices, and opportunities. Our industries and employees appreciate California's leadership in undertaking a comprehensive, scientific and risk based approach to this complex issue.</p> <p>Adhesive and Sealant Council American Chemistry Council AeA (American Electronics Association) American Sportfishing Association Association of Woodworking and Furnishings Suppliers California Chamber of Commerce California Circuits Association California Manufacturers and Technology Association California Paint Council Chemical Industry Council of California Consumer Specialty Products Association Flavor and Extract Manufacturers Association Fragrance Materials Association Grocery Manufacturers Association Independent Lubricant Manufacturers Association International Association of Color Manufacturers International Sleep Products Association IPC – The Association Connecting Electronics Industries National Association of Home Builders National Paint and Coatings Association NFIB – California Soap and Detergent Association Society of American Florists U.S. Chamber of Commerce</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
F-GC-29	<p>Use of existing data and tools to implement the Green Chemistry Initiative DTSC should look at the procurement and / or contractual use of existing data and software tools to implement the Green Chemistry Initiatives for the short-term and long-term program needs. Previous posts have indicated various available existing chemical data systems and tools, including Chemical Compliance Systems, the Canadian efforts, and the European REACH program. Use of these types of tools could facilitate implementation of voluntary and/or regulatory programs in the near future as a beginning effort and establishment of a foundation, to be built upon in future developments, meeting the Green Chemistry initiative goals and objectives. One example of a potential use of existing tools is the establishment of a product “green” certification program which would allow consumers to readily identify green products. This type of program is already available via use of Chemical Compliance Systems data tools that can provide an automated “Green” assessment of chemical products which can be readily tailored for use in California. The use of such existing programs can provide efficiency through the avoidance of “re-inventing the wheel” and expanding on proven technologies and / or approaches.</p> <p>Through the procurement and / or contractual use of existing data and software tools, DTSC should establish programs and/or partnerships by which these types of tools and data can be made available to other stakeholders (such as product manufactures, business and private consumers, other government agencies, etc.) on a free or lower-cost basis for the purpose of meeting or promoting the Green Chemistry Initiative goals and objectives.</p>
F-GC-30	<p>Comments from Albemarle Corporation ALBEMARLE FEEDBACK TO CA GREEN CHEMISTRY INITIATIVE</p> <p>Albemarle Corporation remains committed to the creation and supply of sustainable chemicals that contribute to the well being of mankind and the environment. As such we are supportive of the initiative in California to develop a clear process for the evaluation of chemicals and their application areas. We believe that a well-conceived process is necessary for sound decision-making that can address the concerns of the broad range of economic and environmental stakeholders.</p> <p>The following elements, we believe, are part of such a policy:</p> <ol style="list-style-type: none"> 1. Decisions need to be based on high quality science, for example testing to GLP standards 2. Harmonization of data requirements with other regulatory jurisdictions 3. Decision making should be based on evaluation of risk, not just hazard . Ongoing minimization of risk is a target. 4. Benefits derived from a chemical’s use should be factored into decision making. 5. There should be ready access to data used to support conclusions 6. All stakeholders should have opportunity to participate 7. There should be positive incentive for introduction of best practices 8. There should exist a framework for incremental improvement 9. There should be recognition and approval for products meeting acceptance criteria 10. Substitution decisions should be informed in terms of the characteristics and risks presented by potential alternatives <p>The following addresses more specifically the four challenge areas identified. Cradle to Cradle</p> <p>The risks associated with a particular application area of a chemical need to be evaluated on the basis of a full life cycle assessment (LCA). Risk should be understood to take into account the inherent hazard possessed by a given chemical and the exposure that humans or the environment have to the chemical through the life cycle of its application. It is feasible that hazardous materials can continue to be used as long as the risks associated with their</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>use are acceptable. As an example, Swedish LCA assessment of televisions containing flame retardants compared with televisions containing no flame retardants showed that the FR containing televisions put less burden overall on the environment than televisions with no flame retardant. This was because the higher rate of fires, and any environmental impact of those fires more than offset the environmental burden from the flame retardant.</p> <p>A second example, might be that a chemical that allows ready recycling is to be preferred over one that does not, even though in isolation the eco-tox profile of the first chemical appears less attractive than the second. Even when risks are judged acceptable, there should be ongoing programs to minimize the risk. Fundamentally the goal is to drive risk to zero. This is achieved by a combination of hazard reduction and exposure reduction. At Albemarle Corporation we have programs in place with the goal of achieving zero emissions of chemicals from our production facilities and those involving our products at our customers. Green procurement policies at state and municipality level can be used to give the incentive to drive best practices to minimize risk. A major element in evaluating life cycle impact is end of life disposal of finished goods, and policy should drive and reward effective recycling. A major challenge facing us today is the how to deal with electronic waste. We believe that an integral part of the green chemistry initiative should address electronic waste disposal and the applicability of a product to recycle. To this end we believe that the opportunity for a collaborative industry / state initiative to develop solutions such as an in-state smelting facility should be explored. The technology exists for recovery of valuable metals, other chemical starting materials, and energy in the safe disposal of electronic waste.</p> <p>Stimulating Green Chemistry State procurement policies provide an effective vehicle for promoting green chemistry. Such economic incentive will be powerful in driving towards green targets. The creation of a “green chemistry scorecard” for suppliers would allow specific materials and their applications to be rewarded through favored purchasing policies. Such an approach also provides the opportunity for incremental improvement as producers demonstrate capability to meet more voluntary criteria beyond a minimum base line. As time passes the criteria can be reviewed and targets raised to drive further performance. As discussed above, the opportunity for California to work with industry partners to promote effective end of life strategies such as smelting or recycling of electronic waste can potentially provide an economically viable resource for California, and one that also provides a solution for other states in terms of disposal of their electronic waste.</p> <p>Toxics by Design The chemical industry or chemical importers should take the responsibility to describe the environmental characteristics of their products. The financial burden of testing chemical products appropriately lies with the producer or importer. Such testing should be carried out at independent test facilities, and it may be beneficial to California to encourage the creation of such test centers within the state – either as independent entities or as part of the CA University system. Self certification by the producer would be based on independently run tests of a chemical’s characteristics in terms of whether the chemical should be considered persistent, bio-accumulative, and toxic (PBT), or should be considered a very persistent and very bio-accumulative (vPvB), or should be considered to have significant possibility of being carcinogenic, mutagenic, or reprotoxic (CMR category 2). These classifications are well recognized in global regulatory systems, and the data necessary for such classifications can be clearly defined. The data and rationale behind the assessment shall accompany the submission. The submission would be reviewed by the CA EPA and final determination of the chemical’s classification will lie with CA EPA. At the discretion of CA EPA, appropriate stakeholder involvement in this process can be encouraged. Materials classified as PBT, vPvB, or CMR category 2 should be subject to risk analysis. This is a primary focus for any policy – to address materials having clear areas of concern. If risk levels are judged too high, then industry should have the opportunity to introduce appropriate measures to reduce risk within a given time span, or face phase out of the material. Again the concept is to drive improvement where possible. Within a phase out strategy, the</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>potential use of alternatives must address any risks associated with such substitution. It should not be acceptable to propose substitution by a material for which there is little data on its characteristics. Fundamentally, lack of data should not be rewarded.</p> <p>Even when there are acceptable risk levels, continued risk reduction should be encouraged and rewarded. Incentives could be given to develop products with improved characteristics, e.g. non-PBT or polymeric chemical additives. Similarly, improved stewardship, such as driven by the BFR industry's Voluntary Emission Control Action Program (VECAP) should be encouraged and rewarded.</p> <p>Materials not classified as above, should be approved for use, unless there is a clear concern identified. Ideally all materials should be subject to risk analysis, but this may not be practicable.</p> <p>Toxics by Accident</p> <p>The basic classification of a given material can be addressed as described in the preceding section, but the important difference here is that the hazard presented by a material is not associated with the primary chemical, but with by products that are not integral to the materials function. In such a circumstance the opportunity for risk reduction by means of by product elimination should form an important element of ongoing risk reduction strategy. Where risks are unacceptable this has to be a part of the risk management program to bring risk within acceptable levels. Where risk levels are deemed acceptable, continued improvement can still be driven by procurement incentives.</p>
F-GC-31	<p>Science base for moving to low hazard chemicals</p> <p>Maureen Gorsen Director Department of Toxic Substances Control California Environmental Protection Agency</p> <p>Dear Ms. Gorsen:</p> <p>Thanks for the opportunity to provide suggestions for how to move to a system that eliminates hazardous chemicals from homes, products, and environments.</p> <p>To move toward safer chemicals requires that we replace systems that are slow and ineffective with systems that are faster, more effective, and capable of integrating new scientific understanding.</p> <p>This is a big challenge, and it will be important to engage all of the State's expertise to this end. Key elements are noted below.</p> <p>I. Assessing and characterizing hazards of chemicals ---</p> <p>As has been pointed out by many authors, neither the US nor the State is systematically assessing and characterizing the hazard traits of chemicals in use or proposed for use.</p> <p>Accurate characterization of the hazards of chemicals is needed to make choices that move toward greener and safer products, to distinguish between higher and lower hazard compounds. Several components can contribute to this.</p> <p>A. Address all of the hazards, not just a few ---</p> <p>Accurate and reliable assessment and characterization must address all of the hazards of chemicals, not just a few of them. Right now assessment and characterization focuses primarily on cancer and reproductive/developmental toxicity. This is not consistent with current scientific knowledge.</p> <p>B. Adopt a proactive approach to obtaining data needed to assess hazard traits ---</p> <p>The current practice is for the state to consult various lists and data sources to try to track down whatever information is available to assess hazards of chemicals. The information available varies enormously, and little is available for many chemicals. The State needs to have the authority to obtain the</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>information and test results needed to assess and characterize the hazards of chemicals.</p> <p>C. Develop approaches to testing that are informative for assessment --- Testing requirements should be designed to produce consistent data to allow comparison between chemicals. Empirically verifiable test results should be converted into understandable characterizations efficiently and transparently.</p> <p>D. Incorporate scientific progress into approaches to assessment --- As noted by the National Academy of Sciences in its recent report on toxicity testing, gains in scientific knowledge and improvement of methods are significant. However, many major methods in use are based on the scientific understanding of twenty years ago. Methods are needed to reflect current understanding of issues including the importance of timing of exposure and how effects at different life stages can differ; differences in susceptibility including the particular susceptibility of children; the importance of multiple exposures to multiple chemicals; and the significance of biological perturbations in increasing likelihood of diseases or disorders. Cal EPA should engage experts to work toward incorporating current science into better methods for assessing the hazards of chemicals. These would likely include use of genomics and related technologies and other high through put approaches. It would also include systematic validation. Such efforts should be guided by the policy goal to adopt the best currently available methods. Investment in incorporating current knowledge into methods is needed.</p> <p>II. Provide clear and transparent characterization of chemical hazards to the public. Many entities can make decisions and take action that contribute to adoption of safer or lower hazard chemicals and products. Case studies presented to this initiative have shown actions by businesses to adopt greener practices and products. To support such efforts, businesses, agencies, and the public need comprehensive, current, accurate, and reliable information about the relative hazard of different chemicals. This would allow them to select lower hazard chemicals that meet operational needs. Such information would also be of value to the state in its management and regulatory responsibilities. The State of California should develop a matrix of information about the hazard traits of chemicals in use or considered for use, presented in ways that are useful and understandable to various audiences. This matrix should also make clear when gaps in data exist, so that businesses and individuals can choose to avoid chemicals with unknown hazards as well as those that are higher hazard. Such information is necessary to allow for the selection of safer or lower hazard alternatives.</p> <p>III. Design continued improvement into the system. Science produces new understanding all the time. Any system that is developed should be designed to apply current scientific knowledge to respond to the policy need for the best available methods and approaches. It should also be designed to incorporate new methods or approaches as they become available.</p> <p>IV. Ensure scientific integrity. To develop a scientifically-based program, it is important to ensure the integrity of the scientific information and expertise that are engaged. Several unfortunate instances of potentially tainted science and related deliberations have come to light in the last couple of years. The State should adopt the highest standards for ethical conduct and independence of the experts upon which it relies. Standards recently adopted at the International Agency for Research on Cancer for its review of potential carcinogens provide a useful model.</p> <p>V. Ensure public accountability. Good public policy is transparent to the people. This is particularly important for topics that have a high degree of technical content that can be difficult for people to access. The program should incorporate principles of public accountability by ensuring that all information is available to the public and that all proceedings are conducted in the public view. It will be important to ensure that hazard information is not hidden behind claims of confidential business information, and a high standard for review of such claims is needed.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
	<p>Thank you for your consideration of these comments and suggestions. Very truly yours, Amy D. Kyle</p>
F-GC-32	<p>GMA's Perspective on a Framework for Green Chemistry GMA's Perspective on a Framework for Green Chemistry The Grocery Manufacturers Association (GMA) represents the world's leading food, beverage and consumer products companies. The association promotes sound public policy, champions initiatives that increase productivity and growth and helps to protect the safety and security of consumer packaged goods through scientific excellence. The GMA board of directors is comprised of chief executive officers from the Association's member companies. The \$2.1 trillion consumer packaged goods industry employs 14 million workers and contributes over \$1 trillion in added value to the nation's economy.</p> <p>GMA appreciates the opportunity to participate in a dialogue on California's Green Chemistry Initiative with California's Environmental Protection Agency (CalEPA) and other interested parties. Our membership includes leading consumer products companies that produce safe consumer products that are protective of human health and the environment while improving the quality of life and protecting the public health against dangerous diseases, infestation, and unsanitary conditions.</p> <p>Green chemistry is sustainable innovation. It is built upon a foundation of companies using hazard and exposure analysis to address safety prior to marketing. It is about moving toward products with improved environmental quality that also improve performance and consumer value to better meet all consumer needs. It uses analytic tools such as life cycle assessment to guide real product improvement and to protect against burden shifting or regrettable substitution with unintended adverse consequences, such as occurred with MTBE.</p> <p>Background Our members are committed to thoroughly evaluating their products for human and environmental safety through rigorous safety-based assessments before they are marketed. Our members provide clear and meaningful labeling on consumer products to ensure that consumers use products in accordance with label instructions. Our members routinely apply green chemistry and green engineering principles in their operations and have been honored with awards for their efforts. The consumer products industry develops products that meet or exceed the safety requirements of all state and federal agencies in the United States and Canada charged with regulating those products, including the California Department of Pesticide Regulation, the California Air Resources Board, other state agencies, the U.S. Consumer Product Safety Commission, the U.S. Environmental Protection Agency, the</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>U.S. Occupational Safety and Health Administration, the U.S. Food and Drug Administration, Health Canada, and Environment Canada. GMA supports initiatives that continue to foster innovation and encourage universities, educational institutions, and industry to partner in developing effective “greener” ingredients that reduce environmental impact. We support company performed safety-based assessments of consumer products prior to the marketing of a product, considering all phases of the lifecycle of a product. Any chemicals management program must be based on sound scientific risk assessment to protect public health and the environment, and we support appropriate use-restrictions for chemical ingredients when those scientific safety-based assessments indicate they cannot be used safely in consumer product or use application. We support initiatives by companies, government and interested parties to promote consumer awareness of the importance of reading and following label instructions for safe product use, storage and disposal.</p> <p>We applaud collaborative efforts to encourage public and private partnerships, with a goal of developing greener products and environmentally responsible ingredients based on life cycle considerations, rather than mandatory and voluntary state labeling programs that endorse green products or programs that stipulate a single third-party certification of green products or numerical ranking. We encourage research that shows opportunities for the use of green chemistry in consumer products, as well as policies designed to overcome barriers to commercial application of green chemistry research and development efforts. We support initiatives that create incentives for innovative companies that develop greener products that are technologically and commercially feasible, and we encourage recognition for companies that develop sustainable business operations, processes and/or products.</p> <p>General Principles</p> <p>We believe that the Green Chemistry Initiative should ensure the safety of consumer products through the use of sound science in the decision-making process. It must foster innovation and encourage the development of new chemistry technologies. The Initiative should be designed to promote products that are technologically and commercially feasible to produce without compromising product efficacy, performance and usability. It should build on existing statutory and regulatory structures, voluntary initiatives and data development efforts. Finally, CalEPA should seek guidance from all stakeholder interests.</p> <p>Key Elements for the Green Chemistry Initiative</p> <p>We respectfully submit that the framework for the Green Chemistry Initiative should include the following elements:</p> <p>(1) A Systematic, Collaborative Process to Address Priority Chemicals:</p> <p>We support California’s initiative to move beyond a chemical-by-chemical approach and build a more systematic, scientific and collaborative process to address priority chemicals. As Governor Schwarzenegger recently stated:</p> <p>“I strongly believe there needs to be a systematic way to address these types of concerns where California’s scientists can work together with experts throughout the world to evaluate the health effects of chemicals, assess the risks they pose, and ensure that the safety of possible alternatives receives the same consideration.”</p> <p>It is eminently sensible for California’s collaborative effort to proceed in tandem with ongoing work by other government agencies assessing chemicals. The Canadian Government announced their Chemicals Management Plan on December 9, 2006. Numerous substances that have been in commerce for more than 20 years were assessed against rigorous scientific criteria. As a result of that process, Health and Environment Canada are now addressing priority chemicals as part of the Industry Challenge Program within the Chemicals Management Plan. Since Canada is undertaking this proactive approach for existing substances against the most modern science, we respectfully suggest that CalEPA collaborate with the Canadian government not only on the priority list of chemicals but the program in general. In our opinion, this collaboration would avoid needless duplication, inefficiencies and burdens, as well as take advantage of credible, high-quality scientific work already completed. This will help the government of California to meet its goals in a faster, more cost-effective way.</p> <p>Working with the Canadians and the Plan undoubtedly would foster greater results for the regulatory cooperation agreement for chemicals announced by the President and the leaders of Canada and Mexico this past summer. As part of the agreement signed in Montebello, the three countries agreed to</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>share data, information and safety assessments so that all North Americans would have continued access to safe and effective products with improved sustainability and environmental quality profiles. With California's expertise at the table, collaborating with the agencies involved could accelerate the benefits of this effort across the North American region.</p> <p>As indicated in Governor Schwarzenegger's comment, it is important that California proceed with a science-based approach that focuses on key information, including toxicity and exposure of chemicals and possible alternatives, so that sound safety decisions can be made in the context of scientific risk assessment. This process must be the tool for focusing resources and attention on a limited number of chemicals that are important to evaluate. The process should be collaborative and should include scientific experts in toxicity and exposure from academia, chemical manufacturers, product formulators, and nongovernmental organizations. The manufacturers of the chemicals and consumer products could provide toxicity and exposure/use data to determine whether the uses of "priority chemicals" are safe or should be restricted.</p> <p>(2) Ingredient Communication: Some consumers have expressed a desire to know what ingredients are in the products they use in their everyday life. These consumers are interested in having this knowledge in order to make informed product choices. We support providing accurate information to consumers through ingredient communication. Manufacturers of essentially every name-brand product have programs to respond to the information requests and needs of consumers. For example, we actively work with consumers who call our toll-free numbers or send emails. We are always looking for better ways to communicate. Some third party assessments and information available on the Internet or through literature searches can be inaccurate due to the reliance on sources or on assumptions that may not be as current as the information provided by the manufacturers or industry groups representing the products. Industry has the obligation and continues to improve the methods it uses to communicate product information to consumers, especially in its efforts to ensure the safe and appropriate use of the products. We would like to work with California to implement a means of ingredient communication that would provide consumers with the information they can use to make even better informed decisions regarding the products they use in their homes.</p> <p>(3) Product Safety Assessments: Our members are committed to thoroughly evaluating their products for human and environmental safety through rigorous safety-based assessments before they are marketed. We support the continual improvement of safety assessments and methodologies including conducting life cycle assessments to help understand the health and environmental footprint of products and possible alternatives through their lifecycle. Our members have staff that includes experts in toxicology and environmental science to work on these assessments. CalEPA could work with scientific experts to examine best practices and to develop a toolkit for safety assessment programs and for safety assessments. Companies also could make a description of their safety assessment process available on the Internet. This could help provide context for product ingredient communication. In addition to product safety assessments, companies could adopt programs to ensure the safety of raw materials and packaging, operations, storage and distribution, and the use and disposal of products.</p> <p>(4) Supporting Innovation: The Green Chemistry report argues that there is a need to close the "technology gap" through market-based incentives to support green chemistry. This could include funding for university research grants, scholarships, and similar programs, as well as awards for innovation, tax credits, low-interest loans, and other incentives. These positive incentives should be open to all companies that are innovators and sell products in California -- not simply be limited to companies located in California.</p> <p>* * * * *</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>Chemicals are useful and essential ingredients for many products that protect public health and improve the quality of our lives. We appreciate the importance of a scientific approach based on an evaluation of hazard and exposure information to determine the safety of these products that improve the well-being of the public.</p>
F-GC-33	<p>Taking A Step Back Taking A Step Back</p> <p>Before embarking on an initiative, it would be well to consider whether there is an underlying problem that needs to be addressed. With respect to chemical policy, the question might not be so much: What can California do to stimulate a green chemistry transformation in the design of products and processes? The question may well be: Is there a problem with the current usage patterns of chemicals in California to begin with?</p> <p>Consider, for example, that life expectancy has been increasing for over a century. Public health has dramatically improved since World War II. This improvement has occurred during the very time period when chemical usage expanded dramatically. As Gregg Easterbrook has observed, "it cannot be true that Americans are being poisoned and growing healthier simultaneously." Releases of hazardous substances to the environment peaked in the 1960s and 1970s, and trends have been downward following reforms in the pesticide and hazardous waste laws. Again paraphrasing Gregg Easterbrook: If the "poisoning of America" was ever going to occur, it would have occurred in the 1960s and 1970s. The high point of risk from chemical exposure passed 25 years ago.</p> <p>Consider also the most recent Annual Report to the Nation on the Status of Cancer, published by the Centers for Disease Control in October 2007. The Report concludes that overall cancer death rates decreased by 2.1% per year from 2002 through 2004, nearly twice the decrease of 1.1% per year from 1993 to 2002. Total cancer incidence rates have also been declining since 1992.</p> <p>It is true that there are more cancer deaths now in the US than there were fifty years ago. But the population is much larger now and people are living longer. Cancer prevalence increases steadily with age, as it always has. Adjusted for population size and age, cancer mortality in the US was essentially unchanged over the last 50 years of the 20th Century. When cancers attributable to smoking are taken out of the equation, cancer mortality has actually been in decline for 50+ years. It is this decline in cancer mortality, combined with medical advances on other diseases, that has resulted in the increase in life expectancies in the US over the past century.</p> <p>There may be a popular perception that chemical exposures are responsible for many, if not most, cancers. In reality, however, this is not the case. Large epidemiological studies show that it is unlikely that environmental factors account for much more than 2% of all cancers. There may also be a popular perception that humans are now, for the first time, being exposed to innumerable chemicals throughout their lifetimes. In reality, humans have always been exposed to chemicals, whether from the soot and combustion products from wood-burning stoves and campfires or from foods. All plants contain some level of toxins, which is an important evolutionary survival mechanism for plants. Over 99% of the pesticides we consume are naturally occurring. We do not know how dangerous or benign these natural pesticides may be because so few of them have been tested. What studies have been done suggest that naturally occurring pesticides are toxic to essentially the same extent as manufactured pesticides.</p> <p>In the late 1600s, women were hanged as witches following trials at which experts opined that their behavior patterns were causally related to witchcraft. In the early 1900s, 60,000 people were forcibly sterilized based on the opinions of eugenics experts as to who was the potential parent of socially</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>inadequate offspring. In the late 1900s, Bendectin was driven from the market by a litigation frenzy despite the fact that no scientific studies showed that it caused birth defects and no liability verdicts were ever upheld on appeal. Human nature sometimes allows popular perceptions to displace the truth. Some may believe that the expert speculations of today are the scientific truths of tomorrow. However, history teaches that expert speculations often have nothing to do with the truth and policy based upon them can have unjust consequences. Humans are at their best when they make decisions founded upon sound evidence and we would do well to insist upon rigorous proof before we begin to remove useful products from the marketplace.</p> <p>Public policymaking in the area of chemical safety regulation has an uneven track record. Every effort to quantify risks and prioritize problems has shown that much more societal benefit could be achieved by focusing more resources on general public health issues, such as increased pre-natal care for the economically disadvantaged, increased regulatory pressure on smoking, and outreach to increase the rate of organ donation. Numerous commentators have shown that if the goal is general social well being, increased attention to prevention of exposure to toxins in the environment is difficult to justify based on current scientific knowledge. Justice Stephen Breyer observed over a decade ago that a "vicious cycle" of risk misperception among the public and policymakers has led to over-regulation in this area.</p> <p>Numerous regulatory programs are already in place. The federal pesticide statute and pesticide registration regulations have dramatically reduced exposure to "hard" pesticides. State and federal hazardous waste regulations have dramatically reduced uncontrolled disposal of hazardous wastes. The federal Superfund law and similar state laws have created enormous economic disincentives to the careless disposal of hazardous substances. The Toxic Release Inventory has created pressure on users of chemicals to decrease their usage. Private and public research has identified many safer alternatives to current chemical uses and more research will undoubtedly yield further results.</p> <p>When public health issues arise due to exposure to toxic substances, the impacts are generally not obscure and the policy response generally makes common sense. When it became clear that asbestos caused mesothelioma, asbestos insulation was banned in most applications. When the impacts of lead exposure on children came into focus, lead was removed from gasoline and from paints. When the full impacts of smoking started to become clear, numerous actions including restrictions and taxes were imposed. These types of actions had a direct, measurable impact on public health. The Department should carefully consider whether proposals forwarded to it in connection with this Initiative will have similar impacts.</p>
F-GC-34	<p>Senior Health Scientist, ChemRisk Inc. November 16, 2007</p> <p>Ms. Maureen Gorsen, Director Department of Toxic Substances Control P.O. Box 806 Sacramento, CA 95812-0806 Re: "California Green Chemistry Initiative" Comments Dear Director Gorsen:</p> <p>As a Senior Health Scientist at ChemRisk® I am pleased to submit the following general recommendations to the Department of Toxic Substances Control for the "California Green Chemistry Initiative." ChemRisk® is a consulting firm providing state-of-the-art toxicology, industrial hygiene, epidemiology, and risk assessment services to organizations confronting public health, occupational health, and environmental challenges. I am interested in providing these comments to fellow practitioners and stakeholders involved with this Initiative who recognize the importance of: (1) ensuring the integrity of "Green Chemistry's" science; and (2) applying robust risk assessment techniques to the Initiative's chemicals policy.</p> <p>There is indeed great promise in "Green Chemistry" to maintain scientific integrity in its approach to investigating and communicating the potential benefits, risks, uncertainties, and tradeoffs of using both traditional chemicals and their replacements. To that end, Green Chemistry's presentation of</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>hazard and risk information for human or environmental health should not only be relevant to real-world situations, but also be transparent, comprehensive, risk-based, and ultimately understandable so that its significance, uncertainty and variability are easily identifiable. The significance of environmental monitoring and biomonitoring data should also be put in a context relative to potential health risk.</p> <p>As the State of California moves forward with their “Green Chemistry Initiative”, I would like to recommend that they consider applying a balanced approach that considers the many factors involved with each product’s science, technology, performance, and environmental health and safety profiles. Specifically, I recommend the use a balanced view of “Green Chemistry” that takes into account not only sustainability factors (e.g., societal, economic, and environmental) but also equally considers risk, benefits, and tradeoffs that are grounded in solid science. Additionally, the information base supporting “Green Chemistry” should be objective, peer-reviewed, accurate, and complete. To achieve such a base, I recommend reviewing the best available state of the science, giving due consideration to statistical and biological significance, and weighing supporting evidence.</p> <p>Evaluations of alternative or substitute chemicals should not abandon risk concepts such as real versus perceived risk, association versus causation, and potential for unintended consequences. Evaluation of costs and benefits, performance, and other tradeoffs also should not be ignored. No readily available “drop-in” replacement chemical typically exists, and even when substituting one chemical for another, differences in compatibility and performance must be taken into consideration. As such, analysis of the potential tradeoffs of proposed alternatives and substitutes should include the following considerations:</p> <ul style="list-style-type: none"> costs/benefits§ relative risk§ impact on§ physical/mechanical/aesthetic properties of product or component level of§ performance (i.e., equivalent or better) efficiency (i.e., higher or lower§ loading/concentrations to impart same level of performance and function) § safety (e.g., flammability) levels of testing and knowledge (i.e.,§ physical-chemical and toxicological testing, occupational, human and environmental health) levels of exposure and release potential (e.g., via§ leaching or volatilization) timing needed to validate into product§ development process potential to restrict trade or prevent innovation, and§ product stewardship and life cycle factors (e.g., end of life recycling).§ <p>Such a tradeoff analysis is critical to not only prevent replacing one risk for a larger and possibly unintended one, but also to prevent discriminating against chemicals without any scientific justification that a substitute is “better” or “safer” than the original.</p> <p>I would stress that even “greener” chemicals differ from each other significantly in their physical and chemical properties and in multiple ways that can influence their hazard and risk. Each chemical should therefore be evaluated specifically on its own merits based on its unique structural, physical, chemical, and toxicological properties. Risk from chemicals is a function of the chemical’s inherent toxicity potential (based on structural, physical, chemical properties), exposure (i.e., dose, route, duration, life stage), and use patterns and interaction with potential receptors. California “Green Chemistry Initiative” should therefore balance the risks posed by these separate factors in order to determine whether the green chemical is really a “better” substitute. The Royal Society of Chemistry provides an illustrative table as a qualitative example of such balancing of a couple of different example endpoints (toxicity, ecotoxicity, and volatility), a task which can take place prior to the step of risk analysis (http://www.rsc.org/ScienceAndTechnology/Policy/EHSC/ChemicalSub.asp).</p> <p>Thank you for the opportunity to share some general recommendations as you work toward finalizing the “California Green Chemistry Initiative.” Please do not hesitate to let me know if you have any questions.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>Sincerely, Len Sweet, PhD, MPH, MSc Senior Health Scientist ChemRisk, Inc.</p>
F-GC-35	<p>Manager, Corporate Communications Dear Secretary Adams: The California Environmental Protection Agency's Green Chemistry Initiative outlines many of the same goals as the American Chemistry Council's Responsible Care® Management System (RCMS). "A Responsible Care management system offers an integrated, structured approach to drive results in seven key areas: community awareness and emergency response; security; distribution; employee health and safety; pollution prevention; process safety; and product stewardship." This system requires companies to measure and publicly report performance. It requires that companies take responsibility that their employees, products, facilities, transportation, etc., are safe and secure. It requires that companies take responsibility for their products from "cradle to grave" and it requires third party verification that all of these processes have been completed. The RCMS framework is designed as a system of continuous improvement. The RCMS framework should be applied on a global basis, and we suggest that California should also embrace these goals. Rather than legislating additional rules and regulations, Carus Corporation encourages the state to support the green initiative by looking at their current industrial facilities and chemical use and support the companies that are committed to and can demonstrate that they are working towards, or have achieved, these goals. If California were to alter their purchasing practice and not fall victim to the "cost-based processes" (pollution-based model), it would have a huge impact on the way other manufacturers do business in the state. The surest way for California to make a difference is to lead by example and provide tax incentives, state contracts, and other incentives to the companies that are currently practicing "sustainable manufacturing processes" (green chemistry) using the RCMS framework. Carus Corporation has a strong belief that in order to be a sustainable company, our manufacturing processes must be environmentally friendly and cause minimal impact to the environment. One way to compare a "sustainable manufacturing process" to a "cost-based process" is to look at the amount of greenhouse gases (CO₂) produced during the manufacture of permanganate, our core product. Carus Corporation uses a totally enclosed, extremely efficient, process that produces very high yields while generating about four tons of CO₂ (greenhouse gas) per ton of permanganate produced. A "cost-based process," such as the processes used to produce permanganate in China, generates significantly more CO₂. In fact, it is estimated that the Chinese permanganate production produces 60 tons of CO₂ (15 times more than the Carus process) for every ton of permanganate produced. These</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>inefficient processes contribute TWO MILLION additional tons of CO2 more than necessary, and the environmental impact cost is deferred to future generations.</p> <p>Having a “sustainable manufacturing process” also requires a company to spend more to make their product than just the cost of raw materials, production, labor, and logistics. Additional costs incurred by companies using green chemistry include constant monitoring to determine environmental impact, worker and plant safety, worker health, and consumer health, safety, and environmental issues. “Cost-based processes” defer these costs to future generations because they have placed very little value on their resources. There is no doubt that these sites will ultimately have to be cleaned up and these costs bore by future generations.</p> <p>Carus Corporation is a chemical manufacturer located in LaSalle, Illinois, a rural area in north central Illinois. The company was founded in 1915 and is still owned and operated by the Carus family. We have about 220 employees and are one of the larger employers in the area. Carus’ core products include permanganates, manganese catalysts, and phosphates. These products are all primarily used to protect human health and the environment by improving the quality of drinking water, treating wastewater, cleaning up contaminated soil and groundwater, as well as preventing air pollution.</p> <p>Carus has been a member of the American Chemistry Council for more than 60 years. We have maintained this long-term relationship because we believe in and subscribe to the same principles, i.e., to protect public health and the environment while producing chemicals that will have a positive and beneficial effect on the lives of the people who use them. We are an active participant in the American Chemistry Council’s Responsible Care® initiative to continuously improve our health, safety, security, and environmental performance. In fact, Carus’ Vision Statement is “No Accidents, No Injuries, No Harm to the Environment.” Because of our role in the community and the surrounding farming area, protecting the environment and contributing to the betterment of our community are key priorities for the company.</p> <p>Our commitment to the betterment of the community is demonstrated in many of the policies and benefits our company provides. Carus has a volunteerism policy that encourages our employees to get involved. We provide every employee eight hours of paid time off each year to donate his or her time and talent to educational and other beneficial causes. In addition, Carus has many company-sponsored events, and our employees routinely provide hundreds of hours of volunteer time to schools, fire departments, community events such as Labor of Love, Junior Achievement, to name just a few.</p> <p>Carus is an education advocate, and we expend significant resources to educate children, teachers, and the public about the chemical industry and our responsibility as a chemical manufacturer. Some of the educational programs Carus offers include:</p> <ul style="list-style-type: none"> - Career Days at the Chicago Museum of Science and Industry in conjunction with the Chemical Industry Council of Illinois (CICI) - Summer Science Camp for Kids, a chemistry camp for junior high students in the area - “You Be the Chemist” Challenge in conjunction with the Chemical Education Foundation - National Chemistry Week demonstrations to area schools - Teacher Enrichment Workshops with CICI - “Work in the Real World” Career Night with North Central Illinois Works - “Scientific Work Experience for Teachers,” a summer employment program that gives science and math teachers an opportunity to work in a chemical manufacturing facility. They learn how the concepts they teach are applied in the real world, which in turn, benefits the students. - Tuition reimbursement for employees and their children <p>Most of our employees live, work, and play in this community. Our goals as a Responsible Care® company are to have a positive impact on the community, both environmentally and socially. Our environmental footprint needs to be small, and that can only be achieved by a constant commitment to a “sustainable manufacturing process.”</p> <p>California has an opportunity to send a message to facilities already manufacturing in the state, to new businesses that want to locate there, and to companies importing their products into the state. The message is simple. Purchase only from companies that follow a Responsible Care® Management</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>System. Fairly and adequately enforce the rules already on the books. Provide quantifiable incentives to companies to practice “sustainable manufacturing processes.” Brenda K. Veronda Manager, Corporate Communications Carus Corporation (815) 224-6682</p>
F-GC-36	<p>Ecolab, Inc. Comments Regarding California's Green Chemistry Initiative California Green Chemistry Initiative</p> <p>Ecolab, Inc. is pleased to offer input regarding the development of California’s Green Chemistry Initiative. Ecolab Inc. is the leading developer and marketer of premium cleaning, sanitizing, pest elimination, maintenance and repair products and services for the world’s hospitality, food service, health care and industrial markets. We are committed to providing the most effective and efficient cleaning, food safety and infection control programs available. Sustainability is inherent in our products and services. From concentrated, solid formulations to innovative packaging and dispensing methods, our products are designed to help increase safety, lower the use of water and energy, and reduce the chemicals and waste released to the environment. Strengthened by the expertise of our associates and combined with our dedication to social responsibility, these offerings provide value to our customers and the global economy – and help foster a more sustainable world.</p> <p>Company Certification: The following components encompass suggested conditions for an organization to obtain a ‘green certification’ as a company from the State of California. These prerequisites would ensure the products produced by a green certified company would meet safety and environmental standards. This process would also serve a dual purpose. A certified company would agree to act in a responsible and environmentally friendly manner in the creation and utilization of its products and the regulatory review process would be thorough yet manageable for a certified company to operate effectively and efficiently.</p> <p>Condition #1: ISO 14001 Certification - Environmental Management Systems The International Organization for Standardization (ISO) 14001 environmental management system is a voluntary system for managing environmental aspects of business operations, somewhat similar to the ISO 9001 quality system. This sought-after designation includes guidelines for how organizations work to prevent pollution, conform to legal requirements, minimize impact on the environment and continuously improve environmental performance. In Europe, Ecolab maintains ISO 14001 environmental management certification for 12 operational units (11 production sites and our European headquarters in Düsseldorf, Germany). Ecolab is in the process of developing a global implementation program for ISO 14001 environmental management systems. This will result in ISO 14001 certification of our North American facilities in the near future.</p> <p>Condition #2: Access to established and centralized ingredient database To comply with the spirit of the California Green Chemistry Initiative, it is absolutely necessary that formulators use standardized ingredient properties and criteria. At this time, one of the most difficult aspects of Green Formulation is access to, and the variability of, data describing the potential hazards of</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>chemical ingredients. The ingredient database would characterize the human health, environmental, safety, and regulatory aspects of ingredients used in formulated products.</p> <p>Key to the database is that all relevant scientifically sound properties are included, while non-sound or controversial properties are excluded.</p> <p>A centralized database would provide the following advantages.</p> <ul style="list-style-type: none"> • Enable companies to make sound decisions based on good science. • Enable compliance with all applicable laws and regulations. • “Level the playing field” between companies. All would be using the same set of data. • Scientifically unsound data would be excluded from the decision making process. • Enable companies to move faster to provide environmentally compatible product offerings. • Enable companies to rank the environmental compatibility of each formulation. <p>Ecolab urges the State of California to fund development of the ingredient database. Without such a centralized database, it will be impossible for the Green Chemistry Initiative to succeed.</p> <p>There have been proposals that chemical manufacturers must provide certain environmental health and safety data on their MSDSs and labels. Implementing these Green Chemistry Principles will require significant toxicology resource commitments by chemical producers and formulators. The challenge for companies will be the inevitable disharmony of classification resulting from a lack of pre-defined criteria for the interpretation and evaluation of toxicology data for regulatory purposes. While there may be disagreement on how a database may be utilized, it is evident that most interested parties desire solid data from which to base future decisions upon.</p> <p>Chemical manufacturers will be responsible for gathering and evaluating relevant data on chemicals and mixtures they produce. Dependence on high quality and consistent data is critical to the success of this program. The challenge for California and companies will be:</p> <ul style="list-style-type: none"> • The available toxicology data vary in quality and consistency. • There is no rating system recommended for evaluating the quality of the toxicology data. • The knowledge of individuals conducting hazard classifications will vary widely. <p>The California Proposition 65 list of chemicals known to cause cancer or reproductive toxicity is an example of a program with pre-defined criteria for identifying carcinogens and reproductive toxins. There is no equivalent peer-reviewed program for evaluating data for acute toxicity endpoints (oral and inhalation LD50s, environmental LC50s), ecosystem health (endocrine disruption, biodegradation, bioaccumulation), allergic sensitization, and chronic toxicity endpoints such as neurotoxicity and organ toxicity.</p> <p>The GHS discussion distributed by the Society of Toxicology is relevant to an evaluation of data that would be required to comply with Green Chemistry Principles. Again, the development of a centralized ingredient database is crucial to the success of the California Green Chemistry Initiative.</p> <p>Condition #3: Established Regulatory Review Process</p> <p>Ecolab's extensive regulatory review processes and procedures demonstrate the already thorough and comprehensive methods we undertake to ensure our ingredients and products meet all regulatory and product stewardship requirements necessary before entering the commercial market (Regulatory flow charts and procedural documents are available for review).</p> <p>Ecolab Packaging Perspective</p> <p>Ecolab Package Engineering leads the development and efficient implementation of innovative and cost effective packaging solutions that protect Ecolab</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>products, the environment and our customers throughout the life cycle of the package. We are responsible for the efficient and effective delivery of our chemistries to our customers. Our engineering challenge is to ensure that our products are packaged efficiently to meet our economic, environmental and social goals, so that they may be transported safely, and used as they are intended.</p> <p>We start with a thorough understanding of our manufacturing capabilities and of our distribution environments. We also build our package designs around our customer needs and wants. Our overriding requirements when designing any package are:</p> <ol style="list-style-type: none"> 1. The package must meet and exceed all of our regulatory requirements. 2. The package must contain the least amount of material that is possible. 3. The package must contain the highest percentage of recycled content that is technically and economically feasible. 4. The package must be re-usable wherever possible. 5. The package must be robust enough to survive global supply chain environments. <p>Our regulatory obligations are at the forefront of our thought processes throughout the development of a new package design. We comply with all international, federal and state regulations as appropriate. This includes regulations developed by:</p> <ol style="list-style-type: none"> 1. US Department of Transportation 2. Transport Canada 3. US Food and Drug Administration 4. Health Canada 5. US Environmental Protection Agency 6. US Drug Enforcement Agency 7. UN Animal and Plant Health Inspection Service 8. International Maritime Organization 9. International Civil Aviation Organization 10. California Integrated Waste Management Board 11. Oregon Department of Environmental Quality 12. Coalition of Northeast Governors <p>Many of these regulations are performance based, so we typically subject packages to extensive testing protocols before we ever fill them with any product. These protocols simulate some of the hazards seen in our distribution environment such as drops, vibration and compression.</p> <p>Over and above this regulatory testing, we subject our package designs to batteries of tests design to ensure that requirements 2-5 listed above are met. Those tests include industry accepted standards from:</p> <ol style="list-style-type: none"> 1. American Society of Testing and Materials International (ASTM) 2. International Safe Transit Association (ISTA) 3. National Motor Freight Classification (NMFC) 4. International Standards Organization (ISO) <p>In closing, please accept these suggestions as an effort to create a positive working relationship between the State of California, its residents and industry. Ecolab is keenly aware of the importance of serving our customers in the most responsible manner and operating with environmental sustainability as an ever-present goal.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-37	<p>ExxonMobil Chemical's Thoughts on California's Green Chemistry Initiative</p> <p>ExxonMobil Chemical is one of the world's leading petrochemical companies with the responsibility to produce chemicals that the world needs in an economically, environmentally and socially responsible manner. We recognize the need to balance economic growth, social development, and environmental concerns in how we operate our business and promote our products.</p> <p>ExxonMobil Chemical is encouraged by DTSC's efforts to get a broad range of feedback on the Green Chemistry Initiative, and we look forward to working with the department as this initiative develops.</p> <p>ExxonMobil Chemical is committed to using a science-based approach in manufacturing. We subscribe to a life-cycle approach of our products as outlined in ISO 14000 and its guidance on reducing the impact of products and processes on the environment.</p> <p>ExxonMobil Chemical contributes to environmental solutions within its own operations through energy efficiency, reduction of emissions, and minimizing our footprint. Through disciplined molecule management, we continually strive to bring to society the highest value disposition of every molecule we process.</p> <p>Through implementation of our Global Energy Management System (GEMS), ExxonMobil is focused on improving energy efficiency. This program utilizes a common methodology and is comprised of a comprehensive and rigorous set of energy-saving practices that are applied across our global manufacturing operations. Energy efficiencies introduced through GEMS are already preventing greenhouse gas emissions of about 8 million metric tons each year, which is roughly equivalent to removing about 1.5 million cars from U.S. roads. Additionally, ExxonMobil is a leader in cogeneration technology and have cogeneration facilities worldwide with a combined capacity of 4300 MW of power (enough to power approximately 2.8 million US homes), reducing global CO emissions by 10.5 million metric tons annually, which is equivalent to removing another two million cars from US roads. Our long-standing commitment to energy efficiency reduces emissions while reducing our costs --- a clear win-win.</p> <p>One of our core priorities is product stewardship. We use science to understand the potential risks associated with the products we sell, we work to reduce those risks, and we communicate those risks to our customers and society at large. We are committed to product stewardship and making health, safety, and environmental protection an integral part of the development, manufacture, handling, use, and recycling of chemical products. In support of our efforts to thoroughly understand the health and environmental risks of our products, ExxonMobil employs a staff of more than 100 full-time scientists to perform rigorous toxicology and environmental impact studies. In fact, over the last 10 years, ExxonMobil has proactively invested nearly \$100 million on safety testing and evaluations to ensure that our products are safe for their intended uses.</p> <p>Our technology efforts focus on advanced processes and products. In the area of product technology, efforts are focused on developing new products whose characteristics are environmentally preferred. These products span many chemical families and end uses. Examples include technologies that enable lighter but stronger plastics, longer-life and improved air retention tires and lower toxicity/lower reactivity fluids. Our technological advances continue to allow us to bring higher valued products to market in an effort to continue to make our way of life possible.</p> <p>In the process of developing the Green Chemistry Initiative, we would encourage DTSC to consider what the industry is already doing to provide high value products with the least environmental impact and to use a risk-based science approach.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-38	<p>First Steps in Green Chemistry The First Step to Green Chemistry: A Model Program Institute for Research and Technical Assistance (IRTA)</p> <p>Introduction and Background DTSC has been charged with developing a new approach to viewing and handling chemicals and products that pose health and environmental problems. The agency has been developing a Green Chemistry initiative which would focus on chemicals and products using a cradle to cradle rather than an end of pipe regime. DTSC is the obvious agency to develop this innovative approach because of the agency's focus on pollution prevention which encompasses Green Chemistry concepts. DTSC is seeking input from all stakeholders to design the Green Chemistry approach that will ultimately be adopted. Much of the discussion to date has focused on the chemicals industry. The chemicals industry has made their position clear: they would like DTSC to adopt a voluntary program that will build on measures the industry has already taken. Many of the ideas for the program proposed by stakeholders are vague and, indeed, it is a difficult task to formulate a comprehensive policy that would apply to all chemicals that pose health and environmental threats. Because developing a comprehensive Green Chemistry approach is complex, confusing and overwhelming, DTSC should start by conducting a scoping study that would focus on very specific issues and outcomes. This specific study could serve as a model for the overall comprehensive program design.</p> <p>Overall Concept We are all familiar with the notion that chemicals enter the market without toxicity or environmental testing. They are used widely in some cases and later, during their use, health and environmental problems emerge. At times some of these chemicals are regulated by California agencies for various reasons and other chemicals or products are used in their place. There is little information on the new chemical and product substitutes and, because they are unregulated, they are used in an uncontrolled manner. Problems with the substitutes arise and still other chemicals and products are introduced to replace them. The pattern continues and there is never any systematic attempt to deal with the issue comprehensively. When the agencies try to regulate the chemicals or products, industry argues that there are no alternatives. This is a major issue because the industry itself will not focus on or develop alternatives unless there is a regulation. This results in a "chicken and egg" problem and the chemicals and products that pose problems continue to be used, exposing workers, people in the surrounding communities and consumers.</p> <p>The U.S. has relied on TSCA to prevent toxic chemicals from entering the market. Rarely, if ever, are manufacturers asked to conduct toxicity testing before their introduction. The EU has started developing the REACH program that will eventually require manufacturers to conduct toxicity testing of certain priority chemicals. DTSC can establish a program that will eventually use the results of the toxicity testing under REACH. As a first step, IRTA suggests that DTSC sponsor a project that focuses on a candidate set of chemicals that poses health and environmental problems to establish a model before adopting a complex and political comprehensive program.</p> <p>An important feature of this model program should be the work on alternatives. The current suppliers of chemicals or products to a particular industry have no incentive to develop alternatives without a regulation. The manufacturers of the chemicals are not always familiar with how their chemicals are used; they sell the chemicals through distributors and product manufacturers who, in turn, sell to other distributors or formulators and finally, to the users. Regulatory agencies are caught in a bind since they rarely understand the industries they regulate in depth and know little about what possible substitutes there might be. It is important to use or establish independent entities with detailed technical knowledge and experience, to find, develop, test and demonstrate viable and cost effective alternatives. The industries using the candidate chemicals or products must work with the independent entities to test potential alternatives. The health and environmental characteristics of the potential alternatives must be investigated and the alternatives must be safer than the original chemicals and products they will replace.</p> <p>The Institute for Research and Technical Assistance (IRTA) is a nonprofit organization established in 1989 to identify, develop, test and demonstrate safer</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>alternatives in a variety of applications. IRTA's particular focus has been solvents used in a variety of applications including cleaning, dry cleaning, paint stripping, thinning, coatings, adhesives and lubricants. IRTA has successfully worked on a number of government sponsored projects over the last several years to find, develop and demonstrate effective safer alternatives. Agencies have passed a number of regulations as a result of IRTA's work. IRTA is a very small organization that is a model for the independent entities that need to be established to conduct work on alternatives for the Green Chemistry initiative.</p> <p>An example that illustrates the complexity of eliminating unsafe chemicals from products is automotive aerosol cleaning products. Chlorinated solvents, notably 1,1,1-trichloroethane (TCA), was used extensively in these products. TCA production was banned in 1996 as part of the Montreal Protocol because it contributes to stratospheric ozone depletion. It was replaced with perchloroethylene (PERC), a carcinogen, a Hazardous Air Pollutant (HAP), a Toxic Air Contaminant (TAC) and a listed RCRA waste. PERC was used for many years in automotive aerosol cleaners until CARB banned chlorinated solvent use in these products. At that stage, the industry began formulating cleaners with hexane which causes peripheral neuropathy. IRTA successfully conducted a project to identify, develop and test safer alternatives. Based on IRTA's project results, CARB adopted a regulation last November to set a very low VOC content limit of 10% in these products by 2010. This action will reduce VOC emissions from the products by 10 tons per day. Because chemicals like hexane and various other toxic solvents are classified as VOCs, the alternatives used after 2010 should be much lower in toxicity than the current and historically used cleaners. Because the regulatory process is cumbersome, the substantial reduction in hazardous materials used in automotive aerosol cleaners will have required more than 14 years to achieve.</p> <p>Another example is repair and maintenance cleaners used in auto repair and industrial facilities. In 1997, IRTA completed a project sponsored by EPA to identify, develop, test and demonstrate water-based cleaners for repair and maintenance cleaning. Based on IRTA's work, SCAQMD passed a regulation that became effective on January 1, 1999 that established a low VOC content for these cleaners. Most companies converted to water-based cleaners and the regulation resulted in a reduction of VOC emissions of 18 tons per day. Because the regulation restricts the VOC content of the alternative cleaners, a number of companies are using an alternative, called D5, that is exempt from VOC regulations. D5 has caused cancer in laboratory animals yet it is not regulated by Cal/OSHA or any other agency and can be used in an uncontrolled manner. D5 is marketed under the tradename Green Earth in the dry cleaning industry where hundreds of dry cleaners in California have adopted it as a "safer" alternative to PERC.</p> <p>These examples, and there are many others, demonstrate that there is no comprehensive method of eliminating chemicals that pose health and environmental problems. Some dangerous chemicals can be eliminated if alternatives are developed and proven but it takes many years under the current regulatory regime and they are often replaced by other chemicals that also pose a problem but in a different way. There are also huge roadblocks to eliminating new chemicals, like D5, from use because they are not on any regulatory lists. It is very time consuming and, in some instances, impossible, to get new chemicals placed on these lists. Indeed, the air regulatory agencies often encourage and promote the use of these alternatives because they are exempt from VOC regulations.</p> <p>Specific Scoping Project</p> <p>The project IRTA is proposing would involve: selecting a chemical class; evaluating the health and environmental information on the chemicals to determine whether it is adequate as a basis for eliminating the chemicals; identifying, developing and demonstrating safer alternatives with the industries and in the applications where the chemicals are used; analyzing the performance, cost and cross-media implications of using the alternatives; and describing a plan for phasing the chemicals out. It would also include an assessment of the industries and applications where the chemicals are used and an evaluation of the health and environmental effects of the potential and safer alternatives. This project would serve as a model or a template for DTSC for future policies and actions under the Green Chemistry initiative.</p> <p>A good candidate chemical class for the project is chlorinated solvents. These materials are ozone depleters, global warming chemicals, carcinogens and some are listed on Proposition 65, the HAP list, the TAC list and are listed hazardous wastes. Some of the chlorinated solvents are major contaminants of</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>soil and groundwater. There is general agreement that this class of chemical is dangerous. Although these solvents have been phased out in some applications and future phaseouts are already planned, there are still applications where they are used. Some of the chlorinated solvent alternatives are other solvents that also pose health and environmental problems. A model project could take this into account and look at the alternatives and potential alternatives in all of the chlorinated solvent applications as well as the chlorinated solvents themselves.</p> <p>The chlorinated solvents either have been or still are used in a variety of applications including vapor degreasing, cold cleaning, automotive aerosol cleaning, handwipe cleaning, dry cleaning, paint stripping, maskants, spotting chemicals, coatings, reaction mediums, and laboratory uses. In some cases, like dry cleaning for instance where PERC is the major dry cleaning solvent, there are future phaseout dates that have been established by the state. Some of the alternatives, including D5 described above, have problems as well. In other applications, the laboratory and chemical production uses, the chlorinated solvents are still used fairly extensively and no alternatives are currently available or even envisioned.</p> <p>The proposed scoping project would focus in on chlorinated solvents. It would examine the history of use of the solvents and determine the alternatives that have been used to replace them. The project would evaluate the toxicity information for the chlorinated solvents to assess whether it is sufficient to call for a phaseout of the class of chemicals. It would also involve examining the toxicity and environmental impact information for the alternatives that have replaced the chlorinated solvents as they have been increasingly regulated. The project team would investigate the remaining uses of the solvents and determine what the alternatives are. In some cases, no alternatives have been identified and the project team would identify, develop, test and demonstrate alternatives with the industries still using them. The alternatives found for the remaining applications would be evaluated for their health and environmental characteristics, their performance and their cost.</p> <p>The results of the project would lay out an approach and methodology for phasing out use of the chlorinated solvents altogether. It would also describe the best methods for ensuring the alternatives that are adopted are safer. This same approach would be a template for considering and phasing out other chemical classes. It would establish a model for DTSC to adopt for the Green Chemistry initiative.</p> <p>The advantage of this approach--selecting a chemical class and working through it to find a methodology for dealing with problem chemicals and products--is that it is specific. There are so many chemicals and classes of chemicals that require attention that the approach to establishing a Green Chemistry is daunting. Working though this specific case will highlight decision points and complexities that will arise in a larger program with a broader focus under the Green Chemistry initiative.</p>
F-GC-39	<p>Educating the Chemists of Tomorrow: The Current State of Green Chemistry in Academia (POSTED 3X)</p> <p>As a chemist pursuing a PhD at UC Berkeley, I am particularly interested and excited by the current discussion of Green Chemistry going on in the California Legislature. Although I have heard the phrase "green chemistry" more frequently at academic talks recently, I am not convinced that the chemists on the ground have a clear picture of what green chemistry research looks like. The 12 principles put forth by Paul Anastas and John Warner are good guiding principles to evaluate chemical processes, and I would like to review what I perceive as the current status of these ideas within the context of a chemistry education.</p> <p>The principles that I do see being put into practice throughout the academic training of chemists are: Atom Economy, Reduce Derivatives, Catalysis, and Inherently Safer Chemistry for Accident Prevention. These principles are taught in undergraduate courses and practiced and discussed in undergraduate laboratories, preparing students who continue their education to practice these principles of synthetic design and chemical safety in their own research positions. I have seen a few other examples of these principles gaining traction at the graduate research level including: Less Hazardous Chemical Syntheses and Safer Solvents and Auxiliaries which are both motivated by chemists desire to reduce health and safety risks in the lab and also labs increasingly taking into account the design of synthetic methods for Energy Efficiency. I know of a limited number of labs around the country working on promoting the Use of Renewable Feedstocks, Designing Chemicals for Degradation, and Real-Time Analysis for Pollution Prevention.</p> <p>This is good news, for the prospects of incorporating green chemical design into industrial applications, but there is still room for improvement. Most</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>immediately work needs to be done to promote Waste Prevention as part of experimental design, and a serious effort needs to commence to encourage the education and research around the Design of Safer Chemicals. The basics of chemical toxicology are not taught at any point during the training of chemists not at the undergraduate level and not even offered in chemistry departments at the graduate level. This is not to say that chemists don't know how and when to work with dangerous chemicals, but this knowledge is gained through laboratory experience, and not formally taught. This also means that the design of new chemicals with important industrial applications rarely, if ever, takes into account the idea that chemical products should be designed to minimize their toxicity. Part of the reason for this knowledge gap is the complexity of biochemical interactions, and the current lack of easy to understand guiding principles to teach at an undergraduate level. This means that if we want to require safer products to be introduced to the market, we need to start by incorporating toxicology into the formal training of chemists, and also invest in toxicology research which could be of fundamental interest to chemists.</p> <p>All twelve of these guiding principles can be incorporated into chemistry research, but their assimilation into basic chemical knowledge is a hierarchical process. It starts at the research stage, where through targeted funding and positive press, new knowledge, procedures, and products are developed. Then, as the ideas become accepted and followed by the research community they will be adopted as part of the graduate level curriculum. Lastly as chemists come to believe that this is how chemistry has always been done it will be adopted as part of the core values/ideas that are taught to undergraduates in chemistry. Although this can be a lengthy process, research funding and legislative pressure on the chemical industry certainly has the power to accelerate the adoption of these ideas by the chemical community. The problem that is in dire need of funding and support is the incorporation of toxicology into the research and training regimen of chemistry students. Also in need of further support are those ideas which are still on the fringes of research and teaching including Use of Renewable Feedstocks Designing Chemicals for Degradation, Waste Prevention and Real-Time Analysis for Pollution Prevention. Industrial chemicals and chemical processes are increasingly a part of our daily life, and as we have seen in Europe the public is demanding higher standards. California has the intellectual resources to lead the way if the proper investments are made.</p> <p>Sincerely, Martin Mulvihill 5th Year Graduate Student John Arnold and Peidong Yang Labs Department of Chemistry UC Berkeley</p>
F-GC-40	<p>Bayer MaterialScience's Comments on California Green Chemistry Initiative</p> <p>At Bayer MaterialScience we share society's values of developing, producing and putting into the marketplace products that are both beneficial and safe for humans and the environment. We respect and support the objectives of Responsible Care® along with sustainable development as a commitment for management and as a responsibility shared by each employee.</p> <p>We at Bayer continue to address green chemistry objectives through innovation and product stewardship. Innovation is essential to driving green chemistry and sustainability in markets such as automotive, green building and alternative energy. Products and their uses are evaluated to help assure intended benefits to society while also protecting public health and the environment. We follow the American Chemistry Council's Responsible Care® program, with a management system that is certified by third-party auditors. We integrate knowledge of potential hazards of chemicals with an understanding of potential use and exposure in our risk management programs.</p> <p>We appreciate the California Green Chemistry Initiative's request for comments on the program and support an approach that addresses the following points:</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<ul style="list-style-type: none"> • Look at the chemical information that is already available to California. • Make it clear that the Green Chemistry Initiative process will be governed by a risk-based science approach. • Support an understanding of both the benefits and the burdens of new regulatory proposals. • Consider process technology as part of a green chemistry program. <p>Look at the chemical information that is already available to California: We believe that California should consider existing data and information already available to California and the public before making judgments on additional chemical specific data and information needs. There are existing programs such as the High Production Volume (HPV) Challenge Program and the Extended HPV Program, which have provided valuable toxicology and exposure information that is publicly available. Hazard information from such sources can be used in light of exposure scenarios to evaluate potential risk and ensure appropriate risk management. In addition, the information from the recent evaluation and categorization of chemicals on the Canadian Domestic Substance List (DSL), Canada, should be considered by California.</p> <p>Make it clear that the Green Chemistry Initiative process will be governed by science with a risk-based approach: We believe that the Green Chemistry Initiative must be based on sound science with a risk-based and weight-of-evidence based approach. Objective and reproducible scientific methodologies are the keystones upon which regulatory policy should be based. Everything can be toxic at some level; the key is to minimize potential risks (risk = hazard x exposure). The Green Chemistry Initiative should be based on the principles of risk. That is, minimizing the use of toxics in light of the exposure scenarios, along with considerations of efficiency and economics.</p> <p>Support an understanding of both the burdens and the benefits of new regulatory proposals: To most efficiently use resources, we believe that consideration should be given to existing chemical management systems. Many existing regulatory and voluntary programs promote innovation and advances in chemical technology, govern areas of product life-cycle, and also promote pollution prevention and research into the use of less hazardous substances.</p> <p>We believe that the Toxic Substance Control Act (TSCA) is a comprehensive chemical management statute. Criticisms of the TSCA to protect human health and the environment often overlook the real need for resources to properly administer the statute. Without the proper staffing and financial resources, any regulatory program will have limited effectiveness.</p> <p>Innovation is critical to green chemistry. Rather than imposing regulatory burdens, innovation through green chemistry can be promoted with positive incentives and partnerships. Green Chemistry should be encouraged through the sharing of expertise, financial support for research, information exchange, and public education. Incentives could be offered for companies to pursue and foster Green Chemistry and Green Engineering.</p> <p>Consider process technology as part of a green chemistry program: Green chemistry is an important consideration in efforts that lead to sustainable development, but it is only part of a potential solution. In a broader sense, green chemistry programs should include process technology considerations as alternative chemistry is being evaluated. This technology can have a significant impact on minimizing potential adverse health or environmental effects of a chemical substance. Process technology can reduce both human and environmental exposures to chemicals, for example, through enclosed systems, recycling of by-products, and controlling potential environmental releases. Use of these process technologies can eliminate the need for substitution of critical raw materials.</p> <p>In conclusion, we believe that a green chemistry initiative must be based on sound science, be risk-based, leverage validated existing health and environmental information, and consider engineering and processing technology. We feel that innovation and partnership with industry should be encouraged. Industry should be brought in as a critical stakeholder in this Initiative as it develops.</p> <p>On behalf of Bayer MaterialScience LLC</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-41	<p>Comments on Green Chemistry from Rohm and Haas Company</p> <p>When assessing the safety of chemicals and products, the focus should not just be on the hazard of a chemical, but also on the likelihood of exposure or risk. Risk may be predicted as a function of how hazardous a substance is and the expected exposure to the substance. This approach relies on risk management, as well as hazard management.</p> <p>Hazard x Exposure = Risk</p> <p>It is important to determine the current level of safety expected by health or environmental end that is desired at the moment with the intent for continual improvement in safety over time. This is in recognition that there is no possibility of 100% safety for even very safe materials. Such an approach can be illustrated by a consideration of cancer as an end point where there is a tacit agreed societally that a level of safety around cancer equivalent to 10-5 to 10-6</p>
F-GC-42	<p>Comments from Rohm and Haas Company</p> <p>Green chemistry, by definition, is a chemical philosophy that encourages the development of products and processes that reduce or eliminate the use and generation of hazardous substances. Green chemistry not only encourages the development of new 'greener' products, but also may include the revision of existing products and processes for safety or an environmental gain.</p> <p>Market incentives would drive the development of Green Chemistry more successfully than a regulatory scheme. Rohm and Haas Company strives to create not only products that are useful and profitable, but also may provide an environmental benefit. The Rohm and Haas Company has committed to direct 50% of our Research and Development budget to sustainable, environmentally advanced technologies within the context of market incentives as a driver for Green Chemistry.</p> <p>Rohm and Haas Company has shown its commitment to Green Chemistry through the development of the following products:</p> <ul style="list-style-type: none"> • The Aquaset™ product line is a pioneering technology platform made without formaldehyde or formaldehyde-generating materials for use in industrial nonwovens, including fiberglass webs for roofing, flooring, insulation, and filters. • SEA-NINE® 211N antifouling agent represents a significant ecological advance for marine paints because of its environmentally acceptable properties. It degrades rapidly in sea water and sediment, does not bioaccumulate in marine species, and is not a chronic or reproductive toxin. • The AVANSE™ product line is a high-performance, low VOC waterborne acrylic resin binder technology for use in Industrial Maintenance segments: primers, topcoats and direct to metal (DTMI) finishes.
F-GC-43	<p>Green Chemistry Initiative Public Comments</p> <p>Fossil-fuel-based plastic use in our society continues to grow at an exponential rate, creating a plethora of environmental impacts for California, the oceans and, increasingly places like Lianjiao, China (see http://news.sky.com/skynews/video/videoplayer/0,,31200-greenbritain_china_p222,00.html).</p> <p>The State of California has one of the most impressive recycling mandates in the country but I am very concerned about where our recycling, especially our plastic, is going.</p> <p>Most consumers believe that their fossil-based plastic, once placed on the curbside for recycling has been taken care of in a way that renders any potential problems with plastic waste solved.</p> <p>Myself and my colleagues at Green Sangha have been working over the past 2.5 years educating the public regarding plastic waste issues including pollution in the ocean.</p> <p>The central Pacific Gyre contains a plastic waste mass that has been measured to be larger than the state of Texas. Because plastic does not biodegrade, plastic entering the oceans remain there unless it is deposited on a distant beach. Fossil fuel-based plastic has entered the marine food web at many trophic levels impacting countless marine species (birds, salps, marine mammals, etc...)please see:</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>http://www.algalita.org/pelagic_plastic_mov.html Small bits of plastic in the central Pacific Gyre outweighs zooplankton at a ratio of 6:1 (six pound of plastic for every pound of plankton!), according to research published by the Algalita Marine Foundation. Of greatest concern for my organization and me right now is what is happening to our plastic waste once it leaves the US shores not as litter but as commerce. At the link, http://news.sky.com/skynews/video/videoplayer/0,,31200-greenbritain_china_p222,00.html please find some news footage shot by Sky News in the UK. This news story highlights the situation that Californians don't know about and never see. It is the story of the dark side of plastic downcycling that all policy makers need to see, we believe. This short news piece is of great importance regarding plastic policy here in California. The plastic industry continues to repeat the mantra that plastic is fine; we must continue to use it but we need to do a better job recycling. I'd like the Green Chemistry Initiative to first acknowledge that fossil plastic is downcyclable not recyclable. And that most of our fossil plastic waste is being shipped overseas and being handled under conditions that are harming water, air, public health and the land surrounding so-called recycling facilities. In the video workers are exposed to mountains of unsanitary plastic waste. They melt it down and/or burn it; smoke and ash fills the air. Untreated polluted water runs into local streams turning them dark grey; they too are littered with plastic and ash. Workers are subjected to toxic fumes and heavy metals where PVC is downcycled without any idea that their work is dangerous.... Needless to say, there are no health or environmental standards in places such as Lianjiao, China. Our continued embrace of plastic needs to be looked at with a cradle-to-cradle perspective, which requires a close look at what is happening overseas. The Green Chemistry Initiative is for California, but for the initiative to have integrity in cannot be part of exporting waste that is causing great harm overseas. We in California need to develop closed-loop safe and just ways of handling our waste. The current model of exporting plastic to countries such as China needs to be stopped if California is serious about its Green Chemistry Initiative.</p> <p>Andy Peri Green Sangha</p> <p>Further information provided: a link to the short online version of the video described above and some articles regarding waste exports to China.</p> <p>on behalf of Andy Peri</p>
F-GC-44	<p>Harmonization of Regulations Chemicals, through the different steps from their production to their handling, transport use and final disposal, are at each of the aforementioned steps a potential danger for human health and the environment unless handled constantly with appropriate way . Persons of countries using many different procedures, regulations and terms of reference are daily confronted to chemical products (chemicals, pesticides, etc.) which may cause them and their environment some harm. Current Regulatory situations e.g. US TSCA, EU Risk Assessments, REACH, RoHS</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>and as witnessed by some individual states are potentially taking unilateral precautionary approach through incorporating legislations and bans on some chemical products in absence of scientific evidence or waiting for research findings with respect to such chemicals impact, or extent of impact or even level of risk if it is acceptable or not in the absence of alternatives. Examples are decaBDE and the proposed ban on TBBPA by Norway. In view of this reality, a harmonized set of regulations developed consistently around science-based research, standards for testing, classification, labeling certification and handling of various chemicals, a set that is widely understood and Internationally recognized within a common framework and under unified terms of reference is needed to ensure the safe use, transport and disposal of chemicals. Once countries have consistent and appropriate information on the chemicals they import or produce in their own countries, the infrastructure to control chemical exposures and protect people and the environment can be established and managed in a comprehensive manner.</p> <p>A new system, aimed at developing a single, globally harmonized system to address classification of chemicals, labels and safety data sheets etc, which is called "Globally Harmonized System of Classification and Labeling of Chemicals (GHS)", addresses classification of chemicals by types of hazard and proposes harmonized hazard communication elements, including labels and safety data sheets. It aims at ensuring that information on physical hazards and toxicity from chemicals be available in order to enhance the protection of human health and the environment during the handling, transport and use of these chemicals. The GHS also provides a basis for harmonization of rules and regulations on chemicals at national, regional and worldwide level, an important factor also for trade facilitation.</p> <p>Ahmad Khalifeh Managing Director Albemarle Middle East & General Manager of Jordan Bromine Comapny, both affilaites of Albemarle Corporation.</p>
F-GC-45	<p>WHY ARE WE DOING THIS?</p> <p>As we near the end of this first phase of California's Green Chemistry Initiative, we have accrued a broad range of options on how to assure a higher margin of safety in the use of chemical products. Looking forward to the challenge of integrating these into coherent programs, it is useful to revisit a</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>fundamental question: Why are we doing this? Certainly the enhancement of protection of the environment and human health is the major driver, but the real challenge of this process is to both protect and to enable. The science of chemistry (and its dramatically evolving interfaces with biology and physics) will be a key to delivering a more sustainable future not only in California and the rest of the developed world, but throughout a developing world poised at the threshold of advancing well-being. In a sense, the next phase of this Green Chemistry Initiative is taking on a challenge that was the focus of a 2005 conference of the US National Academy of Sciences "Sustainability in the Chemical Industry: Grand Challenges and Research Needs." Mike Wilson referenced the Report on these proceedings in his 2006 paper that has triggered so much of California's interest in Green Chemistry. I referenced it as well in my blog submission of last spring. It is worth revisiting, however, as we enter the stage where we must integrate options into a package that advances our interests in both a higher level of protection and in enabling advances toward sustainability (the Report is available at: http://www.nap.edu/catalog/11437.html). The Academy's Report focuses on the "protection" challenges. These include advancing our understanding of Toxicology, application of principles of Green and Sustainable Chemistry, and extending the use and sophistication of the Life Cycle Analysis integral to green chemistry. Importantly, this broad agenda of challenges for which the society is depending upon an agile and innovative chemical industry (and to which this California Initiative should contribute) also includes "enabling" chemistry's contribution to broad societal needs in:</p> <ul style="list-style-type: none"> • Renewable Chemical Feedstocks • Renewable Fuels • Energy Intensity of Chemical Processing • Separation, Sequestration and Utilization of Carbon Dioxide • Sustainable Education <p>Why are we doing this? We are not engaged in this process simply to "protect" – we must "enable" at the same time. The next phase of our effort will require more from us. That is why these are, indeed, our "Grand Challenges."</p>
F-GC-46	<p>Professor of Political Science, Rensselaer Polytechnic Institute In studying the green chemistry movement for the past decade from the perspective of political science, I have been impressed with both the technoscientific ingenuity and the political-economic naivete of most participants. The key issue is funding to replace outmoded plant and equipment. Worldwide detoxification of the industry will cost something on the order of \$10 trillion, perhaps \$500 billion in California alone. There is only one reliable source for such funding: an excise tax on chemical sales to create a Chemical Trust Fund analogous to the Highway Trust Fund paid for by gasoline purchasers. Create a large pool of funding and all else will follow; fail to do so, and chemical greening will continue to lag no matter how many deliberative processes and other talk-oriented activities well-meaning people engage in. In this respect, the chemists who implicitly or explicitly argue for sole reliance on voluntary action are actually a barrier to implementing the very green chemistry they are developing and advocating</p>
F-GC-47	<p>Green Chemistry and Beyond: Sustainability, Safety and Continual Improvement GREEN CHEMISTRY AND BEYOND: SUSTAINABILITY, SAFETY AND CONTINUAL IMPROVEMENT</p> <p>INTRODUCTION Earlier this year, California kicked off its Green Chemistry Initiative with the stated goal of taking a collaborative approach to significantly reduce the impact of toxic chemicals on public health and the environment. The Soap and Detergent Association provides the following comments on behalf of its members so that California may consider new ways to manage chemicals towards the continual improvement of public and environmental health. The Soap and Detergent Association (SDA) is the non-profit trade association representing manufacturers of household, industrial, and institutional cleaning products, their ingredients and finished packaging; oleochemical producers; and chemical distributors to the cleaning product industry</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>(http://www.cleaning101.com/). SDA members produce more than 90 percent of the cleaning products marketed in the U.S. SDA members strive to meet the commitments of a sustainable industry: 1) advancement of social well-being, 2) advancement of human health and environmental quality, and 3) economic growth. Cleaning products have been an integral part of the dramatic advancements in public health and longevity, and the decline of communicable diseases throughout the world over the past two centuries. SDA and its members have been at the forefront of research on the environmental and human-health safety of their products for the past 50 years, and a culture of innovation and continuous improvement among its members has resulted in a robust industry that is a leading contributor to the public health across the country.</p> <p>SUSTAINABILITY</p> <p>Social Sustainability SDA members are committed to contributing to a better quality of life for our consumers, business partners, employees and the communities in which we operate, and to maintaining a high level of product stewardship throughout the chain of commerce. As such, we believe that decisions of preferability and substitution should be based on the comparative life cycle impacts of a chemical and its potential substitute. While a safety-based characterization scheme may focus on toxicity, persistence and bioaccumulation, there are a number of other parameters which are relevant to the sustainable use of a particular chemical in a formulation such as raw material sourcing and carbon footprint. All relevant aspects of sustainability should be taken into consideration for a potential substitution decision. Similarly, any plan to consider substitution of chemicals should require that the efficacy and benefits of that compound be considered as any diminution of efficacy may negatively impact public health and well-being through reduced hygiene and sanitation.</p> <p>Environmental Sustainability Cleaning products are chemical formulations, and generally each ingredient in a formulation will have some measurable toxicity. However, the use of cleaning products generally is well understood, leading to sound characterizations of exposures and risks. SDA members are committed to the enhancement of human health and quality of life through the responsible formulation, production and sale of cleaning products and ingredients, and their proper use. SDA members only market products that have been shown to be safe for humans and the environment, through careful consideration of the potential health and environmental effects, exposures and releases that will be associated with their production, transportation, use and disposal. In determining the safety of cleaning products, toxicity of ingredients to humans and wildlife is studied.</p> <p>Economic Sustainability The cleaning products industry is an important component of this nation's public health infrastructure and a contributor to the nation's economic well being. As such, it is important that the Green Chemistry Initiative not compromise this industry. SDA members are committed to innovating to improve products both in terms of performance and environmental impact. The Green Chemistry Initiative must ensure that product efficacy, performance, and usability are not undermined, and that the ability to innovate is not compromised. In fact, California is uniquely well positioned to foster innovation in Green Chemistry and product formulation. With a strong educational system including world-class research university and a robust high technology sector, California has the means to lead the world in developing and commercializing alternatives to high priority chemicals of concern. The Green Chemistry Initiative should include a significant component related to research and development of alternatives for high priority chemicals which leverages California's intellectual resource. Through such efforts, California could facilitate the development and application of chemicals that will reduce negative impacts to the citizens of California.</p> <p>SUGGESTIONS FOR CALIFORNIA</p> <p>Confirming the Baseline Safety of Chemicals in Commerce In order to affect the impact of toxic chemicals on public health and the environment, the inherent hazards and potential for exposure should be integrated into a risk framework, and risks should be managed appropriately. Currently, there are several national and international programs designed to evaluate</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>and manage the risks of chemicals. California should leverage existing efforts and customize results to meet their needs. For example, in Canada, Environment Canada completed a prioritization exercise of 23,000 chemicals on their Domestic Substances List (DSL) in 2006. Using information from Canadian industry, academic research and other countries' data, Government of Canada scientists worked with partners in applying a set of rigorous tools to the 23,000 chemical substances on the DSL. They were categorized to identify those that were: inherently toxic to humans or to the environment and that might be persistent and/or bioaccumulative, and substances to which people might have greatest potential for exposure. From this exercise there were over 4,000 chemical substances identified as needing further attention, and about 19,000 (over 80% of the total) were set aside as not needing further action based on their hazard and exposure profiles. Among the chemicals needing further attention, 500 were high priority, 2600 were medium priority and 1200 were low priority, and most of the low priority chemicals were eliminated from consideration. Additionally, about 150 of the high priority chemicals were determined to not be used in Canada and were restricted from further use without an evaluation. In the end, Canada has moved forward to consider about 350 high priority chemicals and 2700 medium priority chemicals.</p> <p>California could focus on the 500 high priority substances identified in Canada's program. To address unique circumstances that might exist in California, the State could have a process to add substances to the high priority list, as necessary, based on hazards, uses and exposures to workers and consumers in California. Once the high priority chemicals are identified, use and exposure should be considered to determine whether there are impacts on human health and/or the environment. The State could work in coordination with other North American initiatives (e.g., Canadian Domestic Substances List prioritization, EPA and OECD High Production Volume Chemical programs, Security and Prosperity Partnership (SPP) of North America Regulatory Cooperation Framework) in order to assess the risks of the highest priority chemicals. In undertaking such programs, SDA urges the State to proceed with any chemical assessments in a manner that would avoid unnecessary animal testing. In cases where real impacts exist, risk management strategies should be implemented in order to reduce those impacts, including use-specific restrictions where there are unacceptable risks.</p> <p>Continual Improvement of the Safety Profile of Chemicals in Commerce</p> <p>California can continually improve the safety profile of chemicals in commerce in the State by focusing on the high and medium priority chemicals in use, and using Green Chemistry and other tools to facilitate informed substitution with chemicals having an improved safety and life cycle profile. There are a number of opportunities for California to apply its resources towards traditional Green Chemistry activities. California could leverage the universities in the State and the high-tech business sector towards the development of alternative chemicals for those of the highest priority, and development of alternative manufacturing processes for those with high discharges of hazardous waste. For alternatives identified, there should be a separate Life Cycle Assessment by an outside party, or state-funded Center for Excellence in order to confirm that there is no loss in performance with the alternative, to avoid unintended consequences, and to assist in commercialization. The State also could develop a Cooperative Extension-type program to assist companies in Cradle-to-Cradle product design/formulation and assist in adoption of new alternative chemistries and processes. In order to facilitate informed substitution of high priority substances towards those with a more favorable environmental and human health profile, the State could develop database of chemical alternatives that compares a number of sustainability parameters: performance, price, human health and environmental (e.g., toxicity, bioaccumulation, persistence) including carbon footprint and source sustainability. Additionally, the State could map the flow of chemicals in California using information drawn from existing sources such as EPA's Inventory Update Reporting (IUR), the data received by Canada during its data call-ins for high priority chemicals, and other contributions from the public. In order to assess the performance of these programs and measure the impact of these reforms, the State should monitor metrics that will assess releases of chemicals to the environment and exposure to humans.</p> <p>Increased Transparency and Access to Information on Chemicals in Commerce</p> <p>California could expand access to information on chemicals for consumers, businesses and regulators by leveraging its preeminence in data management and mining in order to organize the world's chemical data. For example, the dossiers for the EPA High Production Volume (HPV) Chemical Challenge</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>program, and the related European program are often difficult to find and the data difficult to extract. By partnering with the information technology sector (e.g., Internet search firms), the State could expand access to chemical information, support its local industry and raise awareness of chemical safety information currently available. Additionally, California could expand product-specific chemical ingredient disclosure for consumer products which currently do not have that requirement. To increase transparency and improve the management of chemicals in the workplace, California should adopt the 16-section Material Safety Data Sheet (MSDS) described by ANSI Standard Z400.1-2004.</p> <p>Recognition and Rewarding Success</p> <p>As California's Green Chemistry Initiative unfolds, it will be important to recognize efforts and reward successes. The State could establish a registry for companies seeking to align their business practices with the Green Chemistry principles and acknowledge their intent. Similarly, the registry could accumulate examples of product development decisions and substitutions that have resulted in reduced waste produced and energy inputs. The registry could be the basis for recognition of successes in reducing impacts from chemical exposures similar to the Presidential Green Chemistry Challenge Award, but focusing on results achieved through implementation of a program or application of a new chemistry rather than development of a new technology.</p> <p>SUMMARY</p> <p>California's Green Chemistry Initiative should emphasize all three components of sustainability: the social benefits of chemicals and products, the economic contributions through innovation and improved performance, and the environmental and human safety. California can confirm the baseline safety of chemicals through a prioritization based on hazard and exposure, assessment of risk, and management of risks including use-specific restrictions where necessary. California can drive innovation, the benefits of products and the continual improvement of the safety profile of chemicals by leveraging the State's expertise, and applying resources to the application of Green Chemistry research and development. California can expand access to information on chemicals in order to improve decision-making by taking advantage of their data management industries to organize the world's chemical data, and by increasing the disclosure of chemical ingredients in consumer products. Once California has implemented its Green Chemistry Initiative, it should recognize the efforts of those industries seeking to apply the principles of Green Chemistry and provide recognition to those that have had notable success.</p>
F-GC-48	<p>Director General of the Jordan Institution for Standards and Metrology</p> <p>The Jordan Institution For Standards and Metrology is pleased to make input to the discussions about California's Green Chemistry Initiative. The chemical industry is very important to Jordan. Jordan has considerable economic interest in the development of chemicals based on our natural phosphorus and bromine reserves. It is also recognized that it is necessary to address societal concerns over the safety and environmental impact of any given chemical. It is to be hoped that California can provide a lead in developing policies and regulations that provide an objective process for the evaluation of chemicals that will give confidence to the public that the chemicals in use are safe; and to industry that such chemicals have a sustainable future which allows for ordered economic development.</p> <p>In addition, the initiatives in line with SAICM could provide an important way forward, with emphasis on the management of chemical substances, through better knowledge and understanding.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
	<p>To this end we would emphasize the need for policies and regulations based on solid scientific data that address the risks associated with the use of a given chemical in its applications."</p>
F-GC-49	<p>Green Chemistry Should Incorporate an Alternatives Assessment Decision-Making Process I encourage DTSC to incorporate the alternatives assessment decision-making process, which Mary O'Brien has written about in her book, "Making Better Environmental Decisions: An Alternative to Risk Assessment." It would help tremendously if DTSC initiated a serious consideration of Ms. O'Brien's suggested approach to environmental decision-making. Ms. O'Brien recommends (1) the consideration of a full range of options, (2) the consideration of the potential adverse effects of each option, (3) the consideration of the potential beneficial effects of each option, and (4) whenever the public might be affected, a genuine public process that provides the public a say in the outcome of the environmental decision. As opposed to relying upon risk assessments and risk management decisions, this approach (1) focuses us on identifying a range of sustainable actions, (2) allow us to identify options that minimize harm and maximize benefits, (3) allows all sectors of society to participate in decisions, not just risk assessors, (4) avoids the methodological problems associated with trying to perfect risk assessments, (5) encourages creativity, (6) holds those who pollute responsible for identifying better ways to proceed, (7) maximizes economic benefits for the general public, and (8) encourages forward-looking approaches and long-term solutions. November 14, 2007 Joe Lyou As part of the critical alternatives assessment process, we must all be aware that current OSHA PELs permit workers to be exposed to toxics including carcinogens and developmental toxicants at levels much higher than allowed in the general environment. A Just Transition to Green Chemistry should include closing this 'allowable exposure' gap and providing medical surveillance for exposed workers</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-50	<p>AWFS Comments on the Green Chemistry Initiative</p> <p>The Association of Woodworking & Furnishings Suppliers® (AWFS®) is a California based trade association of manufacturers and distributors of machinery, hardware, lumber, upholstery materials, bedding components, wood products and other supplies to furnishings, cabinet and other wood product manufacturers. AWFS® appreciates the opportunity to comment on Governor Schwarzenegger's Green Chemistry Initiative. AWFS® members support science and risk-based chemical and product regulation. As manufacturers and suppliers to US-based wood product and furnishing businesses, AWFS® is concerned with government regulations that are not fairly or adequately enforced on consumer products or components from overseas.</p> <p>Two recently adopted sets of regulations serve as examples. The first is the new fire retardant regulations adopted by the California Bureau of Home Furnishings and Thermal Insulation (BFHTI) and the second is a recently adopted Air Toxics Control Measure for formaldehyde in composite wood products used in furniture by the California Air Resources Board (CARB). These regulations, in theory, are to be enforced at the manufacturer, distributor and retail level. BFHTI and CARB have the capability to inspect domestic manufacturers, however, neither have demonstrated the ability to enforce the rule against products coming from overseas either at the distribution or retail level.</p> <p>Domestic manufacturers are spending time and money to comply with the regulations. The added costs of compliance will affect every business in the supply chain, including wood processing companies, machinery companies, fabric and filling companies as well as manufacturers of finished goods. Domestically made products will meet the new standards at a higher cost, while there is no guarantee that imported products will meet the same standard and will be sold at a lower cost. The effect of both the FR regulation and the CARB regulation on AWFS member companies and the many companies located in California that utilize their products will be played out in the coming years.</p> <p>It is important that the California Environmental Protection Agency and its departments recognize that environmental regulations and rules be enforced equally between domestic and imported products and that provisions for doing so are built into the regulations rather than tacked on as an afterthought.</p>
F-GC-51	<p>Feedback - California Green Chemistry Initiative</p> <p>The following is feedback to the questions provided by the Department of Toxics Substances Control.</p> <p>After over 16 years of environmental engineering experience working for the Department of Defense (DOD), two tools have been identified that require coordination and work to fully implement. These tools are standardization of the LCA process as feasible covering most products and the Chemical Compliance Systems (CCS) quantitative analysis database programmed with data to rank any chemical relatively to the universe of chemicals (quantitative analysis) and compare to the regulatory limits using the standardized environmental performance characteristic data provided by EPA and CAL EPA.</p> <p>With some work, these approaches would significantly improve the environment. At DOD and with those I interface with in the DOD and industry, it not a question of the intention to improve the environment and work "beyond compliance," but is a question of providing key data to the chain of industries moving product to market. This is now possible utilizing the CCS tool or similar applied to the LCA stages.</p> <p>Beyond the work, is a key to require manufacturers of chemicals, substances and products to provide both the hazardous chemicals in the Materials Safety Data Sheet (MSDS) and the nonhazardous chemicals so that a valid green rank score and comprehensive report may be provided via the web on-line automatically and real time. The report contains all the CALEPA and FED EPA environmental characteristics of concern with a normalized Environmental SCORE organized by the key areas ECOLOGY, HUMAN HEALTH and HUMAN SAFETY.</p> <p>Utilization of the ISO 14001 Environmental Management System (EMS) continual improvement for the environment of sustainability is an active process in DOD and city municipalities in whole or part that provides the management approach. Key is feedback to the manufacturers of chemicals, academia, industry, consumers etc so that the best choice for the environment may be made by all.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>This will mitigate the predicted increase of toxic pollution in the environment by CAL BERKLEY (see www.ucop.edu/cpre) "Special Report" Green Chemistry in California despite all the effort.</p> <p>Beyond Compliance is normal standard practice by DOD and industry. The key is quality real time information feedback to make the best choices by all involved in the "Cradle to Cradle" process of manufacturing-construction-R&D. As a team much is possible. Playing this in parts and pieces is not efficient.</p> <p>Further comments on Cradle to Cradle, Green Chemistry and Toxics in Products by Design.</p> <p>on behalf of Ray Paulson, P.E. Fleet Readiness Center Southwest North Island</p>
F-GC-52	<p>The Green Chemistry Initiative Should Consider All Existing Programs That Regulate Toxicity, Risk Management and Reporting</p> <p>The importance of chemicals and our reliance upon them in our everyday lives has led to myriad programmatic requirements. Today, the chemical industry and industries that use chemicals in production or manufacturing are one of the most heavily regulated industries in the State. These programs take many forms, but can be grouped by those that focus on chemical toxicity, those that manage exposures and risk and those that require extensive reporting. These programs have had great success in reducing or eliminating environmental, occupational and public health risks.</p> <p>Originally passed in 1986 by California voters, Proposition 65 prohibited contamination of drinking water with chemicals known to the state to cause cancer or reproductive harm. Companies are also required to post public notices of any known potential exposure to a chemical known to the state to cause cancer or reproductive harm. This law has had a fundamental impact in the selection of input chemicals, reuse, recycling and other treatment of waste streams to remove chemicals covered by it to avoid any water discharge and reduce potential exposures.</p> <p>Since 1987, the California legislature, through AB 2588, has required stationary sources to report the use (both type and amount) of certain chemicals and to undertake a risk assessment of potential offsite risks posed by their use.</p> <p>In 1989, California enacted the Hazardous Waste Source Reduction and Management Review Act of 1989 (SB 14) in an effort to reduce the generation of hazardous waste and to also prevent the release into the environment of chemical contaminants. Since the enactment of SB 14 California companies have significantly reduced the generation of hazardous waste and eliminated the costs involved in managing those wastes.</p> <p>In addition to California specific reports, businesses are also required to file reports with various federal agencies. While sometimes similar to those filed with state agencies, more often than not these reports are separate and distinct, and sometimes duplicative, from what is filed with the State. Examples of these reports include the SARA 313 Toxic Release Inventory Determination Report and the Department of Homeland Security Chemical Facility Security.</p> <p>The following list categorizes some of the various federal and state chemical regulatory and reporting programs, offices and data repositories by their primary emphasis: Toxicity, Exposure and/or Risk. Note that several programs have overlapping jurisdictions, and there are also local programs with additional recordkeeping and reporting requirements. Each of these programs and individual requirements needs to be thoroughly understood and evaluated for significant gaps that need to be addressed to reduce a specific risk. This effort should be completed before any new program or data requirement can be assessed as part of this Initiative.</p> <p>Toxicity Toxics Substance Control Act Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) Hazardous Material Release Reporting and Response Plans Hazard Communication (OSHA) Pesticide Contamination Prevention Act</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>National Institute for Occupational Safety and Health (NIOSH) CA DHS – Hazard Evaluation System and Information Service (HESIS) Office of Environmental Health Hazard Assessment (OEHHA) Consumer Product Safety Act Endangered Species Act - Biological Opinions and Jeopardy Assessments National Institutes of Health National Library of Medicine Databases Exposure Toxics Substance Control Act Pollution Prevention Act of 1990 Emergency Planning and Community Right to Know Act of 1986 Hazardous Materials Release Response Plans and Inventory Hazardous Material Release Reporting, Inventory and Response Plans Air Toxics “Hot Spots” Emissions and Assessment Office of Environmental Health Hazard Assessment Federal Insecticide, Fungicide and Rodenticide Act Hazard Communication Resource Conservation and Recovery Act National Institute for Occupational Safety and Health (NIOSH) Hazardous Waste Source Reduction and Management Review Act of 1989 (SB 14) Pesticide Contamination Prevention Act CA Hazardous Waste Management Regulations CA DHS – Hazard Evaluation System and Information Service (HESIS) Safe Drinking Water and Toxic Enforcement Act (Prop 65) Office of Environmental Health Hazard Assessment (OEHHA) Federal and State Clean Air Acts Clean Water Act Porter-Cologne Act Federal Safe Drinking Water Act Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Food, Drug and Cosmetics Act Federal and State OSHA’s – Worker Safety Standards Site Mitigation and Brownfields Reuse Program Database Unidocs Hazardous Materials Online Inventory Project OSHA Integrated Management and Information System CDC National Occupational Exposure Survey Endangered Species Act – Biological Opinions and Jeopardy Assessments National Environmental Policy Act</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>California Environmental Quality Act National Institutes of Health National Library of Medicine Databases</p> <p>Risk Identification and Management Toxics Substances Control Act Pollution Prevention Act of 1990 Emergency Planning and Community Right-to-Know Act of 1986 Air Toxic "Hot Spots" Emissions and Assessment Federal Insecticide, Fungicide and Rodenticide Act Pesticide Contamination Prevention Act Hazardous Materials Release Response Plans and Inventory Hazardous Material Release Reporting, Inventory, and response Plans Hazardous Communication Resource Conservation and Recovery Act (RCRA) Hazardous Waste Source Reduction and Management Review Act of 1989 (SB 14) Nat'l Institute for Occupational Safety and Health (NIOSH) CA DHS – Hazard Evaluation System and Information Service (HESIS) Office of Environmental Health Hazard Assessment (OEHHA) Safe Drinking Water and Toxic Enforcement Act (Prop 65) Federal and State Clean Air Acts Clean Water Act Porter-Cologne Act Federal Safe Drinking Water Act Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Food, Drug and Cosmetics Act Federal and State OSHA's – Worker Safety Standards Site Mitigation and Brownfields Reuse Program Database Unidocs Hazardous Materials Online Inventory Project OSHA Integrated Management and Information System CDC National Occupational Exposure Survey Endangered Species Act – Biological Opinions and Jeopardy Assessments National Environmental Policy Act California Environmental Quality Act National Institutes of Health National Library of Medicine Databases</p> <p>As each of these specific program elements and specific data requirements is evaluated for purpose and benefit, a shorter list can be compiled of specific program elements that should be examined more closely. Additionally, gaps in programs that could lead to exposures that could give rise to unacceptable levels of risk should also be noted. The objective of this review is to focus further efforts on those topics where risks are not now managed at an</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>acceptable level. CCEEB believes that this can be an effective exercise if its focus is on the identification of programs that are not working effectively to achieve their original purpose or to identify gaps in program and data coverage. CCEEB urges the Agency to avoid suggesting the collection of data for data sake and to avoid recommending new programs that may be in place elsewhere that are not reflective of California's already robust regulatory program.</p>
F-GC-53	<p>Making the California Green Chemistry Initiative Workable The California Green Chemistry Initiative (GCI) is an innovative mechanism with the potential to influence the design of products in ways that reduce the use of harmful chemicals and generate less waste and pollution. The objective to create partnerships between industry, the public, and government agencies to bring about this change represents an interesting social experiment. The success of such partnerships will surely rest upon the ability to simultaneously meet the competing needs of all stakeholders. Chemical Compliance Systems, Inc. (CCS) believes we have unique resources that can effectively assist California result in successfully establishing GCI partnerships.</p> <p>CCS has compiled the largest and most accurate relational hazardous chemical/product and regulatory databases in the world over the past 22 years. These unique databases have been derived from over 1,000 sources and are currently comprised of approximately 75,000,000 data elements for 210,000 chemicals, 350,000 products and munitions, and 650 local, state, federal, international and nongovernmental organization regulations. These databases are maintained current, expanded on a daily basis, and are constructed to facilitate utilization of discrete elements in a wide spectrum of analytical compliance systems. CCS has currently developed 13 nonmunition and 10 munition Web-based analytical compliance software modules that utilize different elements from these databases and could immediately be implemented, or easily be customized, to support GCI requirements/needs. In addition, CCS has developed eight detailed concepts that will apply to more broadly defined GCI considerations.</p> <p>CCS has been working to "green" products and the environment for nearly 10 years. We currently have four separate, but equivalent, Web-based "green" analytical compliance systems for chemicals, products, processes and munitions. Each of these four modules utilizes the same 43 specific ecological, health and safety criteria to quantitatively evaluate the "greenness" of a chemical, product, process (including wastestreams), or munition. Each of these systems also includes alternative product/process constituent chemical data tables to facilitate the selection of a less harmful ingredient. In combination, the "green" product/munition and process modules provide a complete life cycle (i.e., "cradle to cradle") analytical capability. Each has product design and evaluation capabilities that enable chemists/engineers to design "greener" products/processes upfront, and acquisition, regulatory and ecological/health/safety professionals to assess, or compare, the "greenness" of the overall product/process (wastestream) to the level of detail they require. Each of these modules also simultaneously identifies the regulatory impact of the overall product/process, parts or components, or individual constituents. These tools will enable California regulatory agencies to partner with industry and the public to establish objective and quantitative "green" standards, or performance measures, for products and processes that can be incrementally increased over time and apply fairly to both small and large companies. The utilization of harmful chemicals will be reduced and less waste and pollution will be generated. The "green" standard will be a known, level playing field for industry, and the result will be greater protection for workers, the public, and for the environment. These "green" capabilities have also been incorporated into a Web-based Chemicals of Concern module that can quantitatively rank the concerns for a chemical/product inventory at a facility, thereby focusing alternative chemical acquisition, or research, on the worst offenders first, effectively accelerating pollution prevention.</p> <p>CCS regulatory compliance capabilities draw upon our List of Lists data that currently includes 650 state, federal, international, and nongovernmental organization lists and associated data. Our Web-based compliance capabilities are available as standalone modules, or incorporated into other analytical</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>tools (as described above). Compliance assessments can be applied to facility inventories, products/processes, waste classification, and/or CERCLA/RCRA site remediation. CCS is scheduled to develop a new, Web-based Health Risk Assessment module for the U.S. Army that will utilize our existing, Web-based Conceptual Site Model, and simplify RCRA Subpart X and CAA Title V Permit applications. Finally, CCS has conceptualized a Chemical Homeland Security System (C-HoSS) that will utilize existing facility chemical/product inventories to quantitatively rank resident chemical hazards, security risks and mortality risks by location at the facility. These three reports quickly prioritize inventory concerns. Entry of container accessibility constraints (i.e., storage conditions that control access) for chemicals of greatest concern enables C-HoSS to rank container vulnerabilities and identify accessibility requirements to nullify all vulnerabilities. C-HoSS concern levels are made proportional to the Homeland Security Advisory System daily risk levels. C-HoSS addresses all four levels in an effective security program (i.e., vulnerability assessment, corrective strategy, third party verification, and management system incorporation). C-HoSS will be a good tool for effectively eliminating terroristic chemical vulnerabilities at a facility. In addition, C-HoSS could have direct utility for preparation of California permit-required Security and Emergency Response Plans. Implementation of C-HoSS across the entire State of California can be accomplished “free,” utilizing a state grant for “equipment” from the Department of Homeland Security.</p> <p>CCS hereby offers to provide a remote demonstration of our existing Web-based capabilities and detailed concepts, at no charge, to any parties interested in their potential utilization in support of the California GCI, to achieve corporate “green” objectives, or to utilize in “green” product acquisition.</p>
F-GC-54	<p>Measuring the Greenness of Products</p> <p>My name is George Kopcsak. I am the former Deputy for Munitions in the Office of the Secretary of Defense. During that time efforts were initiated to accelerate the demilitarization (DEMIL) of approximately 1 million tons of old, outdated, unstable and/or incompatible munitions in our nation’s stockpile. Initially this was accomplished through open burn and open detonation techniques. More recently there has been much focus on more environmentally friendly means to destroy munitions or to recycle the components. Some of this work is done within the state of California.</p> <p>Within the past decade a small business organization, Chemical Compliance Systems (CCS), has developed a metric to determine the environmental impact when differing DEMIL techniques are utilized. This metric is called the Green Munitions Analytical Compliance System (G-MACS) and was sponsored and initially funded by the US Army. I’m happy to say that this tool now exists on the web. Since this tool evaluates the ecological, health and safety risks associated with munitions by breaking each down to the chemical level I have learned that the tool can also be used by munitions designers and producers to evaluate the environmental impact of specific chemicals used to make the devices. The designer now has a tool to change specific components within a munition design and determine its positive impact on the “Greenness” of the design. The idea can now be carried forward to look at designing munitions to ease the environmental impact of its anticipated DEMIL 20 years down the road.</p> <p>Since CCS has focused on munitions at the chemical level they have been able to broaden their “compliance system” tools looking at any and all products being designed, produced, or destroyed as long as the chemical composition is known. This looks like a good fit with the California Green Chemistry Initiative. I believe that you should seriously consider its use.</p> <p>As a final note, the web-based CCS tools (G-MACS, GP-CAS, and G-MACS) appear to have the capacity to look at chemical compatibility issues related to their close proximity with a product design. This may well become important when one considers the environmental impact of munition/product aging or temperature cycling.</p> <p>Please give these tools a look.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-55	<p>Dow Chemical's Comments on Chemical Management Systems The Dow Chemical Company (Dow) appreciates the opportunity to provide additional comments on a recent discussion initiated by the California Environmental Protection Agency on chemicals management policy. As a company providing products and services in over 175 countries, we comply with a broad range of chemical management policies and programs. Dow supports a consistent, coordinated regulatory environment for products at global, national and regional levels to complement industry voluntary efforts and to ensure a level playing field. Where new regulations are required, they should be based on established scientific risk assessment and risk management principles – predictable, flexible and capable of responsibly addressing society's economic, environmental and safety requirements. We recognize that regulatory systems will inevitably vary by country since they must work effectively within the broader statutory and regulatory framework for each country. Nevertheless, we generally support broad regional programs that provide the greatest consistency and uniformity for the industry as a whole.</p> <p>As a result, Dow is not an advocate for any particular program. Instead, we have developed a set of principles for effective chemical management programs. As governments select specific legislative or regulatory approaches to product safety or chemical control policies, we believe that certain principles should be adhered to, and we present them below.</p> <p>on behalf of Dow Chemical Company</p>
F-GC-56	<p>BSEF's Chemical Policy Recommendations The Bromine Science and Environmental Forum (BSEF) is pleased to offer the following recommendations to the California Department of Toxic Substances Control (DTSC) for your consideration in developing and implementing the Cal-EPA Green Chemistry Initiative.</p> <p>Summary: The guiding principle for this proposal is that it relies on successful management of chemicals already in the marketplace according to their characteristics and actual uses, rather than simply banning substances. This focus recognizes the important difference between risk and hazard, i.e., that hazardous substances properly managed may not pose actual risks, and would create a system that is based on successful management of identified risks, as opposed to establishing prohibitions based on potential hazard.</p> <p>on behalf of the Bromine Science and Environmental Forum (BSEF)</p>
F-GC-57	<p>HIGHWAY MARKING PRODUCTS FROM CHINA: TOXICS IN PRODUCTS BY DESIGN Eureka! This term was used in the great Californian gold rush of 1849 and it has been shouted for the last several years in the boardrooms all across Corporate America. However, this time the rush is not to California but rather to China. A business can go to China, provide product specifications, and have the product produced and back in the US at much less expense than it would be to produce the product in the US. Why wouldn't a business do this? If you are with a publicly-traded company, you have to demonstrate quarterly that you are continuing to build shareholder value. So – Eureka! In order to build shareholder value, off to the Chinese gold rush we go.</p> <p>It sounded so good – much like it did to those who flocked to California in search of gold. So we did “go west young man, go west.” More accurately, today we'll “go east young business executive, far east.” In droves businesses have turned to China to stay competitive. In fact, it is very hard to find products that do not carry a “Made in China” label. Is there anything wrong with that?</p> <p>In the last few years, the ugly side of decisions to produce in China have been in the news. Widely communicated are Fisher Price and lead in toys for children, antifreeze in toothpaste and poison in pet foods. Almost daily there is a revelation that something from China is not exactly right and represents a risk to our health, children and/or well being. One issue revolving around a dangerous product from China has gone largely unnoticed. In the US and in a substantial part of the developed world, small glass beads are placed on highway markings to allow reflection of headlights (or any light) so you can see clearly when driving at night. Glass beads are a critical part of highway safety.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>Recently, as evidenced by this website, California embraced the “Green Chemistry Initiative”. This initiative is an appropriate evolution of America’s environmental movement. It combines the realization that chemistry is necessary to perpetuate our culture with the challenge that as we use specific substances, we must do so in the safest manner possible. Should the Government demand safe products on behalf of the public trust? Absolutely! So let’s turn back to glass beads placed on our highways as a way of making it possible to drive safely at night. Last year in California, more than 10 million pounds of glass beads were applied to highway markings. On a very positive note, the entire US glass beads industry uses recycled flat glass as a feed stock for this product. In fact, the US recycles approximately 1 billion pounds of waste industrial glass every year for use in glass beads. This is truly a success for the environmental movement!</p> <p>Like other American products, glass beads are now coming from China. Like the other products in the news, Chinese-produced glass beads used on our highways contain significant levels of lead and arsenic. Arsenic is a known human carcinogen and a poison, and lead was identified as unsafe decades ago in the US.</p> <p>Glass beads produced in the US do not contain dangerous levels of lead and arsenic primarily because of the good work of the EPA and OSHA over the last 3 decades. Unfortunately, there appear to be no regulatory bodies pushing the Chinese glass-making industry past the need to use arsenic and lead when making glass. So there you have it they use it and we don’t.</p> <p>Much like the wooden match industry in Europe, which was shutdown in about a year by cheap imports from China, if the Chinese take over the glass beads highway markings market causing the elimination of the glass beads industry in the US, what happens? This is an appropriate question because it is so much cheaper to produce the glass beads in China – no pollution controls, no workers compensation issues, no worker safety issues, no controls on poisons, etc.</p> <p>A couple of things happen if the Chinese dominate the glass-bead industry – things that are not desirable for California or the US. As previously mentioned, the US glass-beads industry is a recycling industry. More than 1 billion pounds of industrial waste flat-glass is recycled into glass beads for use on our highways each year. Last year, more than 12 million pounds (of the approximately 1 billion pounds) of waste flat glass was recycled from California alone. Should the US glass-bead industry go away, those 1 billion pounds of waste glass will end up in our US landfills. Further, if Chinese beads totally replace US-produced glass beads, recent sampling of Chinese glass beads suggests that 6 million pounds of arsenic and 3.4 million pounds of lead will be placed on our highways each year.</p> <p>The flood of imports from China has the potential to close a recycling-based industry, shorten our landfills’ life spans significantly, and place materials known to be toxic to humans on our highways all because these imports are cheaper! How is this “green chemistry”? The threat is real and it is here – the lowest bidder for the next two years to supply glass beads to CalTrans is a distributor of Chinese beads!</p> <p>If we are going to promote green chemistry, then let’s do it! A glass-bead product for highway markings from China is available and for a cheaper price, but you also could get significant levels of lead and arsenic in the product as a result. Another glass-bead product is domestically produced and does not contain dangerous levels of these heavy metals.</p> <p>The decision is easy. Sincerely,</p> <p>Ufuk Senturk, PhD Research and Development Manager</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-58	the crux of the matter lies in the fact that once out of the bag, "near slavery" will win every time....because its cheaper....with no control mechanism in place to regulate greed, the problem will only get worse....don't blame china, blame our corporate laws that even allow for consideration of the purchase of such items...drug dealers don't have a job unless there are junkies to buy the "stuff"....once one company is allowed to outsource jobs, buy cheap foreign goods, etc. the others will want to do the same so as to stay competitive....this ofcourse is the beginning of the end...it is not sustainable....and it has already been allowed to happen...if not promoted...the glass beads are just one of the many products that will be allowed to destroy one more sector of american production and jobs, and ofcourse allow dangerous chemicals in as well...at no other time in history has greed, apathy, stupidity and laziness converged in such a manner...people like to think happy thoughts...but they like their cheap goods better.
F-GC-59	Green chemistry is not regulation Green Chemistry is not regulation. It is innovation. It is continuous improvement by invention. It is more efficient, better working, higher value, less environmental impact. A set of Green Chemistry Principles already exists. California can further what is already accepted as green chemistry by removing barriers to innovation, funding green chemistry research and integrating green chemistry education into university chemistry curriculums. The state can't legislate creativity, but it can encourage it and become the cradle of practical green chemistry.
F-GC-60	Automated, Web-Based Assessment of "Green" Chemicals, Products and Processes for Procurement Rutgers University purchases thousands of chemicals and products for use in hundreds of buildings throughout our three campuses. We have implemented comprehensive acquisition processes to assure that the products we purchase are manufactured and distributed in compliance with all applicable laws and Rutgers standards. In the past six months, I have become aware of the Web-based "Green" Product Compliance Analytical System (GP-CAS) and the "Green" Process Analytical Compliance System (G-PACS) developed by Chemical Compliance Systems, Inc. (CCS). These two, quantitative, Web-based systems have been incorporated into a third party cleaning product certification program by the Chlorine Free Products Association (CFPA). Together, GP-CAS and G-PACS evaluate the entire life cycle of a product. Rutgers University is currently in discussions with CFPA and CCS about the possibility of incorporating these capabilities into our chemical and product acquisition processes. California may find these existing Web-based capabilities applicable to the objectives of your Green Chemistry Initiative. They certainly have the potential to achieve a voluntary product certification program that could increase the application of available chemical hazard information in a way that reduces labor and cost requirements for both the State and industry, while increasing the protection of the public and the environment.
F-GC-61	Public Participation in GCI Science Advisory Panel meetings Re: Public Participation at Green Chemistry Initiative Science Advisory Panel meetings As a member of the NGO community tracking the development of the Green Chemistry Initiative (GCI), we have recently learned of the debate within the GCI Science Advisory Panel (SAP) about whether the SAP meetings should be open to the public. I will confess to you I was somewhat shocked to hear that this was even a topic for discussion. The success of the GCI will depend on many things, but one of the most crucial in our view is a transparent and open process that fully involves all stakeholders. Indeed, the GCI has been consistent in its messages to date welcoming input from all quarters. Why would you now propose to meet behind closed doors? If you hope to build a robust network of supporters for the GCI, which we believe is critical, then conducting open meetings of the SAP with opportunities for public input and comment is an essential building block. I am convinced that the great majority of public interest organizations, not to mention the public itself, feels the same way. We are concerned that without a strong commitment to an open meeting process that welcomes participation from all, the GCI will severely damage its credibility and undermine its chances for success before it makes a single proposal about green chemistry. We have already submitted comments about the GCI as a signatory to the letter from Californians for a Healthy and Green Economy (CHANGE). Founded in 1976, Commonwealth is a nonprofit health and environmental research institute in Bolinas, California.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
	<p>Yours truly, Davis Baltz Commonweal dbaltz@igc.org 510 848-2714</p>
F-GC-62	<p>Dow Chemical's Comments on Educational Programs The Dow Chemical Company (Dow) is pleased to provide the attached paper on the role educational programs could play in California's Green Chemistry Initiative (GCI). We have appreciated the open, collaborative environment utilized for this process and have taken advantage of opportunities to participate in a variety of ways. Attached is a brief paper on educational programs where Dow has been engaged with the objective of improving science education and understanding of sustainability. This is intended to catalyze DTSC's thinking about the role education can play and the types of programs to consider. Dow believes that education must play a key role in California's Green Chemistry Initiative for the effort to reach its full potential.</p> <p>on behalf of the Dow Chemical Company</p>
F-GC-63	<p>Thoughts on a Framework for Green Chemistry The Consumer Specialty Products Association's California Green Chemistry Principles</p> <p>Belief Statement: CSPA members are committed to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers.</p> <p>Background:</p> <ul style="list-style-type: none"> • CSPA member products improve the quality of human life and are necessary to protect the public health against dangerous diseases, infestation, and unsanitary conditions. • CSPA members are committed to providing products that are thoroughly evaluated for human and environmental safety and go through rigorous safety-based assessments before they are brought to market. • CSPA members are committed to clear and meaningful labeling on consumer products, i.e., label instructions are written to ensure that consumers use products in accordance with label instructions. • CSPA members are committed to the development of green products that are safe for human health and the environment. CSPA members routinely apply green chemistry and green engineering principles in their operations and have been honored with awards for their efforts. • The consumer products industry develops products that meet or exceed safety requirements of all state and federal agencies in the United States and Canada charged with regulating those products, including the California Department of Pesticide Regulation, the California Air resources Board, and other state agencies, U.S. Consumer Product Safety Commission (CPSC), the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the U.S. Food and Drug Administration (FDA), Health Canada, and Environment Canada. <p>CSPA Supports:</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>1. CSPA supports initiatives that continue to foster innovation and encourage universities, educational institutions, and industry to partner in developing effective “greener” ingredients that reduce environmental impact.</p> <p>2. CSPA supports company performed safety-based assessments of consumer products prior to the marketing of a product, that take into consideration all of the phases of a product’s life-cycle.</p> <p>3. CSPA supports a chemicals management program based on sound scientific risk assessment to protect human health and the environment.</p> <p>4. CSPA supports appropriate use-restrictions for chemical ingredients when scientific safety-based assessments indicate that they cannot be used safely in a consumer product or use application.</p> <p>5. CSPA supports initiatives among companies, government, and interested parties to promote consumer awareness of the importance of reading and following label instructions for safe product use, storage, and disposal.</p> <p>6. CSPA supports collaborative efforts to encourage public and private partnerships with the goal of developing “greener” products and “environmentally responsible” ingredients rather than mandatory and voluntary state labeling programs that endorse green products or programs that stipulate a single third-party certification of green products.</p> <p>7. CSPA supports initiatives that provide incentives for companies that innovate and develop technologically and commercially feasible products using green chemistry.</p> <p>8. CSPA supports research that identifies opportunities for the use of green chemistry in consumer products and also supports policies designed to overcome barriers to commercial application of green chemistry research and development efforts.</p> <p>9. CSPA supports recognition for companies that develop sustainable business operations, processes, and/or products.</p> <p>Essential Green Chemistry Program Principles:</p> <p>1. Green chemistry should ensure the safety of consumer products through the use of sound science in the decision-making process.</p> <p>2. A green chemistry program should be designed with guidance from all stakeholder interests.</p> <p>3. A green chemistry program should be designed to promote products which are technologically and commercially feasible to produce.</p> <p>4. Green chemistry must foster innovation and not limit the development of new chemistry technologies.</p> <p>5. A green chemistry program must ensure that product efficacy, performance, and usability are not compromised or undermined.</p> <p>6. A green chemistry program should build on existing statutory and regulatory structures, voluntary initiatives, and data development efforts.</p>
F-GC-64	<p>Stimulating Green Chemistry</p> <p>“Green Chemistry” is an intellectual framework that aligns technology innovation with improvements in the health and environmental “footprint” of materials used in our society. It requires inter-disciplinary collaboration among a variety of experts in chemistry, toxicology, and environmental science that work in business, government, and academia. Government cannot, and should not, dictate by statute or regulation precisely how this process for innovation and collaboration should occur.</p> <p>Importantly, a “Green Chemistry” program, in and of itself, should not be picking “winning” or “losing” products. Instead, it should be removing barriers and creating objective tools to allow companies to create new products and enable consumers to recognize and choose them. According to a March 28, 2002, publication of the Organisation for Economic Co-operation and Development (OECD) (of which the United States is a member) entitled, “Need for Research and Development Programmes in Sustainable Chemistry” (available at http://www.oecd.org/dataoecd/9/55/2079870.pdf), “For government, sustainable chemistry is a non-regulatory way of making regulations work more effectively.” OECD at 15.</p> <p>Member companies of the American Chemistry Council (ACC) are leaders in Green Chemistry and Green Engineering in their operations and have been honored for their efforts (e.g., see http://www.epa.gov/greenchemistry/pubs/pgcc/past.html for a list of EPA Presidential Green Chemistry Challenge</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>winners). Our members view both the American Chemical Society's (ACS) Green Chemistry Principles and the ACS Green Engineering Principles as useful approaches to resource efficiency, pollution prevention, and safety. These principles, however, were never intended to be applied as government mandates. In fact, prominently displayed on the home page of the Green Chemistry Institute is the statement: Green Chemistry differs from previous approaches to many environmental issues. Rather than using regulatory restrictions, it unleashes the creativity and innovation of our scientists and engineers in designing and discovering the next generation of chemicals and materials so that they provide increased performance and increased value while meeting all goals to protect and enhance human health and the environment. So, how can California encourage Green Chemistry rather than attempt to mandate it? Several actions may be taken to stimulate Green Chemistry in California and the United States broadly. For example, government can and should provide encouragement for Green Chemistry collaborations through the sharing of expertise, financial support for research, information exchange, and public education. In fact, a variety of federal agencies (including EPA and DOE), companies, professional associations such as ACS, Non-Governmental Organizations (NGO), and universities are already working together to encourage Green Chemistry strategies. Additionally, government should consider offering incentives for companies to pursue and foster Green Chemistry and Green Engineering to help ensure these products/technologies can become economically viable and gain initial access to a competitive marketplace. These incentives might include tax incentives, low interest loans, awards, and marketing exposure.</p> <p>I. Education and Research/Development Industry is always working to drive down production costs. For specialties and fine chemicals, the synthetic chemists working in developing these materials have to know how to ask the Green Chemistry questions. This stands squarely in the realm of science education, especially in schools of chemistry. Not only do chemists and others involved in chemistry need to understand toxicology, but they also need to better understand the interaction between health and environmental protection, toxicology, and price. It is therefore essential that California support education in the methods and principles of Green Chemistry for all its state colleges and universities (and in its high schools and vocational schools, as appropriate). Anywhere that chemistry is taught, toxicology and Green Chemistry should also be taught. Additionally, California should encourage innovative research in Green Chemistry and Green Engineering. Research funding into new Green Chemistry methods is always welcomed by colleges, universities, and others, and should be an important part of any Green Chemistry program. According to the OECD (again referring to their March 2002 publication): Governments can promote sustainable chemistry R&D...by establish[ing] and fund[ing] programmes on sustainable chemistry R&D. ... In addition, parts of industrial programmes are often supported by government funds. Governments, in general, can provide funds for basic and pre-competitive research. ...Practically, governments can orient sustainable chemistry R&D programmes by adjusting the distribution of funds for fundamental and applied research or by commanding competitive and targeted funds depending on policies. OECD at 15.</p> <p>II. Incentives To further stimulate Green Chemistry and Green Engineering, California should consider the following incentives: (1) awards like EPA's Green Chemistry Challenge (see http://www.epa.gov/greenchemistry/pubs/pgcc/presgcc.html for more information); (2) tax incentives/subsidies/grants/low interest loans for research and development; and (3) marketing exposure for Green Chemistry processes and products. For example, when California purchases chemicals for state contracts, it could decide to pay a modest premium for a set period of time for new "green materials" that show promise. The goal of this subsidy would be to help a new material achieve greater economies of scale, but avoid locking in an inefficient permanent subsidy. California could additionally make capital available to companies at preferential terms, whether via grant or lower interest</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>loans, to encourage Green Chemistry and Green Engineering manufacturing process development. And California could also consider a marketing program (perhaps akin to the "California cows" and dairy ads currently on television) whereby the state would promote companies that are actively engaged in Green Chemistry and Green Engineering, and products that are the result of Green Chemistry and Green Engineering.</p> <p>The OECD suggests: [G]overnments can facilitate the consideration and application of sustainable chemistry R&D by supporting efforts which aim at educating and informing industry and the general public of the importance and benefits of sustainable chemistry. One possible role for government would be to identify incentives and disincentives for the promotion of sustainable chemistry and to use this information to modify or develop their policies accordingly. When appropriate, the use of incentives, such as a reduction in taxes or the use of subsidies, can be an effective way of supporting R&D by academia and industry in the field of sustainable chemistry. ... It is essential that any sustainable chemistry technology or product be competitive in the marketplace, at least in the long term. However, some of those technologies, even if they are beneficial in the long term, will not be able to survive economically without incentives. Economic incentives, such as subsidies or tax reductions, could be effective in these cases. OECD at 15 and 17.</p>
F-GC-65	<p>A Modern Chemicals Policy For California CALIFORNIA MEDICAL ASSOCIATION A MODERN CHEMICALS POLICY FOR CALIFORNIA (2007) Introduced by: San Francisco Delegation</p> <p>Whereas, the state, national, and global scale of industrial chemical production is immense and is expected to grow four-fold by 2050, and the chemical industry is an important industry with wide contributions to health and human development; and</p> <p>Whereas, ever-expanding research confirms that many chemicals that are useful to society are also known to be hazardous to human biology and health, particularly in utero and in developing children; and</p> <p>Whereas, for new and existing medications, the Food and Drug Administration has long required pre-approval evaluation of safety as well as efficacy, and many industrial chemicals with known impacts on human biology are present in human bodies at levels similar to active doses of medications; and</p> <p>Whereas, numerous other nations including Canada and the European Union are adopting more proactive health-oriented chemicals policies, based upon scientific knowledge, assessment, and accepted public health principles; and</p> <p>Whereas, there are long-standing deficiencies in the federal regulation of industrial chemicals, most notably in the Toxic Substances Control Act (TSCA), as confirmed by the National Academy of Sciences and others, and the University of California documented in a 2006 report to the California Legislature that TSCA's deficiencies are important and can be remedied; and</p> <p>Whereas, these problems include the projected appearance of 600 new hazardous waste sites each month in the U.S. over the next 25 years; the appearance of hundreds of industrial chemicals in human tissues and fluids, including those of infants; and the development of chronic diseases caused by chemical exposures on the job among 23,000 California workers each year; and</p> <p>Whereas, the American Public Health Association's leadership has recently endorsed a policy titled "Calling on the U.S. Congress to restructure the Toxic Substances Control Act and implement a modern, comprehensive chemicals policy", to be considered for adoption at the annual APHA meeting in November; Therefore, be it</p> <p>Resolved: That the CMA calls upon the State of California and United States to implement a modern, comprehensive chemicals policy in line</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>with current scientific knowledge on human health, and which requires a full evaluation of the health impacts of both newly developed and existing industrial chemicals now in use; And be it further RESOLVED: That this matter be referred for national action (AMA). REFERENCES: http://www.healthandenvironment.org/science/papers on behalf of the California Medical Association</p>
F-GC-66	<p>Check out This Tool that Will Work!!! Last week I attended the Western Regional Pollution Prevention conference in San Diego and had a chance to see a demo of a software tool that would be incredibly effective in addressing some of the concerns here. In fact I understate my excitement because it is so eye-popping to see to see the software in action, I can only hope to do it justice here. The software is very sophisticated but unlike other solutions I've seen, this one is actually very user friendly. It is the first real tool I've seen that can be used by industry experts, academia and the general public. Wow, let me say that again...the general public can actually use this tool it is that user friendly. The implications for Compliance Managers, Risk Assessment Departments and Purchasing agents are enormous. In addition to these individuals who must regularly make decisions that affect their organization, colleagues, and communities, there are also many in the medical profession, biotech, agriculture, ecologists and yes even economists (!) can plug in use this tool to get the results they need. Those of us posting here can dig into the inner workings of the software, because behind the easy-to-use interface is a complex, meticulous database that has been so well tested and refined that it is virtually bulletproof with respect to passing peer-based reviews. Dr. George Thompson has spent 25 years creating a chemical database of 75 million data elements for more than 210,000 chemicals, 350,000 products compiled from over 1,000 sources. His software can generate a score that can accurately and effectively measure the toxicity levels in a given chemical recipe, process, or product and give specific information about the impact on Health, Safety and Ecology. Not only that, it is possible to cross reference information regarding the chemicals, CAS numbers, regulatory lists, (very exciting!) and can eliminate redundant data so that it's easier for departments to work together and get things done faster. There is much more detail that I can go into, however what's more important is that you, as you're reading this, get curious enough to check out Dr. Thompson's tool. It is worth the time to take a look, and even more than that, I would be thrilled to see the technology implemented as part of California's comprehensive solution. For this reason, I'm getting the word out on the other forums too. We need to be looking at this solution. There is no more time to wait. We must involve people at the business and community level. We must give people at the business and community level a tool that will work for them. No just us. Check out www.chemply.com</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	Read more about this man's work. It is phenomenal!!!!!!
F-GC-67	<p>Product Stewardship Innovation and Environmentally Friendly Technologies Airgas, Inc., the largest U.S. distributor of industrial, medical, and specialty gases, and hardgoods, such as welding equipment and supplies, and the second-largest manufacturer and distributor of liquid carbon dioxide in the United States is committed to product stewardship innovation and to promoting environmentally friendly technologies. This is why we have long advocated the use of refillable refrigerant cylinders in servicing mobile air conditioning systems as well as stationary industrial, commercial, and residential refrigerating and air conditioning systems. Airgas led the industry in the late 1990s by introducing a 30 lb. refillable refrigerant cylinder to replace the standard size 30 lb. disposable cylinder. The use of refillable cylinders for refrigerants eliminates the emission of ozone depleting compounds and greenhouse gases remaining in disposable containers when they are discarded. Recognizing their significant environmental benefits, most developed countries, including Canada, the EU Member States, and Australia, have already banned the use of non-refillable cylinders for refrigerants. In addition to its atmospheric benefits, decreasing the number of cylinders discarded each year can also save tens of millions of pounds of steel (fostering conservation of an important natural resource) and hundred of thousands of cubic yards of landfill space nationally each year.</p> <p>The use of carbon dioxide (CO₂) in environmentally friendly technologies is another area that Airgas strongly supports. With growing concerns over the environment and global climate change, and increasingly stringent regulatory requirements, companies are actively searching for alternatives for many of the coolants, solvents, and other chemical substances they currently use, which will be greener and have a smaller environmental footprint. The distinctive properties of CO₂, combined with its environmental benefits, make it a cost- and performance-effective green alternative for other chemicals used in many industrial and commercial processes. Although CO₂ is a greenhouse gas (GHG), it is generally obtained commercially as an industrial by-product from existing operations and, therefore, its further use in other industrial and commercial processes and operations does not make any further, or additional, contribution to global warming.</p> <p>The unique lubrication and cooling qualities of CO₂ are the reason it is seeing increased use as a coolant / lubricant, in industrial machining operations. Its use in these applications doesn't generate any hazardous waste compared to the disposal of hazardous cutting oils and biocides typically used in metal machining, which is significant when considering the cumulative environmental waste from the myriad of machine shops. In metal machining applications, CO₂ delivers considerable economic benefit via increased productivity and tool life, hence indirectly reducing consumption of other natural resources. In addition to being environmentally friendly, the use of CO₂ eliminates worker exposure to many of the hazardous chemicals used in the machining industry today.</p> <p>Dry cleaning is another area where use of by-product CO₂ provides an especially attractive, environmentally preferable, alternative. With pending regulation, perchloroethylene (Perc) in commercial dry cleaning operations is being replaced in California by alternative technologies. Hydrocarbon or petroleum-based solvents are currently the most popular choice when replacing Perc equipment. However, their environmental profile raises some concern, plus their cleaning performance is very limited as petroleum based solvents do not clean water based stains, which make up the bulk of stain types on clothing. Use of hydrocarbons is controversial because it increases Volatile Organic Compound (VOC) emissions. VOC emissions contribute to the formation of ozone in the lower atmosphere. Ozone has been linked to a variety of health effects including respiratory irritation, asthma, and premature death. Moreover, the environmental persistence of hydrocarbon solvent mixtures is mostly unknown and has the potential for contamination of soils and drinking water.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>Carbon dioxide is non-flammable and non-toxic. Unlike Perc and hydrocarbons, waste disposal is not an issue with carbon dioxide dry cleaning systems as any waste generated is not classified as hazardous. Also, it is a win-win for customers as it can be used for cleaning sensitive articles like silk, linen, and leather and can extend the life of garments due to a less aggressive, gentler process, thereby conserving resources for textile manufacture (an environmental benefit through reduction in resource consumption).</p> <p>In addition to being environmentally preferable to Perc and the alternative hydrocarbon-based systems, carbon dioxide is a commercially and economically viable alternative. The higher capital purchase cost of a CO₂ system can be offset by lower operating costs, improving its economic competitiveness. Short cycle times lead to higher throughput, improved productivity, and lower labor costs. Also, waste management costs are eliminated since process wastes are not considered hazardous.</p> <p>Airgas believes the concept of using by-product CO₂ for dry cleaning is an excellent example of product stewardship innovation - one that warrants enhanced, innovative incentives to expand its use more quickly as a Perc replacement. Although financial assistance (\$10,000 grants) for the dry cleaning industry to switch from Perc to non-toxic, non-smog forming alternatives like CO₂ and water-based cleaning systems is offered in California's proposed legislation (AB 998), it may not be sufficient for small businesses to purchase a CO₂ system which costs significantly more than alternative hydrocarbon systems. However, as more CO₂ units are installed, the cost of the systems would be expected to continue to decrease.</p> <p>The State of California, by taking a leadership role in Green Chemistry and sustainable technologies, can foster broader stewardship and encourage further innovation through development of creative incentives for environmentally friendly technologies like refillable cylinders for refrigerant gases and CO₂ for dry cleaning and metal machining.</p>
F-GC-68	<p>Thoughts About Substitution</p> <p>Contributions from chemistry bring many benefits to society, but there are chemicals which can pose risks to health or the environment in certain circumstances. Some argue that the most sensible approach to these chemicals is to replace them with substances considered less hazardous—a seemingly simple concept, but substitution is not always feasible and not always the right choice. American Chemistry Council (ACC) members, through Responsible Care®, regularly consider substitution as an option in their broader green engineering and process design efforts. When doing so, companies must closely examine the implications for the safety, functional performance, and cost of alternatives to avoid ineffective changes with unintended negative health and environmental impacts.</p> <p>A good cook knows that you cannot arbitrarily change ingredients in a recipe. Whole wheat, rye, all purpose, and pastry are just a few of the many different varieties of baking flour. Yet, bakers know that while all flour is similar, many cannot be substituted without creating a result nobody would want to eat. The same holds true for chemical processing. You cannot simply replace one chemical ingredient for another without impacting the final product. Therefore, significant problems would result if chemical substitution were mandated as the solution of first choice without careful consideration of potential consequences. This is very much the approach taken by an international group of experts to the Intergovernmental Forum on Chemical Safety (IFCS) earlier this year in talking about “informed substitution”. (see the background elements of the IFCS paper available at http://www.who.int/ifcs/documents/forums/forum6/12_original_prop.doc)</p> <p>SUBSTITUTIONS MAY CHANGE THE NATURE OF THE PROBLEM RATHER THAN SOLVE IT</p> <p>Mandatory bans and forced substitutions often are not a complete solution because, as one issue is addressed, another set of concerns may arise. This is the difference between “informed substitution” and “regrettable substitution”, with the goal of “informed substitution” being to avoid “regrettable substitution”. For example, the health and convenience of our lives has been greatly enhanced by modern refrigeration. Refrigerators originally used ammonia, a toxic chemical, as a coolant. As scientific discoveries were made, chlorofluorocarbons (CFCs) replaced ammonia. While CFCs are practically non-toxic, they were later implicated in depleting the ozone layer and eventually banned. CFCs were then replaced with hydrochlorofluorocarbons (HFCs),</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>which have no impact on the ozone layer, are non-flammable, have low toxicity, and high energy efficiencies. Scientists have now learned that HFCs could contribute to global warming if released into the air. Alternative coolants such as hydrocarbons and carbon dioxide have been considered, but both need to be carefully examined because of the potential for emissions and the possible dangers from higher operating pressures.</p> <p>In another example, consider the Peruvian government's decision to stop chlorinating drinking water. The result in 1991 was a five-year epidemic of cholera which spread to nineteen Latin American countries, causing more than one million illnesses and 12,000 deaths. After the outbreak, U.S. and international health officials criticized Peruvian water officials for not chlorinating the entire water supply. An official with the Pan American Health Organization (PAHO) blames the inadequate chlorination, at least in part, on concern over disinfection byproducts. In a 1997 article in the Journal of the American Water Works Association, Horst Otterstetter states, "Rather than being abated by increased use of chlorination, the waterborne transmission of cholera was actually aided because of worries about chlorination byproducts."</p> <p>Substituting one material for another is never as simple or straightforward as it might at first appear.</p> <p>SUBSTITUTIONS MAY RESULT IN UNINTENDED ADVERSE CONSEQUENCES</p> <p>Trading in a fuel-hungry SUV for a moped may address energy efficiency concerns, but it's probably not a reasonable option for a mother of four. Like the moped, forced substitution, without full consideration of the potential impacts, is impractical and unwise. For example, some substitute chemicals require higher processing temperatures and greater pressure conditions in order to achieve the same result as the original chemical. Additionally, if the substitute chemical is not compatible with the processing equipment, it can cause break downs or failures. In some circumstances, the substitute is not as effective as the original chemical and more quantity must be used which results in larger amounts of waste materials and increased waste disposal management and risks. All of these factors can lead to increased safety concerns for the worker population, as well as increased energy consumption by the company. This unintended consequence of substitution was clearly demonstrated in Europe when energy companies decided that fuel derived from plants would be more environmentally friendly than fossil fuels. Those companies developed specialized generators for palm oil, which increased demand. To keep up with that demand, palm plantations cleared large tracts of land by draining and burning peat land, resulting in huge carbon emissions into the atmosphere. The production of the plant derived fuel had an unintended consequence of creating more harmful emissions than the fossil fuels they were intended to replace.</p> <p>SUBSTITUTION IS NOT THE ONLY VIABLE APPROACH TO CONTROL RISK</p> <p>The principle of risk reduction is and always has been part of the normal day-to-day operations for the business of chemistry. Industry's ability to innovate allows us to respond to society's evolving needs for better, safer products.</p> <p>Beyond substitution, the chemistry industry considers many other options to minimize potential hazards, such as operational management systems, engineering controls, modifications to the chemical product, and waste management innovations. The industry also provides specialized consumer training and works with communities to implement effective recycle/reuse programs. Through ACC's Responsible Care® initiative, ACC member companies go above and beyond government rules and regulations to continuously improve their environmental, health, safety, and security (EHS&S) performance. ACC members employ a rigorous EHS&S management system that is certified by third-party auditors. Among numerous other elements, auditors verify that our companies have systems to manage risk associated with chemical products including management of product development, transport, use, and disposal in a safe and secure manner. Companies are also audited on their programs to protect the environment and to conserve resources, as well as their efforts to dialogue with community stakeholders about the organization's impact on human health and the environment. Company performance under Responsible Care® is publicly shared through americanchemistry/responsiblecare.com. For more information on Responsible Care®, please visit http://www.responsiblecaretoolkit.com.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-69	<p>mike i actually agree with you on this one.. lets take my field of specialty for example.... oil based polyurethanes were the predominant finish for quite some time....voc mandates came along and forced industry change, industry then introduced poly functional aziridine, isocyanates, nmp etc. to create low voc water formulas....and while that's great for emissions, evidence is inconclusive regarding the health effects of those that use them....not that the oil base is great for you to obtain "the magic bullet" {the replacement} for each compound that needs replacement is one thing, understanding the psychology of why a certain compound is being used is another needs, wants, improvements, this is the basis for chemistry's promotion. take cfc as a propellant as a replacement for ammonia...why was a propellant used in the first place? virtually any fluid can be dispensed with a pump spray head {made from plastic :} } i believe the consumer considered holding down a button vrs. pumping it several times was a "need" that needed fulfilling. or in other words people are too lazy to pump there finger to dispense a product vs using a chemical to spray it out for them.... and or who gave them the option and why?....the application was conceived..."we need to spray this stuff out of this can"....chemistry came up with a solution{that's what we do} and sold the "need, want and convenience to the unsophisticated general public who is only concerned with simplifying their lives, who in general was not concerned or aware that certain chemical compounds were and or are harmful to them or the planet water /air.... to what cost are we willing to exchange convenience for destruction....our Pavlovian habits regarding chemicals and there acceptance to replace old compounds or physical labor are the root of the issue. lets take junk mail for a minute.....who likes their junk mail.....anyone.....common you guys know you love sifting through 25 junk letters to get to the two bills you actually need out of the stack of mail.....right.... well lets just say one had authoritarian power and could lay down mandates on society.... and lets just say you were going to mandate the elimination of junk mail....punishable by large fine and imprisonment.... so the junk mail stops....those that don't like sifting it will rejoice.... then there's the other side... those that proclaim the right, in a free society, their right to free market advertising...they would not like it then there's the paper manufactures and all the chemical compound supply companies that would not like it... and then there's all the printing ink companies...they would not like it all the delivery services they would not like it and then the recyclers they would not like it... so we have several jobs now effected as well as several raw material suppliers effected in this chain of events the mandate lays down... the questions....would it be worth it...do we need to waste these raw materials, do we need to produce and use all this ink, do we need to use all this fuel transporting and recycling this stuff?.....do we need it..or is it just perceived as the way it is with too many peoples lives effected by such a mandate? how did we get to the point of acceptance of such a thing as junk mail...why is it considered ok... again my point is that many of these perceived needs, wants, replacements are convenience based.....people have been encouraged to accept these improvements based on simplifying or improving their lives....there are several of these improvements that are trivial and should not have been allowed to be implemented in the first place, primarily based on consumer ignorance and or acceptance and industry greed. there are several examples such as junk mail that relate to chemical usage....usage relates to formulation in many respects. while the directive of the program here seems to be related to green chemistry, i would remind people that our usage habits and the understanding of the</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
	<p>psychology of how things have become the way they are regarding usage is just as important to reducing, using and wasting chemicals as eliminating certain ones October 29, 2007 jesse goldstien oh' and furthermore.....you would agree that if a benign substitute were to be derived as a replacement....with none of the peripheral side effects you give as an example...that it should be encouraged as a replacement?....i assume?</p>
F-GC-70	<p>oh' and furthermore.....you would agree that if a benign substitute were to be derived as a replacement....with none of the peripheral side effects you give as an example...that it should be encouraged as a replacement?....i assume?</p>
F-GC-71	<p>CHANGE's Perspective on a Successful Program We write to you today on behalf of CHANGE, Californians for a Healthy and Green Economy. Ours is a broad-based growing coalition of approximately 35 environmental and environmental justice groups, health organizations, labor advocates, community based groups, parent organizations, and others who are concerned with the impacts of toxic chemicals on human health and the environment, as well as the lack of a regulatory framework that seeks to prevent exposures to toxic chemicals. We thank you for your leadership initiating the Green Chemistry Initiative and would like to take this opportunity to join the Conversation with California by offering our perspective on what would make the program successful in addressing the critical human and environmental issues related to chemical use.</p> <p>on behalf of CHANGE</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-72	<p>Dow Chemical's Green Chemistry Thoughts</p> <p>The Dow Chemical Company (Dow) is pleased to provide the following comments on California's Green Chemistry Initiative (GCI). On June 29, 2007 Dow provided initial comments that represented our principles for sustainable chemistry at a corporate level. That letter spoke of Dow's accomplishments in sustainability, Dow's aggressive 2015 Sustainability Goals, and Dow's suggestions for framing California's GCI. We have engaged fully in the DTSC's process; Dow people have spoken at two of the three Green Chemistry Symposia and have participated in the workshops, including serving as break-out session facilitators.</p> <p>This current submission offers Dow's more-detailed thoughts in the specific areas of:</p> <ul style="list-style-type: none"> § Life-Cycle Assessment § Eco-Labels § Consumer Choice § Environmentally-Preferred Purchasing § Incentives <p>on behalf of the Dow Chemical Company</p>
F-GC-73	<p>Time may not be on our side.. Green Chemestry Idea..</p> <p>The ideas I am describing below may seem to you to be more of an applied scientific/research issue combined with the need for advanced engineering, modeling and simulations to solve the problem (abstract written by me as if the theoretical scientific issues had already been resolved / matured). As a native of San Diego and a Tau Beta Pi Engineering Graduate of the University of Illinois, it (the discussion below) by me is really the only reference frame from a professional scientific standpoint that I currently have to communicate these thoughts. (It may appear to you to be written more in the form of a requirement than an abstract).</p> <p>So I hope you will bear with me on this and also feel free to provide any comments back to me, as you set fit. If these ideas seem far fetched to you, then I apologize. However, I am not sure the exact leading edge of the state of the art of research in this particular arena.</p> <p>Sincerely, Leslie M. Millholin III</p> <hr/> <p>Background discussion: I have heard a lot of interesting ideas bantered about these past few years to deal with the issues associated with climate change and global warming. However, I am now not sure that time is on our side, that is, to first become carbon neutral and to then start reversing the effects of excessive CO2 in our atmosphere.</p> <p>Now, thinking back to the turn of the (20th) century, a little over 100 years ago today. What would be the result then if you talked to the average person of that day about semi-conductors or quantum physics? Well, their reaction would probably be, "What good is that?.. we (people of the 1900's era) know about conductors and insulators, but a semi-conductor?"</p> <p>Again, if you talked to folks of that era about quantum physics, they would probably respond back in the following manner: "We today (in 1900) understand what Sir Isaac Newton was trying to tell us. But a new science field of quantum physics? What good would that be?"</p> <p>So, fast forwarding 100 years to today, we could extrapolate this discussion and focus it into the paradigm that I am trying to describe here.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>Technical discussion/abstract: To begin with, if in the near future, we had a new advances in the area of "integration of the ecological, economic and social drivers of biodiversity change", that is "bio-sustainability" to leverage, then I believe this would make mankind's existence of this planet compatible with the thought of having a less destructive effect on our ecosystems. The idea for 'bio-sustainability' means basically to me as I view the future, "advanced biotechnology with other non-natural sciences factored in to the equation".</p> <p>Thus, giving one possible real world example of how to proceed with this endeavor, we could leverage work done in the area of bio-degradable materials, as well as your areas of on-going research. It could then be possible to develop a new set of 'semi-organic' materials, not dissimilar in their process of creation, but possibly a reverse process to the creation of bio-degradability, that is, the known formula for making bio-degradable products (such as bio-degradable DDT, more commonly know as the pesticide pyrethroid), again as one possible example/postulation of how to proceed with this idea. So we have (once the science and engineering is resolved) a new set of 'semi-organic' materials that are really not alive, per se, but still maintain all their present non-organic properties. However, they would also have the ability to absorb CO2 directly from the atmosphere. To follow on with this thought/technical thread and also to start thinking about some of their possible future uses, if we quickly review some of the current day common building and construction materials which may include but are not limited to the following: Stone, rock, cement, steel, composites, adobe, concrete, asphalt, copper, aluminum, stucco, glass, hay bales, fiberglass, ceramics, tin, plexiglas, brick, plastics, wood, hybrid construction materials like new winterized road surface emulsions which contain embedded anti-freeze compounds, that is winterized road paving with antifreeze admixtures (e.g., residue from dressing bauxite is mixed with NaCl (calcined bauxite) and ground; polyurethane foam is ground and mixed with CaCl.sub.2 ; a silicon organic compound and quartz powder is added to one or both of the ground mixtures; the grains are embedded in bituminous material or asphalt to be used for making a surface road, being protected against frost by these salts) etc... Reviewing this list of materials, it then becomes obvious that the technology for multi-purpose, multi-function construction materials is already progressing at a fairly fast pace, but with the intended purpose of mitigating some of natures most un-wanted effects. Now if mankind is to truly co-exist with nature in a more bio-friendly way, then I think consideration of the possible advance to the bio-sustainability arena I have postulated above, which, if scientifically possible, could at least partially replicate the natural photosynthesis process and therefore, eliminate or reducing the need for larger, more cumbersome scientific and engineering solutions for producing the same CO2 mitigation effect/results within our earth's atmosphere. Therefore, I believe this abstract should be given serious consideration as a possible means of CO2 reduction in our atmosphere. I know most CO2 mitigation studies and scientific concepts are today focused on the upper atmospheric regions and above, however this abstract focuses on a unique 'ground-level' solution to offset the current and on-going climate change effects to our planet and its atmosphere.</p> <hr/> <p>Conclusion: The idea here overall would be to research, engineer, design and manufacture a set of 'semi-organic' set of materials that would eventually take the place of the traditional building and construction materials that I have listed above and then use these as replacement materials while at the same time having them absorb CO2 directly from the atmosphere in addition to their existing functions/properties/roles. Exploring this possibly complex new area of science and engineering endeavor may require extensive collaboration with the scientific community as well as academia, the construction industry, and many of the major engineering builders of today's society.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-74	<p>Chemistry is Essential To California Chemistry is essential to California. When the science of chemistry is applied, it helps make the lives of Californians and others throughout the world safer, healthier, and more productive. American chemistry also plays a fundamental role in helping the California economy be more energy efficient. Our products go into modern materials used to make insulation, weatherization equipment, firefighting and other emergency response equipment, lightweight vehicle parts, coatings, lubricants, and energy-efficient appliances. ACC members are proud to be doing our part to reduce greenhouse gas emissions and intensity and improve energy efficiency. In fact, we've improved energy efficiency by 46 percent since 1974 and reduced absolute greenhouse gas emissions by 10 percent since 1990 – exceeding the Kyoto Protocol's target and deadline.</p> <p>In addition to the 84,802 jobs directly created by the chemical industry in California, a total of 524,584 jobs in California are generated indirectly by chemical industry activity in California and other states. For every chemical industry job in California, a total of 4.5 jobs are created within the state, a total of 300,627 jobs. In total, 609,386 jobs in California are supported by the chemical industry. These jobs generate \$30 billion in earnings and \$1.7 billion in state and local tax revenues.</p> <p>Industries that use chemical or chemical-derived products include: farming, new residential construction, emergency response services, plastic bottle manufacturing, upholstered furniture manufacturing, dry cleaning services, building services and health care, to name just a few. In California, more than 4.9 million jobs (or 31.8% of all California jobs) are dependent on chemical products. These jobs generate \$230.8 billion in earnings and generate state and local tax revenues of \$13.4 billion.</p> <p>The principles of sustainable chemistry are at the heart of our everyday business of producing chemical products. ACC member companies incorporate Green Chemistry and Green Engineering in their operations, and have been recognized for their efforts; having won 9 Green Chemistry Challenge Awards issued annually by the US Environmental Protection Agency.</p> <p>For California, American Chemistry is essential to producing the products, jobs, and innovations that will help us achieve a more sustainable future.</p>
F-GC-75	<p>American Chemistry Council President and CEO Jack Gerard expressed deep regret that California Governor Schwarzenegger chose to sign a bill banning certain phthalates from some toys and childcare articles, but expressed the hope that the act would not imperil the state's future plans for addressing chemical health and safety issues in a rational and science-based way.</p> <p>"This law is the product of the politics of fear. It is not good science, and it is not good government," said Gerard. "Thorough scientific reviews in this country and in Europe have found these toys safe for children to use. California businesses will now be obliged to take products off the shelves that their customers need and want."</p> <p>"Next year, we hope that policy makers and special interest groups will abandon their chemical-by-chemical, attack strategy and put their support behind the state's Green Chemistry Initiative. Public health and safety is best protected by decisions driven by the experts, and based on the evidence." Though positive carcinogenic findings exist, negative findings have appeared in tests with several species. Thus, the actual carcinogenicity of DEHP to humans is uncertain. Assuming that the positive findings indeed provide a basis for extrapolation to humans, the estimation of equivalent human doses involves considerable uncertainty. Because of an inadequate understanding of the mechanisms of carcinogenesis, a scientific basis has not been developed for selecting among several alternate dose-response models, which yield widely differing results. Apart from the risk via ingestion, risks may result from either dermal absorption or inhalation of DEHP. However, toxicological data corresponding to these routes are not available for extrapolation purposes. For the general population, exposure to phthalates, as indicated by exposure to DEHP, results primarily from food ingestion. By comparison, water ingestion and inhalation of ambient air account for much less exposure. The combined exposure level for an average individual (average in that the person has a normal diet and average water drinking habits) would be about 0.27 mg/day DEHP. The maximum exposure could be as much as 10 mg/day. Certain subpopulations might have significantly greater exposure to phthalates. Persons who work in plastics manufacture or in formulation, calendering, or other processes in which phthalate esters are used, might have exposures as high as 6.3 mg/kg/8-hour exposure. Note that this is a worst</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>case exposure value reported in the literature and may not represent current manufacturing processes. hospital patients who receive large quantities of blood, or who are dialyzed regularly, could also receive fairly large exposure to DEHP or other phthalates. These populations are probably small. Another worst case consists of a small population who eat primarily a high fat content diet of prepacked foods. In the example presented here, the person's diet was assumed to be equivalent to 2 kg/day and containing 10% fat. This represents an upper level exposure for this subpopulation (11 mg/day). The consideration of fate mechanisms indicates that export of DEHP is the primary fate mechanism in water. The U.S. EPA model (EXAMS) predicts that neither chemical (oxidation, hydrolysis, and photolysis) nor biological processes will determine the fate of DEHP. It has also been demonstrated that volatilization is unimportant. Laboratory studies suggest that biodegradation by fish and microorganisms may be more important than the model predicted. Phthalate esters are concentrated in lower aquatic organisms. However, fish appear to be able to metabolize these chemicals. Adsorption is not an important loss mechanism in a steady-state system, although DEHP is concentrated in sediment. The results presented above also suggest that DEHP will be more persistent than the other phthalates, especially DMP. The primary fate mechanism for DMP in rivers is export. In all other aquatic ecosystems, however, biodegradation dominates. The fate of phthalate esters in air is expected to be controlled by hydroxyl radical attack. Adsorption onto particulates and rainout is not expected to be important. Although large amounts of phthalate esters are disposed of in landfills, the original products retain the greater part. Available phthalates would be subject to biodegradation and leaching. Evidently little coupling occurs between the air and water compartment because, in the case of DEHP at least, very little volatilizes from the water and very little rains out of the air. The water fraction is largely exported to the ocean, and the air fraction is degraded relatively quickly by reactions with the hydroxyl radical. In summary, phthalate esters have extremely low concentrations in water and air. Esters other than DEHP are biodegraded and hydrolyzed more rapidly in both the water and fish compartment. Rapid degradation in air holds the concentration levels in the atmospheric compartments to relatively low values. Soil and sediments are areas requiring further experimental and field investigations. Because of their relatively high partition coefficients, the larger phthalate ester molecules may tend to accumulate in these media. Phthalates esters are not commonly found in natural waters at concentrations that affect most aquatic organisms. However, data on aquatic effects are limited, and water quality criteria have not been set for phthalate esters. The U.S. EPA has stated that acute and chronic toxicity to freshwater aquatic life occurs at concentrations as low as 940 ug/l and 3 ug, respectively, and may occur at lower levels for more sensitive species. Based on a review of the data available, concentrations of the phthalates affecting aquatic organisms were usually greater than 1000 ug/l, ranging from 1900 ug/l to over 100,000 ug/l. The lowest concentration of DEHP found to affect aquatic organisms, 3 ug/l, inhibited reproduction in Daphnia by 60%. The lowest effective concentration of DBP was 100 ug/l, which limited growth of dinoflagellates, marine organisms. Many locations appear to have water concentrations of DEHP that could affect Daphnia populations. The effects concentrations of 3 ug/l are very close to the detection limit for DEHP. Therefore, wherever the chemical was measured and detected, it could potentially have an effect on these organisms. However, the reported effects at 3 ug/l should be confirmed, since this level is relatively low compared with other observed effects. The lowest effect concentration reported for DBP of 100 ug/l is not commonly reached in ambient concentrations; however, two river basins reported a significant number of observations at this concentration or higher. For the most part, however, concentrations affecting fish were normally not found in ambient waters. Also, concentrations having acute effects on aquatic invertebrates are not commonly detected in the environment. It is difficult to determine what impact reproductive impairment in Daphnia would have on the higher organisms feeding on them. Thus, the indirect risk of "important" aquatic species through the decline of, or contact with, contaminated daphnid population cannot be assessed in this work. Insufficient monitoring and effects data are available on the remaining phthalates, DNOP, DEP, and DMP. Reported environmental concentrations tend to be few, and these concentrations are low. Assessment of the risk of these phthalates to aquatic organisms is not possible because of the insufficient data, although it appears from the data available that present levels of DEHP in the environment may pose a risk to some invertebrates. DEHP appears to be the most persistent of the phthalates and the most ubiquitous in the environment. The effects data for DEHP do not deviate greatly from those for other phthalates. Therefore, the other phthalates (DNOP is not included because of the lack of effects data) probably pose less of a risk to aquatic organisms than DEHP. The salmonid fish species, which are usually more sensitive to pollutants than other fish</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>species, have not been studied extensively for their susceptibility to phthalate esters. The limited information available does not indicate that they are more sensitive to any of the phthalates than warm water fish. DEHP has very low solubility; it is probably that in cold water it is even less soluble than under laboratory conditions, which are normally conducted at 25°C. Any effects of DEHP in a cold water system, therefore, may be mitigated by the low temperature. Monitoring data of phthalates concentrations in cold water systems are not extensive enough to support speculates on risk to salmonids. The only information available on toxicity to aquatic organisms through ingestion of phthalates measured subacute effects of DEHP on zebra fish and guppies. Concentrations in the food of 50 ug/kg and 100 ug/kg slightly reduced reproduction in zebra fish and guppies, respectively. Guppies feed primarily on aquatic invertebrates. Apparently, many species easily accumulate much higher concentrations than those reported above. The concentrations reported in those species representing food sources may affect fish reproduction. Unfortunately, no information was available on acute effects through ingestion. Section 6.1 suggest, however, that phthalates are rapidly metabolized and clearly by fish when ingested. High concentrations in food sources, therefore, may have little effect on aquatic organisms that eat them. Only speculations can be made at this point until further investigation is conducted in this area. Phthalates, at least DBP and DNOP, do not appear to pose an acute risk to birds through ingestion of contaminated food because of the high concentrations required to produce acute effects. No effect information was available for other phthalates. The highest concentration of any phthalate reported in water or biota (and assuming it to be a potential food source) was 7.2 mg/kg. It is unlikely that concentrations of these two phthalates are high enough in the environment to cause acute effects. Because DEHP is abundant in the environment and appears to be most slowly metabolized of the phthalates, an assessment of its risk requires data on the effects on avian species. Also, phthalates may have subacute effects on birds at lower concentrations that could conceivably be attained through bioconcentration. Further investigations on the acute effects of other phthalates and subacute effects are required to determine realistically the risk phthalates pose to birds.</p> <p>gee mike.....it don't really sound like a desert topping.....does it? i deeply regret your acc point of veiw.....</p>
F-GC-76	<p>The American Chemistry Council is a top trade association representing North American chemical manufacturers. ACC represents represents nearly 150 companies and has a \$100 million budget. The group spent more than \$2 million on lobbying in 2003.</p> <p>History ACC merged with the American Plastics Council in 2002. Formerly know as the Manufacturing Chemists' Association, then later renamed as the Chemical Manufacturers Association, ACC adopted its current name at its June 2000 membership meeting.</p> <p>Battling Precautionary Principle In November 2003, the Environmental Working Group released a leaked memo drafted by Tim Shestek, a lobbyist with the ACC. The memo outlined the key features of a campaign proposal from Nichols-Dezenhall to counter growing support for the precautionary principle in California, which it argued could create a national trend.</p> <p>Fighting Over Gas According to a June 1, 2004 article in The Hill, the organization has been facing an internal struggle between the interests of its members, particularly over the increased price of natural gas. ACC member companies that primarily manufacture plastics or chemicals use natural gas for heating and electricy and were upset with ACC weak lobbying position on natural gas prices. But ACC also has integrated oil and gas companies as members who benefit from high natural gas prices.</p> <p>Kids on Pesticides In October 2004, ACC gave the Environmental Protection Agency \$2 million to help fund a study exploring the impact of pesticides and household</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>chemicals on young children. Messaging and PR Greg Lebedev left his position as president and CEO of ACC on June 1, 2004. The Hill reports, "[L]obbyists who spoke on condition of anonymity said the group's governing board effectively pushed Lebedev out, in part because members thought he had not moved swiftly enough to cut costs or develop a coherent association message." In 2003, Lebedev had proposed a PR campaign for ACC to boost the industry's image. Initially pushing for a \$60 million campaign, the effort is reported to have been scaled back to \$20 million after complaints about the project's value. In the fall of 2005, the ACC launched "an integrated public education campaign to raise the chemical industry's image and reputation," called "essential2." ACC hired Ogilvy Public Relations Worldwide, APCO Worldwide and Ogilvy & Mather for the campaign, which is expected to cost \$35 million over two years. Part of the "essential2" campaign is a new website, americanchemistry.com. In a press release, Ogilvy & Mather's David Fowler said essential2 would be a "360(degree) communication effort," including "press, television, public relations, online and employee communications." [2] In the same release, ACC President and CEO Jack N. Gerard was quoted as saying, "essential2' makes a powerful statement about how connected we all are and how central chemistry is to the health and growth of our nation. For example, the chemistry industry is America's leading exporter, accounting for 10 percent of all U.S. exports, and we generate more than half a trillion dollars for the U.S. economy each year." [3] While promoting the chemical industry as vital to the economic health of the nation the ACC simultaneously lobbied against the Toxics Release Inventory (TRI), a public right-to-know program. Under TRI, the U.S. Environmental Protection Agency annually reports on what industries release into the air, water and land. The ACC "has urged less frequent reporting since 1999." ACC's Michael Walls said, "Just because we're used to doing something doesn't mean we should accept the inherent high costs or burden of doing it." The Bush administration supports changing the TRI so that fewer releases are reported, less frequently. EPA officials say they will "likely spend another year weighing the pros and cons" of the proposed changes, after the public comment period ends on December 5. According to federal records, the EPA "previously solicited comments from industry groups." ACC Programs Responsible Care ACC Affiliates American Solvents Council Chlorine Chemistry Council CIIT Centers for Health Research European Chemical Industry Council or CEFIC Hydrogen Fluoride Panel International Council of Chemical Associations Phosphate Forum of the Americas Phthalates.org Synthetic Organic Chemical Manufacturers Association hmmm....something stinks.....do you smell that?</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-77	<p>Some ideas for what California can do to start advancing chemicals policy</p> <p>Here are some ideas for what California can do to start to advance chemicals policy and promote green chemistry. They are derived from ideas I have presented at several GCI forums, but I wanted to add them into the mix being collected via the Conversation.</p> <p>What can California do?</p> <ul style="list-style-type: none"> • Ensure access to information gathered by others <ul style="list-style-type: none"> – Negotiate for access to confidential business information (CBI) submitted under the European Union’s REACH Regulation and under the Canadian Environmental Protection Act (CEPA) – Require companies making/importing chemicals in California that are subject to REACH or CEPA to submit the same information to California officials – Enhance existing IT infrastructure to receive and share the large volumes of REACH data • Set clear criteria to identify chemicals of concern <ul style="list-style-type: none"> – Can be hazard-based (e.g., PBTs) and exposure-based (e.g., chemicals detected through biomonitoring) – Use these criteria to drive further assessment and control of chemicals meeting the criteria – Require adherence to clear timelines for conducting assessments and making control decisions • Map the flow of chemicals in California by developing and sharing production/use info <ul style="list-style-type: none"> – Require California producers/importers and users to submit and update information on production and processing (amounts, facility locations), uses (including in products), and post-use management – Require updating of MSDSs to reflect all available data (US HPV Challenge, REACH, Canada) – Require disclosure of chemicals in consumer products • Could focus initially on priority chemicals (Canada priority list, REACH Substances of Very High Concern (SVHC) list) • Advance the science <ul style="list-style-type: none"> – HPV, REACH data sets use 20+ yrs. old tests (“old toxicology”) – Fail to account for: <ul style="list-style-type: none"> > Emerging issues, e.g., endocrine disruption, development neurotoxicity > Emerging science, e.g., low-dose effects, timing of exposure during development > Emerging methods, e.g., toxicogenomics, high-throughput screening and mechanistic assays > Perpetual concerns: e.g., cumulative, aggregate exposures, susceptible subpopulations – California is well-positioned to help move toxicology into the 21st century – Can help to develop, road-test and share new methods, testing strategies – Utilize biomonitoring data and methods to advance dose and exposure measurement – Press industry, federal government to move forward – Collaborate with universities <p>Why do this?</p> <ul style="list-style-type: none"> • Casts a broad net – to identify not only “bad actors” but also chemicals of low concern • Influences and informs chemical and product design decisions • Identifies and fills gaps – information (data and safety) and technology gaps • Empowers a range of actors – government, industry, academics, public – to advance knowledge and make better decisions about chemicals

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-78	<p>Limitations to Risk-Driven Approaches to Chemical Prioritization [NOTE: This post is based on a paper I published in the OECD Series On Testing And Assessment, No. 51, Approaches to Exposure Assessment in OECD Member Countries: Report from the Policy Dialogue on Exposure Assessment in June 2005, Chemicals Committee, Organization for Economic Cooperation and Development, p. 109, available at http://appli1.oecd.org/olis/2006doc.nsf/linkto/ENV-JM-MONO(2006)5. It is provided in part to respond to the American Chemistry Council's comments arguing for sole reliance on risk-based evaluation for chemicals.]</p> <p>While both hazard and exposure are clearly relevant in determining chemical risks, there are critical differences between our ability to assess hazard and exposure that have implications for the development and application of risk and exposure assessment policies. And real-world experience in chemical assessment programs that have attempted to rely on exposure information to prioritize chemicals also offers lessons for exposure assessment. In this paper I first address these issues, and then discuss their implications for risk and exposure assessment policies.</p> <p>Critical differences between assessing hazard and exposure</p> <p>Approaches to integrating exposure assessment into regulatory decision-making need to acknowledge and account for a number of critical differences between the nature of hazard and exposure information and their relative extent of availability. While both hazard and exposure are clearly relevant in determining risk, certain characteristics of exposure information pose serious challenges to sound decision-making:</p> <ol style="list-style-type: none"> 1. Hazard is largely inherent to a chemical, and doesn't fundamentally change over space or time, whereas any exposure information necessarily represents only a "snapshot" in both space and time. <p>A chemical's hazard is relatively intrinsic, largely or entirely independent of how the chemical is used, where or how it enters the environment, or other factors that vary with time and place. Hazard data are therefore relevant (i.e., necessary though not sufficient) in characterizing risk whatever the use of a chemical, and hence are useful in understanding any and all potential uses of or exposures to a chemical -- and what kind of exposure-reducing efforts may need to be taken.</p> <p>Just the opposite is true for exposure, the potential for which changes depending on how a chemical is produced, used, transported and discarded. Conditions that determine exposure can and often do differ enormously for every setting and point in time that a chemical is present. And even if a "snapshot" of current exposure were able to be assembled, the next new use or activity leading to a release would alter the exposure picture.</p> <p>The variable nature of exposure poses a major challenge to exposure (and risk) assessment: It means that exposure assessment must be an ongoing activity, with the scope and frequency of its measurement sufficient to characterize the variation in as well as magnitude of exposure.</p> <ol style="list-style-type: none"> 2. Voluntary and regulatory mechanisms for generating and collecting exposure information are undeveloped relative to those for hazard information. <p>Extensive international consensus exists as to how to test a chemical for most hazardous properties. Detailed government-sanctioned procedures, guidelines, criteria and standards are already in place for conducting hazard tests, for assuring the quality and reliability of the results, and for determining whether the results constitute evidence of a particular hazard. Moreover, these measures allow that results are reproducible and can be independently verified.</p> <p>In contrast, virtually none of these mechanisms are in place to assure that exposure information is complete and accurate. Debates over what constitutes adequate exposure assessment and how to address the "moving target" nature of such information are far from resolved. Government-sanctioned procedures for generating, evaluating the adequacy of and interpreting exposure data have yet to be developed or validated, including testing and measurement standards, guidance, methods and tools.</p> <p>Even use and exposure information reported in sufficiently qualitative terms or sufficiently aggregated form so as to eliminate any confidential business information (CBI, see next bullet) concern is rarely systematically collected and made public. For the first time, beginning in 2006, USEPA has begun to require the reporting of basic information relevant to understanding uses of and exposure to chemicals, although it will be limited to several thousand</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>chemicals, and will be collected only once every five years – despite enormous documented variability in these chemicals’ production volumes that presumably reflects changes in their underlying use patterns.</p> <p>3. Differential access to both exposure data and the means to generate them severely limit the “reproducibility” of such data. In addition to the variability and absence of agreed-upon procedures noted above, other factors limit “reproducibility,” that is, the ability to readily and independently measure or verify exposure data. Most exposure data and the means to generate them reside virtually exclusively with industry. It must be acknowledged that industry has a strong interest in maintaining that exposure to its products is low, so the ability to independently measure and verify exposure data is critical. Yet physical access to many exposure “settings” (e.g., workplaces) is very limited and infrequent at best, even for government officials.</p> <p>Broader access to exposure-relevant information is even more restricted: Wide latitude is typically provided to claim chemical use and exposure information as CBI, preventing even its review outside government; this situation is often in contrast to that applying to hazard data, which is more likely to be deemed ineligible from designation as CBI.</p> <p>Finally, even chemical manufacturers have incomplete access to and information on their customers and how their chemicals are used. Intermediaries (vendors, brokers, distributors) are a formidable information flow bottleneck, as is the often-proprietary nature of information concerning downstream use and competition among suppliers. These factors serve to impede information-sharing even within supply chains, which in turn affects the extent and accuracy of exposure-relevant information that any one entity in a supply chain can provide if asked or required to do so.</p> <p>For all of these reasons, we believe that risk and exposure assessment at this time are simply too uncertain and unreliable to serve as a basis for deciding for which chemicals hazard data should be developed. While ultimate decisions concerning risk identification and management need to account for exposure as well as hazard, in all but the most exceptional cases, chemical prioritization approaches should be hazard-, not risk-driven.</p> <p>Difficulty of using exposure information in chemical priority-setting: OECD experience as a real-world example</p> <p>The ongoing work of the OECD Existing Chemicals Program vividly illustrates the limitations to available exposure information – and to efforts to prioritize chemicals based on such information. In that program, chemical-by-chemical assessments of high-production volume (HPV) chemicals are conducted. Typically, industry collects existing information and conducts any testing needed to fill gaps in the required set of hazard information. Industry then prepares draft assessment documents, which are reviewed by health and environmental agency officials in member countries. While the primary emphasis is on hazard assessment, program procedures currently allow for exposure information to be included to “place the hazard information into context.” As we have documented in detail elsewhere, in practice this exposure information is routinely being used to decide that chemicals that have been identified as possessing clearly hazardous properties are nevertheless low priorities for further work based on “anticipated low exposure.” Unfortunately, the exposure information typically being relied upon has truly massive deficiencies with respect to scope, quality and completeness. Such information typically is:</p> <ul style="list-style-type: none"> • very limited in scope, and hence incomplete or even haphazard in its coverage of potential exposures, because it: <ul style="list-style-type: none"> - covers only a portion of known production and use; - covers only a subset of relevant activities, e.g., production, transport, storage, processing, use by customers, use in consumer products, product disposal, waste management; - covers only a subset of exposed entities, e.g., workers, consumers, the general population, sensitive populations, and wildlife; - addresses only a subset of relevant routes of exposure, e.g., by inhalation, ingestion or dermal contact; through food, water, air; - rarely is based on ongoing or sufficiently frequent measurement to address variation or changing conditions; • unverified, unpublished, rarely peer-reviewed and of uncertain or undetermined quality;

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>• frequently based on judgment or speculation, rather than on actual measurements, monitoring or validated methods of exposure modeling. Some of these deficiencies are related to the limited requirements under the program governing what exposure information is to be provided. However, others reflect the fundamental characteristics of exposure information described in the first section of this paper, as well as limitations on the extent and quality of information actually available and the capacity for effective review, and the lack of agreed-upon measures of scope, quality and completeness. The OECD ing Chemicals Program has wrestled repeatedly with this problem over its history. Indeed, because of what many saw as an over-reliance on exposure-related considerations in the absence of an agreed-upon approach, the program went through a major refocusing to return to a primary focus on hazard characteristics as the primary driver for the program. However, despite the refocusing effort, inconsistent and insufficient exposure-related information – more than any other factor – drives the recommendation process for chemicals being assessed through the program.</p> <p>Implications for risk and exposure assessment policy</p> <p>All of the factors discussed above mean that assembling a complete and reliable exposure picture even for a single point in time faces obstacles and has proven exceedingly difficult in practice. So how should risk and exposure assessment policies – and practices – address these current realities?</p> <p>Guidelines development: We continue to strongly support the development of comprehensive guidelines for collection, analysis, validation and presentation of exposure information, as the much-needed foundation of any exposure assessment policy and practice. In our view, the OECD program needs to invest at least the same effort in developing a process for exposure assessment as was invested in developing the hazard screening program. There remain a number of substantial obstacles that must be solved in order to ensure that adequately robust data on exposure can be gathered. Resolving these challenges will not be easy. These obstacles include:</p> <ul style="list-style-type: none"> • lack of agreement as to what exposure information is relevant and needed; • lack of consensus as to the framework and methodologies needed to conduct an exposure assessment; • limited availability of and access to internationally accepted, comprehensive measured exposure information or models for predicting exposure; and • limited information available on all uses and other exposure pathways of chemicals. <p>Guidelines need to ensure that the measured and modeled or estimated data address and are representative of the full range of actual and potential exposures that can or do occur. Procedures are needed to govern, for example, the minimum number of samples, the frequency of sampling, and other parameters so as to ensure that the results of any exposure measurements are both statistically meaningful and representative of the spatial and temporal variations present in the sampled environment. Quality assurance/quality control procedures to ensure data quality are needed. Where data are available for only a subset of production sites/release points/exposure sources, procedures are needed to determine whether and if so how extrapolations from available data can be used to characterize exposures arising from the missing sources.</p> <p>Adequate expert review: Policies need to provide for thorough review of exposure information. This starts with ensuring exposure-related expertise among reviewers is sufficiently diverse to address each of the various relevant exposure settings (workplace, consumer, environmental), and data generated through direct measurement as well as modeling. The review process should yield an explicit assessment of the scope, completeness and quality of the exposure information, in which any conclusions are qualified to accurately reflect the actual extent and nature of exposure information provided and hence the degree of associated uncertainty. Specific factors to be assessed should include:</p> <ul style="list-style-type: none"> • Scope and Completeness: geographic, temporal extent of applicability and associated limitations; to what fraction of total production and use, to what uses, and to which specific facilities, processes, activities and products the provided information applies; which activities associated with the chemical's full lifecycle (production, processing, storage, transport, use and disposal) are covered; whether information on releases and exposures relate to workers, consumers, public or the environment; whether information is based on measurements, modeling, judgment, extrapolation. • Quality: extent of documentation provided/cited; reference to/description of procedures used; representativeness of sampling underlying any measured data; validation of any model used; peer review and extent of access to underlying data; assignment of measures of reliability; reproducibility.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>Accounting for the variable nature of exposure: Policies need to acknowledge and account for the inherent variability in exposure over time as well as space. For example:</p> <ul style="list-style-type: none"> • For new chemicals, the nature or extent of production, use and exposure needs to be tracked and revisited/reassessed over time, not only as a chemical enters commerce but as its production level and range of uses change. During the initial review/approval process, conditions should be included that require reporting of any changes in the nature and extent of production and use and other exposure-relevant factors, and such reports should trigger a reassessment of exposure potential. • For existing chemicals, policies should also be responsive to changes in the production level or use profile of a chemical. One recent illustration of this need in the U.S. is the change that has accompanied the phase-out of pentabromodiphenyl ether and its replacement with a different chemical, the production and use of which has increased dramatically as a result. <p>Data verification and model validation: To the extent data from industry are relied on, policies need to incorporate mechanisms to ensure and demonstrate that such data are accurate and representative, and wherever possible, to be able to independently verify such data.</p> <p>To the extent that modeled as opposed to measured data are relied on to provide exposure estimates, policies need to outline procedures to be employed to validate the models, provide public access to the models and their underlying data sets. Just as for measured data, policies also need to ensure that models effectively account for variation in exposure over time.</p> <p>Differential access: The differential access to exposure-related information (as discussed above) is a serious barrier to public confidence in both industry- and government-derived exposure assessment. In addition to adopting and abiding by comprehensive guidelines covering all aspects of exposure assessment, government needs to develop and implement mechanisms to demonstrate that it can independently verify the reliability of industry-generated exposure information; and industry needs to be encouraged or required to implement its own measures to increase confidence in the information it provides, including routine third-party review and a commitment to make information public whether exculpatory or not.</p> <p>In addition, policies need to consider means to break through the supply-chain bottlenecks that effectively prevent development of a full understanding of chemical processing and use. In our view, one of the key innovations offered by the European Union's REACH regulation is its intent to compel information-sharing up and down the chemical supply chain.</p> <p>Finally, in our view, serious reconsideration of the currently overbroad broad allowances for CBI claims related to exposure-relevant information is warranted.</p> <p>Transparency: Policies should ensure that any descriptions of exposure information are clear and transparent in describing the scope and nature of the information and its limitations, including by addressing all of the elements specified above under Scope and Completeness and Quality.</p> <p>Policies should require that conclusions or recommendations be carefully written and explicitly qualified so as to limit their perceived and actual applicability to those settings for which information has been provided and deemed sufficient to warrant the conclusion or recommendation. Furthermore, the degree of uncertainty associated with a conclusion or recommendation should be stated and should reflect the extent of exposure information available. Lastly, policies should ensure that in the absence of good exposure information, exposure should be assumed possible or likely.</p> <p>Additional challenges</p> <p>Cumulative and aggregate exposures: A common limitation of exposure assessments in practice is to examine exposures only to single chemicals at single points in time, or from single sources or products, as if they occur in isolation from other exposures that are in fact relevant to understanding the true nature and magnitude of exposure. While understandable given the complexity involved in going further, this frequent failure to consider or even acknowledge the need to ultimately examine cumulative and aggregate exposures undermines the credibility of an exposure assessment. Policies, therefore, need to ensure that an accurate context is provided within which to judge a particular exposure assessment, one that accounts for factors such as:</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<ul style="list-style-type: none"> • production, processing and use of the same chemical by multiple entities; • multiple uses of the chemical leading to actual or potential exposures; • multiple routes of exposure (direct, indirect) to a chemical; • continuous or periodic release of or exposure to a chemical; and • exposure to multiple chemicals producing the same/similar effects and/or acting by the same/similar mechanism(s) <p>Biomonitoring/environmental monitoring/health tracking: The ultimate arbiter of the value of exposure assessment is the extent to which its findings comport with reality. It is relatively rare for extensive data from actual environmental and biomonitoring to be available, and rarer still for health tracking statistics to be available that can be linked to particular exposures. Nonetheless, exposure assessment policies should ensure that such data are examined and incorporated where available, and should encourage the development of and public access to such data.</p> <p>Susceptible subpopulations: In addition to variation over time and space, exposure to a chemical or the effects arising from such exposure may differ among particular subsets of human or ecological populations. This variation may be due any number of factors, such as inherent differences in the subpopulations themselves (e.g., children's respiratory rates are higher than those of adults), differences with respect to proximity to, or reliance on activities associated with, particular sources of exposure (e.g., occupational exposure, dependence on a diet high in fish or groundwater as a drinking water source), or differences in sensitivity to a substance (e.g., sensitization, genetic susceptibilities). (Less understood at present are the analogous differences in ecological subpopulations.) Policies need to account for such variations and ensure protection of the most susceptible and sensitive sectors of potential exposed populations.</p>
F-GC-79	<p>I do not understand the message of this post. It seems to be saying that it is often hard to estimate exposure potential for a particular chemical. This is undoubtedly true. However, hazard information is meaningless without exposure/dosage information. Most things are hazardous at some dose.</p>
F-GC-80	<p>Director, Environmental Sustainability Programs</p> <p>Ecolab Inc. supports science and risk-based chemical management policies that balance the 'triple bottom line' of sustainability: protection of the environment, assurance of product safety and promotion of innovation in the marketplace.</p> <p>Ecolab encourages the members of the California 'green' committees in the following specifics:</p> <ul style="list-style-type: none"> • Understand both the burdens and benefits of new regulatory proposals. • Find a way to successfully manage both toxicity and exposure (i.e., risk) while providing the solutions California needs. • Utilize risk assessment methods that integrate knowledge regarding potential hazards of chemicals with an understanding of their uses and exposures. • Look for product stewardship and risk management programs that establish mechanisms to assure exposures remain in the safe region for typical uses and foreseeable misuses; and • Enact laws and regulations that: <ul style="list-style-type: none"> • are science-based, • balance potential risks with benefits, • factor in existing scientific knowledge as well as reasonable uncertainties, and • consider the degree of risk to people and the environment." <p>We encourage California to study the availability of data now, particularly the availability of both hazard and exposure data, so that risk determinations can drive decision making. Please coordinate information needs with other governments and other sources of information. Do not reinvent the wheel.</p> <p>Ecolab is in the process of evaluating products/services to evaluate the 'greenness' and 'sustainability' of our products. One of the companies we have</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>evaluated is Chemical Compliance Systems, Inc. (CCS) which specializes in ecological, health and safety compliance, chemical security, and hazardous material management services. CCS has a database containing 220,000 chemicals and more than 75,000,000 data elements comprising 43 key environmental metrics. I first became aware of CCS on June 28, 2007 when I heard Dr. George R. Thompson, President & CEO, giving a presentation called "Web-based Databases That Facilitate Chemical, Product and Process "Green" Assessments and Automated "Green" Cleaning Product Development or Acquisition Assessments" at the 2007 Green Chemistry & Engineering Conference, Washington DC (www.GCandE.org)</p> <p>For products we submitted to them, they organized the results in three categories Ecology, Human Health and Safety in their default product 'report card' which weighs constituent chemicals and their percentages in the formulation. They evaluated and produced 'report cards' on both concentrates and ready-to-use solutions on a number of our products, showing the sensitivity of their approach.</p> <p>The following procedure was used to produce each report card. For each metric, the chemical that is least sustainable/green is given a score zero and the most sustainable/green is assigned 100. The scores in between are normalized so that each chemical (all 220,000) has a quantitative normalized score. They also have a Cross-Reference Dictionary & Regulatory Lists. The Chemical Cross Reference Dictionary contains 550,000 records of purified CAS numbers and their associated synonyms. This file facilitates accurate and complete materials management data searches and product substitution research. The Regulatory List of Lists file is comprised of over 650 international, federal, state and local regulated chemical lists and their associated data, as well as numerous CCS compiled lists (e.g., incompatible chemicals, hazard classes, etc.). CCS' modules compare a single chemical inventory file against these lists and generate a multitude of regulatory reports utilized by logistics, environmental/safety/ health, and chemical security professionals, as well as first responders.</p> <p>I strongly recommend California evaluate CCS's capabilities for application as part of California's Green Chemistry Initiative. I believe California's efforts will benefit from use of CCS's capabilities.</p>
F-GC-81	<p>lots of post's NO DIALOUGE i see many post's but no interaction between the poster's... could we perhaps have some interaction so as to stimulate ideas...? or is this site a reflection of the lack of cohesive cooperation needed to solve the problem</p>
F-GC-82	<p>The Chemicals Market Cannot Generate Green Chemicals Unless the Data Gap is Closed The Chemicals Market Cannot Generate Green Chemicals Unless the Data Gap is Closed Abstract The chemicals market is not a properly operating free market. Lack of publicly available information about the health and safety attributes of chemicals on the market – the Data Gap -- is making it impossible for those who buy chemicals to identify safer alternatives. When those who prefer green chemicals cannot identify and then purchase them, their demand cannot drive the market to supply green chemicals in favor of older, more hazardous chemicals. California has the capacity to take targeted steps to close the Data Gap, steps the state should take to foster a chemicals market that is capable of steadily innovating incrementally safer chemicals in response to market demand. Comments I am the Legal Director of the Science & Environmental Health Network (SEHN), a member of the coalition of NGO's called Californians for a Healthy And Green Economy (CHANGE). The prospect of comprehensive chemicals policy reform by California raises many issues. I wish to call more attention to one particular issue that is not commonly explored in debates over the regulation of chemicals, although it is raised by Wilson, M. P., et al. "Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation," California Policy Research Center (2006) (http://coeh.berkeley.edu/news/06_wilson_policy.htm) ("the</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>UC Report”). These comments are informed by my personal experience for over 15 years as an intellectual property attorney in the biotechnology industry and by my professional interest in the role of government in stimulating industrial innovation.</p> <p>One of the many lenses through which the UC Report views chemicals policy is the lens of the chemicals market. The UC Report clearly raises the following question: "Does the chemicals market, including the incentives provided by the legal and regulatory systems, adequately motivate industrial investment in green chemistry?"</p> <p>The answer to this question, which the Green Chemistry Initiative must squarely face, has to be “no.” To reach this conclusion, one need do little more than consider the following two facts brought forth in the UC Report:</p> <ul style="list-style-type: none"> • The 3,000 or so High Production Volume (“HPV”) chemicals (those made or imported at over one million pounds per year) constitute more than 99% (by weight) of the chemicals in commerce in the U.S. • Of today’s HPV chemicals, only 248 (about 8%) were introduced after 1979 (when the original TSCA Inventory of chemicals then in commerce was created). See UC Report, at p. 43; National Pollution Prevention and Toxics Advisory Committee, “Broader Issues Workgroup Thought Starter,” at p. 4 (October 6, 2005) (see http://www.epa.gov/oppt/npptac/pubs/documents.htm). <p>In other words, of the individual chemicals that together constitute over 99% by weight of the chemicals market, 92% were in the market 30 years ago. Of how many industries can it be said that its product line has changed so little in 30 years? The chemicals industry claims to be an innovative industry. If it is, it would seem that the industry is innovative not at developing new and safer chemicals, but mostly at finding new ways to use and formulate existing chemicals.</p> <p>This low rate of replacement of existing commercial chemicals is remarkable in view of the prevailing recognition that many of these chemicals, and not just a few, are likely to constitute some type of hazard. Basic research over recent decades has shown that many chemicals have a wide variety of adverse effects that often emerge many years after very low levels of exposure (including carcinogens, mutagens, reproductive toxins, neurotoxins, immunotoxins and others). The Canadian government has recently completed a review of the 23,000 chemicals registered for commerce in Canada and, despite data gaps, was able to identify over 4,000 chemicals as of sufficient concern to warrant further study (see http://www.ec.gc.ca/substances/ese/eng/dsl/cat_index.cfm). The European Commission, in developing REACH, concluded that 70% of the chemicals evaluated under its new chemicals program between 1981 and 2003 were shown to have one or more dangerous properties. European Commission, Extended Impact Assessment, COM(2003)644 final, SEC (2003) 1171/3 (October 29, 2003) (“EC Extended Impact Assessment”), at page 27 (http://ec.europa.eu/enterprise/reach/docs/reach/eia-sec-2003_1171.pdf). While the data gaps make it difficult to estimate precisely what proportion of chemicals on the market are likely to present a threat to human health and the environment, it is also difficult to dispute the European Commission’s conclusion that under the EU’s regulatory system that preceded REACH (and closely resembled the U.S. TSCA), a “significant proportion of all chemicals will enter the environment and reach sufficiently high concentrations to induce adverse effects.” Id. In the United States and in California, we face this very same issue.</p> <p>What can account for such slow innovation of safer alternatives despite the technological promise of green chemistry? One reason is that our regulatory system is ineffective at removing hazardous chemicals from the market or restricting their use. As the UC Report describes in detail, the Data, Safety and Technology Gaps undermine the effectiveness of both federal and California environmental statutes. The weakness of the regulatory system permits chemicals manufacturers and industrial users of chemicals to externalize the damage associated with their products, rather than incorporate the cost of that damage into the price of their products. Because society therefore bears these externalized costs, manufacturers have little incentive to develop safer alternatives.</p> <p>Although not directly addressed by the UC Report, the Data Gap also compromises the efficacy of the tort liability system. Plaintiffs injured by toxic</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>chemicals must prove that they were exposed to particular chemicals and that those exposures caused their injuries. This burden is impossible to carry when people are exposed to chemicals that no one knows are toxic. Even the product liability laws, purportedly grounded in strict liability, require proof that the product caused the damage, proof that cannot be provided when such information does not exist. Under both our tort and regulatory systems, then, damage simply lies where it falls when it is caused by hazards that are unrecognized because of the Data Gap.</p> <p>But there is another reason, and that is the major focus of these comments. The Data Gap directly undermines the operation of the chemicals market and prevents it from operating as a properly functioning free market ought to act. While this issue is discussed in the UC Report (see UC Report at pp. 23, 37-55), it is worthy of a somewhat more detailed explanation. The thrust of these comments is also described in Guth, J., Denison, R. and Sass, J., "Require Comprehensive Safety Data For All Chemicals," Background Paper for Reform No. 5 of the Louisville Charter for Safer Chemicals (2005) (www.louisvillecharter.org) (to be published in 2007 in <i>New Solutions Journal</i>).</p> <p>Over the last several decades, the field of information economics has demonstrated the crucial role of information in the proper operation of a market economy, and the serious economic consequences of "imperfect information" and "information asymmetries." For an overview of information economics, see Stiglitz, J. E., "Information and the Change in the Paradigm in Economics, Part 1," 47 <i>The American Economist</i> 6-26 (Fall 2003); Stiglitz, J. E., "Information and the Change in the Paradigm in Economics, Part 2," 48 <i>The American Economist</i> 17-49 (Spring 2004) (available at http://www2.gsb.columbia.edu/faculty/jstiglitz/papers.cfm). See also Stiglitz, J.E., <i>Globalization and Its Discontents</i>, pp. 73-74, 261n.2, W.W. Norton & Company, Inc. (2003).</p> <p>In the language of economists, an ideally functioning free market is one in which consumers are free to buy the goods and services they desire, which are then produced by the market according to the laws of supply and demand. But for demand to reflect what consumers truly value, consumers must have access to all information that would affect their choices. Without this information, the prices people pay for goods and services will not reflect their true preferences, and people will inadvertently buy goods and services they would not buy if they had more information. When this happens, the market is said to be "inefficient" because it is not producing goods and services according to the true desires of consumers. Lack of information causes a "market failure" by preventing the laws of supply and demand from driving the market to produce what people really want.</p> <p>Information economists have focused on the damaging economic effects of what they call "imperfect information," including both nonexistent information and information that is available to some, but not all market actors. They have shown that imperfect information and the resulting market failures and economic inefficiencies are pervasive in all economies, including the U.S. economy. They have shown that the market itself often does not provide incentives for creation and disclosure of information and, to the contrary, often provides incentives for market actors to conceal information in order to gain market power and entrench themselves in the market. They also have shown that the market often simply cannot correct these market failures.</p> <p>Government can take steps to correct this type of market failure in order to make the market more efficient, i.e., responsive to informed consumer demand. Government can require that the needed information be produced and made widely available to the market. Well-known examples of such government action include the securities laws (requiring accurate financial disclosures by public corporations) and the drug laws (requiring pre-market proof that drugs are safe and effective). These laws were adopted after serious threats to the proper operation of the financial and drug industries arose, threats that the market alone was unable to redress. Though these laws impose some burden on the affected industries and are by no means perfect, they have plainly strengthened those industries by making them more efficient in the economist's sense of being more responsive to the desires of investors and consumers, thus enabling the economy to produce financially stronger companies and better drugs.</p> <p>Turning to the chemicals market, many market actors are capable of using chemical safety information when they buy products, including information about the hazardous properties of chemicals as well as how they are used and disposed of. Industrial users of chemicals in particular are often technically sophisticated enough to choose the safest chemical that will suit their purposes, if they can get the information they need. Similarly situated are many other market actors, including:</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<ul style="list-style-type: none"> • public health professionals trying to evaluate and prioritize risks to the public; • purchasing organizations including those created by hospital groups; • state and local governments and others attempting to purchase safer products; • green building and other green standard setting bodies; • consumer organizations, and indeed many consumers, attempting to identify safer consumer products; • health-affected groups, citizens and community groups attempting to use information provided by the right-to-know laws to reduce pollution in their communities; • workers attempting to ensure safe workplaces; and • environmental and public health activists trying to motivate corporations to green their activities through market-based environmental and health protection campaigns. <p>However, the Data Gap -- the pervasive lack of safety information in a publicly-available, credible and reliable form for the majority of chemicals in commerce -- is impeding their efforts. While market actors can sometimes avoid products they know are hazardous, the data gaps render them unable to choose products that they know are safer. They are at constant risk of failing to choose what is in fact the safest alternative and of unwittingly choosing a product that turns out later to be equally or perhaps even more hazardous than the chemical they avoided. Because they cannot accurately select and buy safer alternatives, the demand by these market actors for safer products is not being adequately expressed or realized in the market.</p> <p>One often hears that some of these market actors, especially consumers, are incapable of understanding and actually using chemical safety data, so that making such data available to them would not drive the market toward safer chemicals. This argument ignores the fact that professional analysts often analyze complex information on behalf of market actors, who can then act on those analyses without necessarily understanding the information themselves. For example, most investors do not read the financial information made available to the market by individual companies – they rely on brokers, analysts and mutual fund managers to do so. In a similar recent example in the chemicals market, the Environmental Working Group has studied the ingredients of sunscreens and rated them for relative safety based on the information available about those ingredients (see http://www.ewg.org/node/21774). Clearly, readily available chemical hazard information would drive the large and growing demand for greener and safer products and would ensure that more chemical safety information would indeed be used by the market.</p> <p>The Data Gap also prevents chemical manufacturers from innovating and marketing safer chemicals even when they want to. Innovation cannot occur unless a firm has the willingness, opportunity and capacity to change its technology, and information about technological alternatives is fundamental to these preconditions for innovation. See Ashford, N.A, “An Innovation Based Strategy for a Sustainable Environment,” in Hemmelskamp et al. (eds.), <i>Innovation-oriented Environmental Regulation: Theoretical Approaches and Empirical Analysis</i>, pp. 67-107 (2000). Broad information about which chemicals are safe and which are toxic is the fundamental technological knowledge that would-be green chemists must have in order to design safer chemicals – without a full understanding of which chemicals are safe and why, green chemists cannot succeed. Moreover, when manufacturers are unable to fully understand and openly discuss the comparative safety of chemicals in the market, they cannot promote their own products as safer alternatives. Thus, even those who do sell safer chemicals cannot fully claim an advantage in the marketplace, and indeed may not even know they have such an advantage. By preventing manufacturers from gaining any reward in the marketplace for safer chemicals, the data gaps reduce the commercial incentive to develop safer products and reduce industry investment in green chemistry.</p> <p>There is also an asymmetry between pre-1979 and new chemicals (i.e., all chemicals introduced after 1979) that would seem to be causing even further distortion of the market. Though imperfect, TSCA does enable some opportunity for government scrutiny of newly introduced chemicals that does not apply to all older chemicals. This unequal playing field constitutes an additional regulatory preference for older chemicals. One of the explicit objectives of the EU’s new REACH chemicals regulation is to level the playing field for all chemicals and eliminate the preference for older chemicals.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>Some industry groups argue that the chemical industry possesses substantial chemical safety information that is not publicly available. But even if this is true, the mere existence of such information does the broader market no good. Information that is known by some market actors but not others is a type of imperfect information that causes market failures just as certainly as does nonexistent information. Information used by inside traders is an example. Industry groups also often argue that the HPV Challenge Program is filling the Data Gap. (For a recent critique of the completeness and quality of the data being produced by this voluntary program, see Denison, R. "High Hopes, Low Marks," Environmental Defense (2007) (http://www.edf.org/pressrelease.cfm?contentID=6658)). However, this program at best will provide the OECD SIDS (Screening Information Data Set) data. The SIDS dataset is a far smaller data set than REACH will require for high tonnage chemicals. It is only a set of screening level data that, while perhaps useful as a long-overdue starting point for evaluating these chemicals, is not likely to be sufficient to allow regulation under current law. Nor does this screening level data permit a reasonable evaluation of the safety of the HPV chemicals for human health and the environment, which is what the market needs in order for demand to drive innovation of safer chemicals. (For a comparison of the SIDS data set and the REACH high tonnage data set, see Appendix to Guth, J., Denison, R. and Sass, J., "Require Comprehensive Safety Data For All Chemicals," Background Paper for Reform No. 5 of the Louisville Charter for Safer Chemicals (2005) (www.louisvillecharter.org) (to be published in 2007 in New Solutions Journal)).</p> <p>In sum, the lack of credible and reliable publicly-available chemical safety information is dampening the influence on the market of the many social forces attempting to drive the innovation of the safer chemicals, and it is undermining the ability of industry itself to innovate those products.</p> <p>Why should the chemicals industry strive as it does to maintain such a flawed market? Unfortunately, it is an all too common story. The chemicals market is a classic example of a market dominated by mature firms that seek to block changes that would encourage innovation and entry into the market of new competitors that will gain market share. See Ashford (2000), cited above. Also, fear of liability and regulation that could result from proof their products are unsafe causes firms to perpetuate the information gaps and use them to protect their products and entrench themselves in the market. Thus, acting rationally in their self-interest, they resist actively studying the environmental health effects of their products, produce studies that all too often are designed to exonerate their products, resist independent study by others of their products and oppose measures that would encourage more information disclosure and foster innovation of safer substitutes by competitors. As a result, threats to human health and the environment can only be discovered too late, once chemicals become widespread throughout industry and the environment, and after the impacts have grown large, obvious, distinct and undeniable. If we seem condemned to struggle to protect the environment and human health by belatedly confronting substantial threats caused by entrenched and powerful industries, it is because our current chemicals market ensures that we are locked into this position.</p> <p>One advantage of a government strategy of remedying a market failure by closing data gaps is that its relative cost can be low. In the case of the chemicals market, the cost of closing the Data Gap would constitute a minimal percentage of product prices. After all, information about a particular chemical only has to be produced once. The great bulk of existing untested chemicals must be dealt with only one time; thereafter the information requirements for new chemicals on an ongoing basis would become a much-reduced and manageable task. One estimate of the direct and indirect costs of compliance with the EU's October 2003 REACH proposal (and not just the data requirements) was less than 10 billion euros over an 11 year period, less than 0.15% of the chemical industry's sales revenue over that period. Ackerman, F. and Massey, R., The True Costs of REACH, Global Development and Environment Institute, Tufts University (2004). The cost of REACH as actually passed is estimated by the EC to be much lower (see http://ec.europa.eu/enterprise/reach/faq_en.htm#cost). See also a 2004 overview of 36 studies on the expected impact of REACH on business and European society (http://www.eu2004-reach.nl/downloads/Comprehensive_Overview-v2.pdf). Moreover, each dangerous chemical that is replaced or prevented from ever reaching the market would not damage human health or the environment or need to be cleaned up. The European Commission determined that the costs of its chemical information and other requirements for 30,000 chemicals under the 2003 REACH proposal were far outweighed by the benefits expected from reducing human disease. European Commission, Extended Impact Assessment, COM(2003)644 final, SEC (2003) 1171/3 (October 29, 2003) ("EC Extended Impact Assessment"), pp. 24-29 (http://ec.europa.eu/enterprise/reach/docs/reach/eia-sec-2003_1171.pdf). Most</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>importantly, however, a chemical information requirement would underpin a marketplace that rewards innovation of safer chemicals and encourage creation of a sustainable, safer chemical industry. This industry of the future is what the EU is setting out to create by implementation of their REACH regulation. As the UC Report makes abundantly clear, without taking similar steps, California and the U.S. risk being left behind.</p> <p>To remedy the market failures being caused by the Data Gap, California should require the chemicals industry to provide to the public and government a basic level of health and safety information about its products as a condition of entering and remaining in the public marketplace. The information must be reliable and it must be comprehensive, that is, sufficient to permit the reasonable evaluation of the safety of chemicals for human health and the environment. It must be a firm, mandatory requirement that applies to existing as well as new chemicals. There must be an established deadline for provision of the required information for chemicals already on the market. The intellectual property value of the discovery of safer chemicals should be recognized while also providing for the public's need to know. Some government oversight of data quality may be required, but excessive intrusion into the industry development process should be avoided. These and other elements of a data requirement are discussed in more detail in Guth, J., Denison R. and Sass, J., "Require Comprehensive Safety Data For All Chemicals," Background Paper for Reform No. 5 of the Louisville Charter for Safer Chemicals (2005) (www.louisvillecharter.org), to be published in 2007 in New Solutions Journal.</p> <p>While a federal program to close the Data Gap may have advantages, it is in California's interest and well within its capability to take meaningful, targeted steps toward closing the Data Gap that would significantly improve the operation of the chemicals market in California. There are many ways the State could target its efforts.</p> <ul style="list-style-type: none"> • California could focus on closing the Data Gap for chemicals sold at high volume within the State. The targeted chemicals could be further limited by targeting chemicals that also have a high volume within the United States to ensure chemicals bearing the burden of the information requirement have a national economic base. • California could tier the required data sets according to volume in commerce, as in REACH. • The required data sets could be structured as stepwise requirements wherein further data would only be required if warranted by reliable screening level data. • The required data could be harmonized with other data requirements, such as those of REACH. For example, California could require that manufacturers of California high volume chemicals provide the REACH high volume data set to the state and the public. • California may be able to devise more efficient and more useful tests than those employed by REACH. State entities such as California's Office of Environmental Health Hazard Assessment (OEHHA) have considerable expertise that the state could draw on to consider this possibility. <p>Conclusion</p> <p>Green chemistry has enormous technological potential. But this potential will not be fully realized across the breadth of our economy unless the market motivates industry to invest in green chemistry at a scale that is commensurate with both the industry's resources and with what is at stake for our society. This requires the market to provide commercial rewards to those who develop safer alternatives. The market cannot provide these rewards unless all those who demand safer chemicals are able to evaluate the safety of the chemicals in the market.</p> <p>Established chemical companies will resist this analysis. Nevertheless, the Green Chemistry Initiative should envision and seek to foster a chemicals market that is capable of steadily innovating incrementally safer chemicals in response to market demand. It should seek to foster a market that looks like many other competitive markets in California, such as the electronics and biotechnology industries. In those evolving and competitive industries, the industrial sector itself remains strong even though individual companies regularly relinquish their market leadership and decline because they fail to remain on the cutting edge. The Green Chemistry Initiative should focus on the strength of the chemicals industry and on the needs of society as a whole, not the continued strength of existing dominant companies and their existing products.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>The full success of green chemistry requires the Data Gap to be closed. California should take steps to close it.</p> <p>Joseph H. Guth, Ph.D., J.D. Legal Director Science & Environmental Health Network (510) 559-3496 www.sehn.org joe@sehn.org</p>
F-GC-83	<p>the shift in the tide will occur when this happens..... go back in time prior to the petro/benzine/chemical revolution... dow/basf/union carbide/rpm/betco/cheveron etc. were not in business... once in business they all made tons of money hocking their wares once the money was made by convincing you of "better living through chemistry"...there was to be no turning back....until now..or recently.... the awareness of chemicals actually not being good for you or the environment seemingly a slow process of understanding by the general public....of course because those that profit from the creation of said chemicals have no reason to shoot themselves in the foot...and the general public is overall of a low i.q, watches to much t.v and would expect the government to inform them of such risk, if it existed...but of course it does....its just not presented as such based on our lobby driven style of politics... so where does this leave us.... with a bunch of 100+ year old companies making billions of dollars a year with absolutely no incentive to stop profiting on their products...they only "poke" at green chemistry in the guise of seeming like they are generally concerned and doing something about it....they are not...the stewardship programs are smoke and mirrors intended to give the impression that their "on it"...they only change when its mandated by the feds... the only way it will change is by people slowly becoming aware that these things are destroying the earth slowly...this will create fear....fear will create change....as seen with the fear of global warming. and.... when the counter insurgency happens... what is that you ask... its when pioneers such as myself create a substantial amount of clout by creating "anti chemical chemical companies" that are profitable...only once money powerful green companies exist will they be able to stand up against "them" and create change...not with the green chemistry...but with the money lets just take the residential building industry and all the chemicals used in the building of residential homes... are they needed?....were not homes built prior to the chemical petro revolution "sound"....of course they were, not only that they last and have lasted much longer than modern homes built using chemicals...well gee i thought all these chemicals were supposed to make the homes last longer and be better....or is it just that those that produce these products have quashed old technology that worked just fine, because of course they could not make money from it....in with our new chemicals out with the old things that worked just fine....why, because we can make a buck on it....and soon enough those that remember the way it used to be done die,and the new chemical way takes over... the police can not police the police... i suggest incentive programs for NEW inventors and companies outside of the "chemical kings" court...</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>"they" have too much lobby money to have any heavy mandates placed on them... to think outside of the box...your going to have to create a new one.... start at the uc's and private sector people are slow to change when their drunk on ethonol spiked with m.e.k and methonol, saturated with pfa's and drinking water laced with mtbe.....</p>
F-GC-84	<p>Risk-Based Evaluation – the One Approach that Makes Sense Chemistry has enabled the development of countless products that consumers use each and every day, and consumers want to understand what impact these products may have on the environment and on their health. Industry shares this desire, and continues to strive to develop, produce and market products that are both beneficial and safe for people and the environment. Given the complex and multifaceted technical, societal and policy elements that are inherent in the design, manufacture, use and disposal of these products, one must consider a number of factors to effectively assure their safety. Approaches to safety that are performance based and flexible will provide the greatest benefits and allow the development of innovative approaches within the context of California's Green Chemistry Initiative. Industry works to minimize exposure of workers and the public to all chemicals that could be considered hazardous as used, and we pay particular attention to chemicals considered to be hazardous to humans or the environment. At the same time, industry uses chemicals that are least hazardous, and thus require the least expense in worker and public safeguards, consistent with the production of effective and economically accessible products. The two halves of risk--hazard and exposure--are always part of our planning and never far from our minds. Approaches that utilize risk-based evaluations of chemicals to determine efficacy and safety should serve as the foundation for decision making within programs that flow from the California Green Chemistry Initiative. While the toxicity of a substance is an important consideration in a risk based evaluation, the potential for toxicity must be considered in the context of exposure--including exposure level, route, duration and timing. Every substance can produce toxicity under certain exposure conditions. Even common-place substances usually thought of as benign, such as water and table salt, can cause death when ingested at too high a dose over short periods of time. Conversely, even the most toxic substances pose virtually no risk when releases are controlled and exposures are minimized to levels below which, given an adequate margin of safety afforded by risk assessment techniques, the doses will not elicit adverse effects. For example, arsine gas is used to make microcontroller and microprocessor chips, and although arsine gas is highly toxic when inhaled, its "presence" in semiconductor chips in products used in every day life--computers, calculators, appliance microprocessors--poses no health hazards or risks from in-home normal and customary uses. So the question is not just, "How do we control toxic substances?", but also how do we successfully manage both toxicity and exposure--risk--while providing the solutions society needs? The answers to these questions are best provided through: 1) Risk assessment methods that integrate knowledge regarding potential hazards of chemicals with an understanding of their uses and exposures; 2) Product stewardship and risk management programs that establish mechanisms to assure exposures remain in the safe region for typical uses and foreseeable misuses; and 3) Laws and regulations that: • are science-based, • balance potential risks with benefits, • factor in existing scientific knowledge as well as reasonable uncertainties, and • consider the degree of risk to people and the environment.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-85	<p>Green Clean Renewable Energy Generated On-Site A breakthrough technology providing a green renewable hydrogen fuel requiring no carbon based fossil fuel nor utility electricity for its generation yielding neither CO₂ nor any other polluting and greenhouse emissions. For more information: http://www.dtsc.ca.gov/PollutionPrevention/GreenChemistryInitiative/Archive.cfm Posted by Green Chemistry team on behalf of Thomas W. Oakes</p>
F-GC-86	<p>Risk Assessment Methodologies (RAM) Technical Committee The overall mission of the RAM committee is to augment current exposure and risk assessment methods and model development efforts through projects, workshops, and scientific symposia aimed at addressing critical issues such as data needs, data characterization, and model evaluation. For more information: http://dtsc-cm/PollutionPrevention/GreenChemistryInitiative/Archive.cfm Posted by Green Chemistry team on Behalf of the Risk Assessment Methodologies (RAM) Technical Committee</p>
F-GC-87	<p>Quantitative Assessments of "Green" Munitions and Chemicals of Concern For many years, the Department of Defense (DOD) has made a concerted effort to reduce the potential impact of munition constituent and other chemicals on human health and the environment. In 2000, the U.S. Army Defense Ammunition Center (DAC) began working with Chemical Compliance Systems, Inc. (CCS) to use CCS's extensive centralized Relational Chemical and Product Databases as the basis for a series of integrated, web-based modules within what has become the Munitions Analytical Compliance Suite (MACS). (CCS's centralized databases included over 650 regulatory lists.) MACS includes eight modules. In a few months, the 9th and 10th automated modules the Emissions Risk Assessment and Human Health Risk Assessment--will be added. The most comprehensive of the MACS modules is the "Green" Munitions Analytical Compliance System (G-MACS). CCS developed G-MACS for DAC and PEO Ammunition Office in 2003. DAC and CCS co-own G-MACS, which has been available to 13 military munitions demilitarization facilities and two munitions management offices from coast to coast since its development. Military munitions design engineers can use the G-MACS's 43 quantitative ecological, health and safety criteria (Endpoint Criteria) to eliminate or reduce the use of hazardous munitions constituents to create a theoretical munition composition that substitutes alternative components, parts or chemicals, and calculates the "green" grade for the total, component, or part composition in 5 to 20 seconds. G-MACS can also quickly identify which munition constituents have an impact on any of 112 state, federal or international regulations. This electronic design capability greatly reduces the labor and time required to design a "greener" munition. G-MACS also has application to other munitions activities (e.g., acquisition handling, demilitarization). Using a munition's National Stock Number (NSN), G-MACS can calculate a munition's overall "green" grade, its ecological, health and safety scores, and the 43 Endpoint Criteria scores within five to 10 seconds. Because all scores are normalized on a scale from 0 (worst) to 100 (best), comparisons of the "greenness" of two (or more) munitions is easy and quantitative. The evaluator can view individual scores, from worst to best, as a means to determine those constituents that need to be replaced to improve the "green" grade. When G-MACS is combined with CCS's proprietary "Green" Process Analytical Compliance System (G-PACS) the four stages of a product life cycle (i.e., design; manufacture; stockpile management [e.g., handling, transportation, storage]; and disposal) can be evaluated. G-PACS uses the same 43 Endpoint Criteria as G-MACS, but analyzes the chemicals used in each step of the manufacturing process, or wastestream, rather than the constituents used in a munition. The MACS Chemicals of Concern (MACS-COC) module combines the objective and quantitative 43 Endpoint Criteria with quantitative Regulatory Impact and Inventory On-Hand Criteria to calculate a ranked Level of Concern listing for any facility's inventory. This prioritized list can be beneficial in decision making, particularly in regard to inventory management, pollution prevention, and cleanup.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>I strongly recommend California evaluate CCS's capabilities for application as part of California's Green Chemistry Initiative. I believe California's efforts will benefit from use of CCS's capabilities. CCS's web-based capabilities, their innovative approach, and their willingness to develop new or modified, integrated capabilities has proven beneficial to the Army's efforts to both be good stewards of the environment and to implement its sustainability program. Although I have not used them, I am aware of CCS's non-munitions capabilities, and believe that they would prove to provide tools of value to the civilian community and decision makers.</p>
F-GC-88	<p>Consider Eco endpoints in green chemistry initiative At the suggested of Bill, I would like to offer the following comments. When the impacts of harmful chemicals are evaluated, ecological effects as well as human health effects of toxic materials should be considered. It might be helpful to develop a simple searchable spreadsheet for your audience containing info on the current chemical, why it is harmful to human and ecological health, and what alternatives are available. Even starting with 25 chemicals would be a place to begin; more chemicals could be added on a quarterly/yearly basis. It might also useful to develop factsheets for your audience describing each of the chemicals of concern, their effects, and possible solutions/alternatives. Hope some of these ideas might be helpful. Barbara OEHHA</p>
F-GC-89	<p>not good enough for me... the problem is the word "chemistry".... what this implies if a VERY SOPHISTICATED LEVEL OF KNOWLEDGE... a level that the average consumer or person does not have...this then allows "bamboozelry" to occur.... for example go to TOXINET.COM type in any nasty chemical, lets say poly functional azridine or stoddard solvent...here we have a cumulative assessment of these compounds with their respective potential health and environmental "issues"...i guarantee you any of these potential concerns are not that your hair will grow thicker and you'll have slimmer hips and thighs....no its more like, well were pretty sure this stuff is a sensitizer and that it probably causes cancer....but because were just a bunch of independent phd's presenting facts gathered from patients and environmental studies we have no cohesive voice....so , well we'll just post our findings here and let people who are concerned stumble on the info.... how bout, who let them start circulating these chemicals anyway?...funny how "things" not governed by the fda {stuff that goes directly into your body} don't really have that many hurdles to jump over before they can hit the market in any variety of forms.... AND MANY OF THEM NOT NEEDED.... the household cleaning racket as well as the building materials/coatings racket are perfect examples of chemicals being invented before there was a use for them, then creating a use for them, that use being of course a dramatic improvement over whatever was being done before...ya right then theres the fact that the sway tips towards the guys saying" ya this stuff we invented...its great...it will make this better...so were gonna put it in this and sell it"....vrs. the phd who says i dunno this stuff might cause cancer....lets not even get into food additives so the information is all there if you want to find it... the question is WHY were any of these chemicals allowed to be marketed in the first place?...chemicals invented, then coming up with a need for that chemical is purely about money...</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
	<p>your not being "scared" or allowed to be scared is lobby money keeping the kibosh on public education about "potential" problem chemicals, "they" side with the manufacturer, not the guy who says its killing you....</p> <p>only when "fear" enters the picture do people respond..."fear of lead, fear of plastic leeching chemicals, etc.</p> <p>if in some hypothetical netherworld we could create a talking label{many people are too lazy to read good books let alone product labels} talking labels that started listing off all the potential health and environmental effects...i have a feeling many of those products would not sell...</p>
F-GC-90	<p>Environmental Impact Database for Point-of-Purchase Access</p> <p>While many consumers have the desire to engage in sustainable purchasing, they do not have access to a central source of reliable information at the point of purchase — the moment when they actually buy a product. This information could be made available over existing infrastructures, such as that used by web-enabled cell phones. The GreenScanner Project - http://www.GreenScanner.net - is one such attempt. GreenScanner is a public database of information and opinions about the environmental friendliness of various products. Users are able to contribute any information they have, and to evaluate the information contributed by others. This database is then available to consumers with web-enabled phones - a potential purchaser could use his or her phone or PDA to scan the barcode of a particular product, and then view a unified rating of how environmentally friendly that product is. Thus GreenScanner can be used to promote sustainable purchasing at the time of purchase itself.</p> <p>GreenScanner's grassroots-based collection of information could be greatly supplemented by environmental information formally provided by the companies that produce the products. A central website containing links to company-supplied information would be an excellent source of information for GreenScanner, and Californian consumers as a whole. Companies who wish to do business in California could be required to provide this website with links to information about the chemical composition, production methods, and overall (projected) environmental impact of products they make. Having a common format for this information (similar to the Nutrition Facts on the back of foods) would allow for viable comparisons across products. GreenScanner would then be able to crawl this website, collecting the information and making it easily available to consumers at the point of purchase by delivering the information on demand to their web-enabled mobile device.</p>
F-GC-91	<p>How is this different from Design for the Environment?</p> <p>How is this different from the EPA Initiative in the early 1990's called "Design for the Environment" (DfE)? Are there lessons to be learned from that program? Has that been considered?</p> <p>Since this is not really a new idea, the real question is how can it be MORE successful than past attempts to reach the same goal?</p> <p>Historical research may be helpful.</p> <p>Linda Gianelli Pratt</p>
F-GC-92	<p>My thoughts are along the same line. Waste minimization became pollution prevention which begat green chemistry. Is this an evolution or renaming of a concept?</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-93	<p>Program Manager</p> <p>Today's Washington Post had an article about the spread of green chemistry programs at universities (http://www.washingtonpost.com/wp-dyn/content/article/2007/10/09/AR2007100900247.html) Though the number is still very small (about a dozen programs), it's a start. No Calif. college or university was mentioned. I agree with those who have mentioned creating univ. programs to develop green chemistry expertise and professionals in the state as a way to drive this issue. The article even mentions a university program that is teaching high school teachers green chemistry principles for them to bring back to their students at an earlier age.</p> <p>I have not been aware of any participation at the GCI workshops of university administrative leaders or chemistry dept. It would seem appropriate that DTSC specifically reach out to our key universities, both public and private, and invite them to participate. I also would suggest a specific meeting to discuss with such leaders how to create green chem. programs or integrate its principles into the current curriculum. Please include other stakeholders in that conversation, so that these academics get a well rounded picture of what is needed.</p>
F-GC-94	<p>Green Chemistry & Product Stewardship</p> <p>The California Green Chemistry Initiative is defined by DTSC as an effort to stimulate a "transformation in the design of products and processes." Interestingly, DTSC's leading recommendation for bloggers ("...Consider public health and the environmental effects of chemicals during the process of designing products and industrial processes...") could have been lifted directly from the American Chemistry Council's Responsible Care® product stewardship program – a program which has been in place since 1991, more than 15 years before California's initiative. All members of the American Chemistry Council, which represents the leading companies engaged in the business of chemistry, participate in Responsible Care® as a requirement of membership in ACC.</p> <p>"Green chemistry" is product stewardship done right. It is the practice of making health, safety and environmental protection an integral part of the full life cycle of chemical products, including design and manufacture. Under Responsible Care®, this includes evaluations of chemical products and their uses to help assure that those products deliver their intended benefits to society while protecting public health and the environment. Responsible Care® requires our members to employ rigorous management systems that are certified by third-party auditors. In addition to numerous other elements, those auditors certify that our companies have systems to manage risk associated with chemical products and that those systems include management of product development, transport, use and disposal in a safe and secure manner. Companies are also audited on their programs to protect the environment and conserve programs, as well as processes to dialogue with stakeholders about the organization's impact on human health and the environment. Companies' performance under Responsible Care® is publicly shared with the public through a first-of-its-kind website: americanchemistry/responsiblecare.com.</p> <p>Reducing hazardous materials in products and processes is also simply good business sense. Hazardous materials cost companies money in additional storage, transportation and disposal fees, as well as additional cost for protecting their work force through engineering controls and personal protective equipment.</p> <p>DTSC and the public can obtain more information on what the chemical industry has been doing in the Responsible Care® program from http://www.responsiblecaretoolkit.com.</p> <p>It's critical that DTSC's recommendations to CalEPA in the Green Chemistry Initiative recognize the value and role of industry stewardship programs, and create incentives for others to take similar steps. This is particularly true through the entire value chain, up to and including end users of chemicals and the products made from chemistry.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-95	<p> Biomonitoring should be a part of the green chemistry policy Biomonitoring should be a part of the green chemistry policy as a feedback and as part of a Plan-Do-Check-Act management system. EPA Research Grants News Release (HQ): Protecting Americans through Better Chemical Exposure Monitoring Protecting Americans through Better Chemical Exposure Monitoring Contact Information: Suzanne Ackerman, (202) 564-4355 / ackerman.suzanne@epa.gov EPA announced \$4 million in grants to five institutions that will work on improving biomonitoring at the Public Health Applications of Human Biomonitoring Meeting. The meeting of experts was sponsored by EPA and the International Council of Chemical Associations (ICCA) Monday and Tuesday at EPA's Research Triangle Park campus. "Protecting public health is an important part of this research and EPA's mission," said George Gray, assistant administrator for EPA's Office of Research and Development. "Biomarkers can help us understand the connections between human exposure, dose, and health effects, and the work EPA is funding will help improve our understanding of how the Agency can use biomarkers to protect human health and the environment." Biomonitoring is the measurement of toxins in people by testing specimens such as blood and urine. Such measuring is critical to tracking public health and establishing public health and environmental policies. Biomarkers are the types of measurements done that show the presence of a chemical. For example, cotinine is a biomarker of exposure to cigarette smoke. Much more work remains to be done to develop other reliable biomarkers, and these grants will further this important endeavor. Biomonitoring also helps federal agencies determine where the U.S. is making progress in reducing exposure to harmful chemicals and where more work needs to be done. CDC's annual biomonitoring report, "National Report on Human Exposure to Environmental Chemicals" (NHANES), showed that people's exposure to secondhand smoke has been greatly reduced, and blood lead levels in children are way down. The five EPA Science to Achieve Results (STAR) research grants will be used to develop computer models that can match biomarkers with exposure and/or dose for many chemicals including chlorpyrifos, diazinon, parathion, carbaryl, perfluorooctanoate (PFOA) and perfluorooctanesulfonate (PFOS). The research results will allow scientists and risk assessors to understand more about the meaning of biomarkers resulting from exposure to these insecticides and fire retardants. EPA's STAR program funds research grants and graduate fellowships in many environmental science and engineering disciplines through a competitive solicitation process and independent peer review. The program engages the nation's best scientists and engineers in targeted research that complements EPA's own research programs and those of our partners in other federal agencies. <http://www.epa.gov/ncer/07biomarkers> More information about the grants: epa.gov/ncer/07biomarkers <http://www.epa.gov/ncer> More information about the STAR grants program: epa.gov/ncer <http://epa.gov/hhrp/> More information about EPA's human health research program: <http://www.epa.gov/ord/npd/hhrp/> epa.gov/hhrp/ The grants funded by EPA were awarded to: * The Hamner Institutes, Research Triangle Park, N.C., \$750,000 - Develop a new model to interpret biomarkers of exposure for carbaryl, a carbamate insecticide used on many crops. * Clark University, Worcester, Mass., \$677,499 - Use models to derive a developmental reference dose and/or acceptable daily intake for the organophosphate pesticide chlorpyrifos. * Colorado State University, Fort Collins, Colo., \$748,582 - Develop a new model to interpret biomarkers of exposure for chlorpyrifos and diazinon, two organophosphate (OP) insecticides. * The LifeLine Group, Inc., Annandale, Va., \$749,991 - Link exposure and models as a method to characterize the relationships between exposures and biomarker levels of two perfluorinated compounds, perfluorooctanoate (PFOA) and perfluorooctanesulfonate (PFOS). </p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>* University at Buffalo, Buffalo, N.Y., \$749,612 - Improve existing models to better estimate exposures, target tissue dose and resulting effects in human populations, using biomarker data for the organophosphate pesticides chlorpyrifos, parathion, methyl parathion, and diazinon. Note: If a link above doesn't work, please copy and paste the URL into a browser.</p>
F-GC-96	<p>Quantitative Web-based "Green" Munitions Analyses The United States Army Defense Ammunition Center (DAC) has partnered with Chemical Compliance Systems, Inc. (CCS) to develop munition analytical compliance capabilities for the past eight years. Along with other DOD organizations, in 2003, DAC contracted CCS to develop a tool that would assist the Army in efforts to assess munitions from a "green" perspective. What came out of this was a Web-based tool known as the "Green" Munitions Analytical Compliance System, or G-MACS. Since no green criteria had previously been established for munitions, or any other product, the development of G-MACS by CCS with 43 ecological health and safety "green" criteria made a giant step forward in helping our design and manufacturing installations with an automated capability to assess the "greenness" of munition constituents early in the life cycle. The "green" scoring criteria in G-MACS was programmed to be flexible and dynamic enough to be modified as needed to support any environmental factors and/or guidelines on "greenness" that might be developed. G-MACS is unique in that it can, in combination with the CCS "Green" Process Analytical Compliance System (G-PACS), be used to "score" a munition for "greenness" throughout the life cycle (cradle to cradle). G-MACS, along with other CCS systems such as their "Green" Product Compliance Analytical System (GP-CAS), and "Green" Process Analytical Compliance System (G-PACS), could be utilized to provide a complete life cycle "green" product measuring tool that not only covers munition constituents but also, paints, pharmaceuticals, cleaning products, pure chemicals, etc. After a number of years of working with CCS and knowing the tools that they developed such as MACS and G-MACS, DAC is confident that the State of California could benefit by utilizing CCS and their GP-CAS, G-PACS and G-MACS Web-based tools.</p>
F-GC-97	<p>ACC's Perspectives on California's Green Chemistry Initiative The business of American chemistry is built on fundamental science. As a result, the members of the American Chemistry Council (ACC) support science and risk based chemical management policies that simultaneously protect health and the environment, assure product safety and promote innovation in the marketplace. Our industry has always relied upon innovation in its development of products and processes to meet customer needs and expectations, address new regulatory requirements, and to fulfill voluntary commitments to programs that go beyond the law. It's important to note that "Green Chemistry" is a way of doing business was never intended to be applied as a government mandate through regulation or legislation. Indeed, the American Chemical Society's Green Chemistry Institute states: "Green Chemistry differs from previous approaches to many environmental issues. Rather than using regulatory restrictions, it unleashes the creativity and innovation of our scientists and engineers in designing and discovering the next generation of chemicals and materials so that they provide increased performance and increased value while meeting all goals to protect and enhance human health and the environment." So how should California approach green chemistry? We think there are a number of threshold issues DTSC must be prepared to address in making recommendations on the basis of this initiative:</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
	<p>1. Make a baseline assessment of chemical information that is already available to the State. In ACC's view, there is a lot of information already publicly available on chemicals in commerce, and a lot more coming on line, from other States, the federal government, foreign governments, intergovernmental organizations, and even non-governmental organizations (including industry). DTSC should be studying the availability of data now, particularly the availability of both hazard and exposure data, so that risk determinations can drive decision making. It simply makes sense for California to coordinate on information needs with other governments and other sources of information – why reinvent the wheel? More importantly, DTSC doesn't have to wait until the end of its Green Chemistry Initiative to get the ball rolling on this important element.</p> <p>2. Reiterate the commitment that the Green Chemistry Initiative will be governed by science. Many entries in the "Conversation with California" appear to be based on an underlying assumption that the current design of products and manufacturing processes is not adequately protective of health and the environment, and recommend that DTSC suggest hazard-based approaches to decision making. That's not good policy. As DTSC acknowledged in the launch of the Initiative, science should govern the process. Americans (and Californians) are living longer, healthier, and safer lives than ever before, and significant improvements have been made in public health and the environment. An extensive legal and regulatory framework, coupled with myriad voluntary programs, initiatives and innovations, has led to those advances in health and the environment. We hope that the Green Chemistry Initiative will examine the basis for the assumptions about the adequacy of current protective measures as policy options are identified.</p> <p>3. Commit to understand both the burdens and benefits of new regulatory proposals. One University of California report on chemical regulation in California noted that businesses in California labor under a "labyrinth" of rules enforced by a number of agencies. Interestingly, many of the entries in the "Conversation with California" argue that even more regulation is necessary! Some have referred to Europe's new REACH regulation as the solution – taking the interesting position that a regulatory program that is not yet even operating is now a benchmark for chemical regulation.</p> <p>4. Acknowledge that engineering is a part of "green chemistry." ACC member companies are leaders in green chemistry and green engineering in their operations and have been honored for their efforts. Modifications in process technology have significant potential to minimize possible adverse health or environmental effects of chemical substances. Many of the entries in the "Conversation with California" appear to focus largely on promoting product substitution – the simplistic substitution of one hazardous chemical for a less hazardous alternative – without regard to the consequences of such an approach, and without recognizing the important role that process improvements can have. It's time DTSC made clear in this dialogue that engineering is every bit as important as product improvements.</p> <p>ACC and its member companies believe that the Conversation with California should address a number of the complex, specific issues that are implicated by the Initiative. In the weeks ahead, we intend to address issues like the role of product stewardship, the role of regulation in promoting innovation, how California might stimulate "green chemistry" and "green engineering", and the four broad categories on which DTSC has invited specific comment.</p> <p>Mike Walls Managing Director, Regulatory and Technical Affairs American Chemistry Council</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-98	<p>Quantitative Green Ranking for All Chemicals</p> <p>A database has been created with over 220,000 chemicals (all listed to date) and all cross reference names with filters for all state and federal regulatory lists. Each chemical has assigned the 33 federal EPA Environmentally Preferred Characteristics (EPP) and additional credible Characteristics given by regulatory agencies CAL EPA, other key USA states and key countries totaling 41 key environmental performance characteristics (e.g. LD 50, excess lifetime cancer risk, flammability, health hazardard indicies etc). These characteristics may be organized into three categories Ecology, Human Health and Safety. This database, updated annually, contains over 75,000,000 elements to rank products as a function of the chemicals and chemical percentages. For each environmental characteristic, the chemical that is least compatable with living systems is given a score zero and the most compatable the score one hundred. The scores in between are normalized so that each chemical (all 220,000) has a quantitative normalized score.</p> <p>The navy tested eight adhesives meeting MIL-SPEC by providing the chemicals that make up the products. The chemicals were tranmitted via the on-station web site database of products Hazardous Material Management System (HMMS) to Chemical Compliance System's (CCS; www.chemply.com) web site. A report of all 41 Environmental Characteristics was automatically generated, and with equal weights as the default mode, a normalized score for Ecology, Human Health and Safety and an overall Environmental Score (Green Rank Score to make the best decision for the environment).</p> <p>This tool may be used for face cream, road paint, military aircraft munitions or paint, any product with a list of chemicals and percentage created a true quantitative score.</p> <p>This tool may be utilized by acedemia, government, industry, householders, military etc to formulate-design and or determine the best products compatable with the ecology, human health and safety.</p> <p>The vision is that the state of California purchases the tool for the USA to be utilized for no cost by all so that the environmental may improve rapidly. This would become the biggest pollution prevention project ever and the most cost effective to reduce pollution through source reduction. The federal EPA may also participate. With this tool in place via a web site sponsered by CAL EPA and or FED EPA, the products most compatible with the ecology, human health and safety may be chosen by the consumer. Also, formulations by acedemia, the govenment, industry etc may be optimized for environmental compatability. The user simply imputs the chemical makeup of a product and the web site generates a complete report of the EPA EPP chacteristics (and others from the key state and countries if desired) and a normalized score for the ecology, human health and safety and a total environmental score (green rank). This would be easy to put the information into a green label.</p> <p>Dr. George Thompson, PHD in Chemical Engineering developed this tool taking over 25 years for the DOD through a company www.chemply.com. The rest of the nation should benefit from this significant work.</p>
F-GC-99	<p>Green Chemistry Initiative should not be used to oppose efforts to reduce exposures to toxic chemicals</p> <p>One of the guiding principles of any green chemistry policy will be to protect public health. This will inevitably lead to prevention of exposures to certain chemicals and classes of chemicals that, e.g., cause cancer or affect reproduction or the endocrine system. While one would hope that the Green Chemistry Initiative (GCI) will be operational as soon as possible, realistically it will be years before there is any legislative authorization for the development of appropriate regulations or guidelines. Therefore, in the interim, it is inimical to public health and to the interests of the people of California for DTSC or other departments to oppose legislative or other efforts to restrict exposures to toxic chemicals on the basis that the Green Chemistry Initiative will be in place one day.</p>
F-GC-100	<p>amen...from one who is polyfuntional azridine'ized</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
F-GC-101	<p>Lord Professor of Chemistry Again, protect the contents of the cradle.</p> <ul style="list-style-type: none"> • invest in green chemistry R&D to develop leading university centers • invest in EDC research so that the knowledge obtained can be used to underpin the development of green chemistry • encourage collaborative work between green chemists and EDC researchers to foster strategies for avoiding EDCs in new products • promote public education into the dangers of EDCs and the need for green chemical approaches to designing alternative products
F-GC-102	<p>Summary of the Green Chemistry panel at the Society of Environmental Journalists National Conference The Society of Environmental Journalists sponsored a Green Chemistry panel on Sept. 8 as part of its National Conference at Stanford. The session, well attended by journalists from across the country, included panelists Mike Wilson of U.C. Berkeley; John Mclsaac of Columbia Forest Products; Jennifer Harris from XenoPort and the Silicon Valley Leadership Group; and Mark Schapiro of the Center for Investigative Reporting. Marla Cone of the Los Angeles Times was moderator of the panel. Here are some of the key issues and emerging options offered by the panelists:</p> <ul style="list-style-type: none"> - In his new book, "Exposed: The toxic chemistry of everyday products and what's at stake for American power," Schapiro warns that U.S. consumers are becoming a "dumping ground" for goods – from cosmetics to plastics to toys to electronics – that a growing number of nations deem too toxic for their citizens. New regulations adopted in the European Union, the world's largest economic trading bloc, are increasingly being adopted in other nations, including China and Mexico, as global environmental protection and leadership shifts from Washington to Brussels. He said that, absent complete information, consumers are unable to make informed choices, an example of market failure. - Wilson said changes in industrial chemistry will require a massive shift in the industrial-chemical sector as industry enters an "unchartered wilderness." He said China, Japan, South Korea and Europe are moving rapidly to adopt Green Chemistry practices. He called for reforms to state and U.S. laws to fix: the data gap, so companies disclose toxic substances to workers and consumers; the safety gap, so government can use the toxic substance information to identify and prioritize chemical risks; the technology gap, so business, government and academia can innovate green chemistry technologies. He described the establishment of a Consortium on Green Chemistry at UC Berkeley, possibly headed by a Dow Chemical executive. He said the California Dept. of Toxic Substances Control Division will need to expand its staff to launch a Green Chemistry program. - Harris praised the California Dept. of Toxic Substances Control Division Green Chemistry initiative, but questioned whether it will be an ongoing dialogue or a series of regulations. She also questioned how to integrate Green Chemistry into curriculum, research and development, finance and engineering. She asked whether small businesses should be included in a Green Chemistry program. She urged more education for business groups and involvement of UC Extension. - Mclsaac recounted the intense opposition his company faced from its trade organization and the chemical industry when it replaced formaldehyde in plywood with a soy-based adhesive. He said continued industry resistance to new, anti-formaldehyde regulations adopted by the California Air Resources Board slows introduction of clean, new products that he says perform just as well as the more toxic products that were replaced. Meanwhile, he described how Chinese companies continue to ship large amounts of formaldehyde-soaked plywood to the United States, though the product is banned for use in the EU and China.
F-GC-103	<p>How to Stimulate Green Chemistry: Regulatory/Statutory Requirements Regulatory/Statutory Requirements: Should there be requirements placed on labeling 'green' products, similar how the term 'organic' is allowed to be used in foods? Are there better models?</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
F-GC-104	<p>I think a criteria similar to that used for Green Buildings/LEED Certification would work for certifying green products. With the LEED Green Building certification there is a rating system to define and measure green buildings based on their meeting requirements in certain green areas. Each green area (sustainable site, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and innovation and design) has a certain number of possible points. There are different options for earning points within each area and you have to earn a set number of points to qualify for the LEED Green building certification. I believe that there are different levels of green that you can achieve for the LEED certification.</p> <p>Green product certification/ labelling requirements could be based on a similar system. For this system the green areas may include use of green energy during manufacturing, waste generation, use of recyclable materials, use of non-toxic ingredients, etc.</p>
F-GC-105	<p>Legislative Changes</p> <p>I have conducted research on safer alternatives for the last 30 years. Over the last 17 years, my organization, the Institute for Research and Technical Assistance (IRTA), has identified, tested, developed and demonstrated safer alternatives in a range of different applications and industries. Over that period, IRTA has assisted hundreds of facilities in California in adopting alternatives. IRTA has worked on alternatives in dry cleaning, repair and maintenance cleaning, handwipe cleaning, batch loaded cold cleaning, electronics cleaning, vapor degreasing, printing cleanup, paint stripping, coatings and adhesives. In some cases, whole industries have adopted alternatives developed and tested by IRTA.</p> <p>Over the course of this work, I have learned much about how the system works and have become aware that, in order to ensure that safer alternatives are used, legislative changes are required. First, California needs a California Toxic Substances Control Act (CAL TSCA). CAL TSCA would require all new chemicals sold into California to be tested for toxicity before they are marketed. A set of toxicity tests that would be required would be developed by a consensus group of toxicologists with input from DTSC and the public. The manufacturers or distributors would have to conduct these toxicity tests at their own expense. CAL TSCA would also establish a set of toxicity tests that would be required for existing chemicals, chemicals that are already being used and marketed in California. In a few cases, the toxicity test information would already be available; in other cases, the tests would have to be performed. When the toxicity test data were provided by the manufacturers or suppliers, DTSC, with the help of the Office of Environmental Health Hazard Assessment (OEHHA), would evaluate the results and decide whether the chemical could be marketed (new chemicals) or whether the chemical would have to be removed from the market (existing chemicals). The criteria for deciding on this up or down vote would be predetermined by the group of toxicologists who designed the tests and DTSC with public input.</p> <p>Many chemicals that have toxicity problems have come on the market in the last 10 years. These chemicals are used extensively and exposure of workers and community members is high. An example is n-propyl bromide (NPB). NPB is a reproductive toxin in animals and has also caused nerve damage. It is currently undergoing testing for carcinogenicity. When the chemical was first marketed, EPA did not require toxicity testing for the substance under Federal TSCA. The chemical has been listed on California's Proposition 65 but is not on the state toxics list. Cal/OSHA and Federal OSHA have not established worker exposure levels for the chemical. NPB is used in vapor degreasing. The dry cleaning industry is considering using it as a dry cleaning solvent and there is nothing that would prevent this. Once chemicals like NPB are on the market, there is no mechanism for preventing their use in dispersive applications. Adopting a CAL TSCA would allow the state to deal with chemicals like NPB.</p> <p>Second, OEHHA has the responsibility of determining whether chemicals pose an unacceptable risk and that agency has few resources. OEHHA's budget should be expanded substantially. Dry cleaners in the state have been using a dry cleaning solvent called D5 for several years and D5 has caused cancer in laboratory animals. OEHHA has been evaluating toxicity test results to determine whether D5 is a threat but has not completed their analysis. In the meantime, no regulatory agency can regulate D5 and the dry cleaning industry is using it extensively. Giving OEHHA more resources could speed the evaluation process and give high priority to the new work the agency would be called upon to do under CAL TSCA.</p> <p>Third, the California Air Resources Board (CARB) is limited in their regulatory authority and their authority should be expanded. CARB regulates consumer products but is forbidden from regulating away a whole product type. In other words, if a low-VOC or low toxicity nonaerosol product is available and could</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
	<p>substitute for a higher VOC more toxic aerosol product, CARB cannot regulate the VOC content or toxicity of the aerosol product on that basis. CARB can set a lower VOC limit or ban certain toxics in the aerosol product if there are other aerosol products with lower VOC content or no toxics. Aerosol products are inherently not green. They lead to a very large waste stream and they rely on propellants that are often VOCs or greenhouse gases. As an example, consider antiperspirants and deoderants. Roll on products have very low or no VOC content. In contrast, aerosol products have a higher VOC content and contain propellants that may be greenhouse gases or VOCs. Expanding CARB's authority would permit the agency to establish VOC and toxics limits based on the nonaerosol products. This would allow the state to forbid the use of aerosol products in cases where there are greener products. It would also allow CARB to forbid the use of certain toxics as determined under CAL TSCA as a threat.</p> <p>The three legislative suggestions described here would make it far easier to restrict the use of certain materials that cause problems for health and the environment. The strategy would provide an incentive for manufacturers and suppliers to find and market greener products. This would result in better protection of the health of consumers and workers and of the environment in California.</p>
F-GC-106	<p>How to Stimulate Green Chemistry: Technical Assistance/Information Dissemination Technical Assistance/Information Dissemination</p> <p>Are there priority industry sectors or product categories where the State should focus first in forming partnerships, developing guidance, etc.? What are the best models for businesses to use in doing 'safer chemical substitution' analyses?</p>
F-GC-107	<p>How to Stimulate Green Chemistry: Awards/Recognition Awards/Recognition:</p> <p>How can recognition or awards be used to encourage green chemistry? What types of recognition by government will be most effective?</p>
F-GC-108	<p>I believe that recognition of environmental achievements is a strong motivator for businesses, especially since environmental protection is such a concern to the general public. Just look at the number of buildings trying for the LEED Green Building certification. There is often a significant cost associated with achieving LEED certification, but many businesses are choosing to do so. Recognition of green products and receipt of "awards" would be an even stronger motivator because of the likelihood that having the award would lead to greater sales and preferential purchase by environmentally conscious consumers.</p> <p>I think that recognition accompanied by the right to display a logo that consumers could easily identify would be the most effective method, because it would more likely result in the preferential selection of the products by consumers. - See earlier blog on the German Blue Angel award and logo (www.Blauer-Engel.de)</p>
F-GC-109	<p>How to Stimulate Green Chemistry: Green Chemistry Education Green Chemistry Education:</p> <p>One suggestion has been that the university system should develop programs in green chemistry and engineering. Do you think this should be done? Any specific ideas? Could endowments or scholarships for the study of green chemistry play an important role?</p> <p>How about K-12 education? Should green chemistry concepts be taught in the classroom?</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-110	<p>How to Stimulate Green Chemistry: Consumer Choice/Market Forces Consumer Choices/Market Forces: The concept of government "leading by example" is sometimes cited as a positive factor to influence the wider application of new and more environmentally friendly activities. Do you believe these environmentally preferable purchasing programs by government and the use of green products and technologies can be a useful tool to stimulate green chemistry in California? What can be done to encourage consumers to purchase and/or demand safer products? Public service announcements such as anti-litter campaigns, fire prevention, and others have been used to encourage people to take or avoid certain actions. Should the government market 'Green Buying' to educate and encourage people to buy and use safer product or adopt safer practices? What kind of market research should be done – directed at consumers? Retailers? Wholesalers? Importers? Manufacturers? Some have suggested we are entering a phase of marketing where products and services may be promoted as 'green' to attract customers increasingly interested in product safety and the environment. If this is the case, what can be done to guard against this kind of "greenwashing" of products? What mechanisms should be put in place to ensure the validity of green product claims?</p>
F-GC-111	<p>While government Green Purchasing is a potentially powerful market driver, like any power tool it should be wielded with care. One area of concern that permeates issues of "green standards" and "green labeling" in general is the potential to unintentionally limit green innovation by our current definitions. That is to say, for the sake of regulations and purchasing criteria we might define "green" as being today's best practices. There are examples of companies who have invented something radically "greener" than anything previously known who could not be sourced under government green purchasing regs because the regulations defined green specifically in the older, ironically less green, mold. Thus the truly innovative, next generation green companies can end up being out-competed by their slower less green competitors. Thus how "green" is defined is very important - and very hard to do, since we can't use current best practices as the standard. Green Chemistry, moreover, is not a checklist for product attributes. It is a set of principles for creating next generation molecules and chemicals. It is inherently dynamic and assumes constant improvement and innovation. This is not to say there is no role for purchasing standards, but to be clear about where in the process different tools and regimes come in: while Green Chemistry frames innovation, purchasing standards at their most effective encourage constant improvement.</p>
F-GC-112	<p>I wonder if there is any research on the effect of Walmart's commercials regarding compact fluorescent lights on the increase in sales of those light bulbs. I see that commercial at least once a week. If there has been a significant increase in the purchase of those bulbs since Walmart started airing the ads then that would support the theory that consumers will choose environmentally friendly products if they are educated regarding the benefits of the products. With regard to a labelling system for green products, a system like the LEED Green Building Certification may allow for more flexibility in accomodating new technologies. With the LEED certification, buildings earn points within several different categories and a building needs to earn a minimum number of points to achieve the certification. Within each category there is a laundry list of different ways to earn points and the builders can choose which options are most practical and feasible for their building and budget. There are also different levels of certification based on the total number of points earned. Government agencies could establish procedures that require purchasing of green products that achieve a minimum number of points on the "green product rating system". As new technologies are developed, additional options for earning points could very easily be added to the laundry list of potential point options. Truly innovative methods could have a higher possible point value, thus making it easier to achieve certification or higher levels of certification.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
F-GC-113	<p>We believe government increasing the "lead by example" effort to be the best option for generating immediate results in the use of EPP products, across all markets.</p> <p>Our Emerging Tech Group is responsible for outreach and demand management associated with a recycled cotton insulation product - an alternative to traditional materials that have dominated the building insulation market for decades.</p> <p>Use of the recycled denim product creates conformance with the provisions of a cradle-to-cradle framework. Positives are also realized in raw material resource & energy conservation, air quality, public/occupational health, pesticide use, and overall release of toxics. The downside is the base cost, however minute the variation. If incorporating life-cycle, environmental impact, and risk management analysis - a "no-brainer" prevails.</p> <p>We find growth most in the consumer markets. They are driven by the value-added aspects and common sense comparisons, that coincidentally cross-over with the regulatory responsibilities of a majority of CALEPA's BDOs.</p> <p>The established private sector infrastructure hampers efforts to get the product mainstream in new residential development, commercial, and government building markets.</p> <p>Without the generation of a series of mandated standards that support the regulatory community, and the public sector in its efforts as a whole - other green technology innovations will find similar circumstances and an unchecked resistance on the part of grandfathered interests.</p>
F-GC-114	<p>How to Stimulate Green Chemistry: Economic Incentives</p> <p>Economic Incentives:</p> <p>What taxes or other incentives / disincentives should be considered to steer behavior towards green chemistry / green engineering? If you know of examples that have been effective elsewhere, please describe these. For example, would a program offering grants or low interest loans to retrofit equipment to accommodate 'greener' alternatives be effective? If so, what should be the priorities for targeting such grants?</p>
F-GC-115	<p>How to Stimulate Green Chemistry: Research</p> <p>Research:</p> <p>Are there specific areas of research that should be pursued by the State? What do you see as the highest priority information needs or data gaps that present obstacles to producing greener products and utilizing greener processes? Please provide ideas on the role that State can play in engaging in or promoting research to fill these gaps.</p> <p>Life Cycle Assessment (LCA) has been mentioned as an important tool for business (or government) to use in decision making, not only to help guide better environmental decisions, but also for the potential long-term economic advantages it may offer companies. How can more businesses be encouraged to conduct LCAs to guide key product design and production decisions?</p>
F-GC-116	<p>"Are there specific areas of research that should be pursued by the State?"</p> <p>first, start up our nuke program....stop burning coal and releasing thorium and uranium into the atmosphere as well as all the greenhouse gas....study the french and their program....and educate yourselves on the FACTS ABOUT IT.....one small accident {that no one died in} and the following movie silkwood seemed to destroy the program...based on hysteria and lack of FACTS...rethink and promote nuke...</p> <p>"How can more businesses be encouraged to conduct LCAs to guide key product design and production decisions?"</p> <p>make it possible for company's that don't have 8 figure established sales figures to be able to actually get some useful help...</p>
F-GC-117	<p>How to Stimulate Green Chemistry: Existing Models</p> <p>Existing Models:</p> <p>What specific provisions or elements of other programs – in other states, USEPA, internationally – should California consider adopting in order to stimulate green chemistry? Please cite references where possible.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (FORUM)

Number	Full Comment
F-GC-118	<p>Green logo on product packaging to identify green products</p> <p>I think that more and more people are becoming environmentally "aware" and concerned about the environment. If consumers were to be more informed about 1) the dangers of some chemicals used in industry and the environmental impact of some products like plastics and 2) knew how to find environmentally friendly alternatives and products - they would then gear their purchases towards those "green" products and manufacturers. The problem is that the general population has not had a lot of exposure to issues related to hazardous chemicals in products. Most environmental advertising is related to reducing air emissions and halting global warming. There has been very little public education on land and water pollution.</p> <p>I think that DTSC should develop a grading/ award system for products that meet certain green criteria. This could be a joint effort with other Cal EPA agencies that could include the use of green energy as well as green chemistry technologies. Products could be evaluated on the environmental impacts during manufacturing as well as impacts from the use of the product by the consumer. Those that meet certain green standards would earn the right to put a standard and easily recognizable "green" logo (which DTSC would create) on the product packaging that consumers could look for at the store. Maybe the award system would include different levels such as bronze, silver, gold and platinum based on how green they are. With advertising, the consumers could then know what to look for when trying to purchase environmentally friendly products. I believe given a simple system for identifying green products, consumers would choose those products at the store over those without the green logo. This would be similar to what the food manufacturers are trying to do as far as using simple symbols to illustrate the health benefits of certain foods.</p> <p>With enough consumers choosing products with the green logo, the manufacturers would then be motivated to invest more research and energy into the development of green products. Otherwise they may lose customers.</p> <p>I also think that DTSC should have more information on the public website geared towards the general public, particularly related to the purchase and use of certain products. There could be a page with lists of manufacturers and products that have received the DTSC "green" awards, which would further motivate manufacturers to use green technologies and submit their information to DTSC for review. The website should also include information about the environmental impacts of plastics, greener alternative to household chemicals, disposal options for universal waste and info on green chemistry. Currently some of this information is on the website in various places, but it is hard to find, especially if the general public isn't aware of issues and doesn't know to look for the information. Most of the DTSC site is geared towards consultants and generators, not the average Californian. There should be one large link on both the DTSC home page and the Cal EPA home page (and each of the other Cal/EPA agency sites) called "What can I do to help the environment?" that leads the average person to a page where they can find concise information regarding environmental issues and what they can do to help.</p> <p>The more that the general public is aware of these issues, the greater pressure they will put on manufacturers and legislatures to make green chemistry and environmental protection a priority. After becoming aware of some of the issues at the Green Chemistry Symposium I immediately emailed all my friends and family information on the subject. Several of us quickly bought several portable and washable water bottles to use instead of bottled water and we also bought dozens of reusable grocery bags. The very graphic images of plastics pollution made a strong impact on us and I believe it would do the same for most of the general public. We just need to get the word out. I have already noticed that some bottled water manufacturers are listening to the buzz about plastic. Some manufacturers are starting to use less plastic in their bottles and are advertising such on the packaging.</p>
F-GC-119	<p>There is an environmental certification in Germany called "The Blue Angel". http://www.blauer-engel.de/englisch/navigation/body_blauer_engel.htm</p> <p>It has been around since 1972 and about 3600 products have received this certification label.</p> <p>"the Blue Angel promotes the concerns of both environmental protection and consumer protection. Therefore it is awarded to products and services which are particularly beneficial for the environment in an all-round consideration and which also fulfil high standards of occupational health and safety and fitness for use. Economical use of raw materials, production, usage, service life and disposal – all these factors are assigned a high importance. Products which are awarded the label bear the logo of the Blue Angel directly on the product whereby service companies use it on materials used to offer their</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (FORUM)	
Number	Full Comment
	services."

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-1	<p>Cradle to Cradle: Through product design and industrial innovation, produce products that reduce the use of harmful chemicals, thus generating fewer emissions and less waste. How do you think California should move to a Cradle to Cradle framework?</p> <p>California needs to carefully review and identify with stakeholders the current significant barriers that impede investment in, and adoption of, sustainable technologies. Although the long-term economic benefits of sustainable technologies, such as reduced regulatory and waste disposal costs, can be significant, businesses can be placed at a near-term competitive disadvantage because of potentially prohibitive, up-front costs. Regulations need to be revised to allow flexibility for the superior environmental performance obtained when clean technologies are employed.</p> <p>To effectively address this dilemma, ACS believes that governments should provide incentives for the implementation of sustainable technologies, as explained further by our answer to the green chemistry question.</p>
F-TD-2	<p>Industrial cleaning product constituent chemicals have a wide spectrum of potential effects on human health and the environment. Manufacturer employee, product user, and cleaned building resident exposures potentially encompass both acute and chronic health risks. Selected products and processes also manifest safety risks (e.g., fire, explosion, incompatibilities). Constituents may additionally pollute air, water and soil. Everyone gains when historic industrial and household cleaners are cost effectively replaced with “green” products and manufacturing processes that have passed quantitative, objective, and comprehensive assessments.</p> <p>Customization of the Chemical Compliance Systems, Inc. (CCS) “Green” Process Compliance Analytical System (G-PACS) and their “Green” Product Compliance Analytical System (GP-CAS) enables the Chlorine Free Products Association (CFPA) to utilize the “Green” Cleaning Product Process Analytical Compliance System (GCP-PACS) in conjunction with the third party accountability services of our Sustainable Manufacturing Initiative (SMI) on-site audits. Those facilities that complete the SMI with GCP-PACS are then offered access to the on-line, automated “Green” Cleaning Product Compliance Analytical System (GCP-CAS) to provide a complete, comprehensive, cleaning product assessment within 5-10 seconds. Both systems utilize over 40 ecological, health and safety criteria for each chemical constituent. The process, or product, is quantitatively rated on a scale of 0 (worst green) to 100 (best green) for easy manufacturing, or acquisition, assessment against pass/fail criteria, or comparison of competitor products. Compromising product hazards and offending constituents are also quantitatively identified. Both GCP-PACS and GCP-CAS include alternative constituent databases in their process/product Design modes that greatly streamline selection of less hazardous constituents to replace more harmful ingredients. This latter feature greatly facilitates “green” cleaning product and process research and development by rapidly calculating product, or process, “green” ratings as alternative constituents are theoretically inserted for compromising ingredients. Cleaning product or process constituent impacts on over 100 state, federal, international and other third party regulations are simultaneously assessed. GCP-CAS and GCP-PACS represent the first standardized, Web-based analytical compliance capabilities for quantitatively certifying the “greenness” of industrial cleaning products and processes by an independent third party. CFPA recommends that California consider these CCS capabilities as options for achieving the objectives of the California Green Chemistry Initiative.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-3	<p>Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input.</p> <p>We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes.</p> <p>California’s implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p> <p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p> <p>Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies.</p> <p>Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p> <p>Thank you for your attention to these important points.</p>
F-TD-4	<p>In reading the posts on this blog, I am troubled to see so much praise heaped on EPA's HPV program and am disappointed in the limited thinking that suggests that managing risks rather than managing chemicals is the way to a toxic free future.</p> <p>For nearly half a century, we have been managing risk yet somehow, toxic chemicals can be found in our land, in our air, in our water, in our bodies and even in our unborn children. It is time to acknowledge that the current system of managing risks does not protect the environment or public health and it is time to go in a new direction.</p> <p>Many companies want to do the right thing and want to make sure that their products are free from known environmental or biological toxicants but are frustrated because of the lack of data. In my conversations with these forward thinking businesses, the EPA's HPV Challenge program has done little to provide them with the information they are seeking regarding long term health and environmental impacts. HPV does not require any new information to be generated regarding a chemical's ability to cause cancer, reproductive harm, endocrine disruption, long term respiratory harm or neurotoxicity. Until we have a program that requires this information as a condition for being on the market, we will never know if a chemical that is used is truly the safest it can possibly be.</p> <p>In addition, any new chemicals policy needs to evaluate chemicals based on hazard, not based on how well we can manage risk. It is nearly impossible to know the life of a chemical. From its inception as a molecule, to its transport to manufacturing facilities to its use in the creation of a product to our store shelves to our homes or offices and finally to the landfill or ocean, it is a herculean effort to anticipate every scenario in which a toxic chemical may come in contact with our environment or ourselves. Since it is impossible to effectively manage risk at every stage of a chemical's life, it is a much easier and wiser strategy to not allow toxics to be used in the first place.</p> <p>I have been delighted to be a participant in this conversation with California and I sincerely hope that this conversation continues since 6 months is a very short amount of time to create a paradigm-shifting vision of our future together.</p> <p>In the mean time, I sincerely hope that the programs that come of of this initiative will be truly visionary. While information sharing with the EU and Canada is important, we must go beyond it and require information generation based on several different hazard traits, not merely those required under REACH or the Canadian program. This will take an investment and certainly time but we will not be sorry.</p> <p>Furthermore, as it has been said before, we should not be waiting to take action on those chemicals we know are harmful. As biomonitoring data shows us, our current strategy of managing risks has not prevented our being exposed to hundreds, if not thousands of chemicals.</p> <p>As someone who advocates for breast cancer survivors, those currently struggling with breast cancer and those who have lost their lives to this disease I will humbly submit that this is a moral issue. We cannot leave this problem to future generations nor can we assume that the market will take care of the</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	problem. Women are being exposed to breast carcinogens every day. I am encouraged that California has taken a leadership role in solving the chemical crisis and I am hopeful that the solutions this process generates will be thoughtful, bold and effective.
F-TD-5	We must stop adding toxic chemicals in our environment. One thing to do would be to develop and use cost efficient and time efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. This would help to eliminate a lot of toxic material in the environment.
F-TD-6	<p>To the extent the Viable List of Options includes options for a mechanism to ban or phase out the use of chemicals, please consider the following comments:</p> <ol style="list-style-type: none"> 1. The process established to consider the banning or phasing out of chemicals should be de-politicized to the maximum extent possible. One way to achieve that goal would be formation of a small panel of experts selected by the University of California president's office to make the determination whether the use of certain chemicals should be restricted. 2. It is important that the panel's work be viewed by all interested parties as impartial and scientifically beyond reproach. To ensure the perceived legitimacy of the panel's work, panel members should have the highest possible accreditation. To that end, panel members should be members of the National Academy of Sciences. Panel members should only be asked to serve short terms (2 to 3 years). 3. Panel members should be working in a relevant discipline (e.g., biochemistry, toxicology, epidemiology). 4. A limited number of substances should be considered each year. It may not be feasible to consider more than three to five substances per year, particularly given the other professional demands placed on highly qualified panel members. An incremental and deliberate process will also serve to minimize economic dislocations. 5. Petitions to phase out or otherwise restrict the use of chemical substances should be submitted to DTSC. Petitions that have been received should be posted on DTSC's web site and provided to the principal manufacturers and users of the chemical in question. Interested parties should have the opportunity to submit information to DTSC. Based on the information it receives, DTSC should select a small number of substances per year for the expert panel to evaluate. 6. The expert panel should be free to request any information it needs from any party and to conduct any investigation it deems appropriate. (No party should be compelled to respond, however). 7. The expert panel should have the authority to recommend the phase-out of a chemical from certain specific uses or to recommend that chemicals be banned from certain specific uses unless specified precautions are taken. There should be a strong presumption against banning a substance completely, as this can lead to the loss of manufacturing infrastructure and attendant economic dislocation. Phase-outs of chemical substances should be limited to those specific uses that have been demonstrated to be problematic. 8. In order to phase out a chemical substance from a specific use, there should be substantial evidence of harm caused by that use.
F-TD-7	<p>The Center for Biological Diversity ("the Center") appreciates the efforts being made by the state of California to address the issue of toxic chemicals. Toxic chemicals have become a pervasive part of our lives and action is necessary to protect public health and the environment from further degradation. The Center encourages California to lead the way as it has on other important environmental issues such as global warming—waiting for nationwide consensus will only result in further damage to the health of Californians and to California's environment.</p> <p>The Center for Biological Diversity advocates a precautionary approach to toxic chemicals. This means the burden of proof should be on the chemical producing companies to fully disclose the chemicals in their products and to adequately demonstrate that the chemicals and products are safe. A precautionary approach also means that California should not fail to act in the face of uncertainty—there is no reason for humans and the environment to suffer simply because of the lack of conclusive proof about the effects of various chemicals that have been found to be potentially harmful. In other words, if conclusive proof is required, such a burden should lay with the chemical producers to conclusively demonstrate that their chemicals and</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>products are safe. Chemical companies should also be required to fund independent research of the impacts of their products, not just research conducted by their own scientists. Moreover, the research should address the effects of multiple chemicals—only testing chemicals in isolation will fail to address the real world impacts.</p> <p>Furthermore, “safe” should not focus solely on human health. It is imperative that the precautionary approach be directed at the health of animals and plants as well. For instance, frogs, other amphibians, and fish are highly sensitive to chemicals in their environment. Many scientific studies have shown how chemicals are harming fish and amphibians, especially by disrupting their immune, endocrine, or reproductive systems. See, e.g., Rosen, Michael R. et al., Investigations of the Effects of Synthetic Chemicals on the Endocrine System of Common Carp in Lake Mead, Nevada and Arizona, U.S. Geological Survey, Fact Sheet 2006-3131, Version 1.1, October 2007, Prepared in cooperation with the U.S. Fish and Wildlife Service and National Park Service (found at http://pubs.usgs.gov/fs/2006/3131/); Hayes, Tyrone B., et al, Hermaphroditic, demasculinized frogs after exposure to the herbicide atrazine at low ecologically relevant doses, Proc. Natl. Acad. Sci. April a6, 2002, Vol. 99, Issue 8, 5476-5480 (found at www.pnas.org/cgi/reprint/99/8/5476.pdf); Endocrine Disrupting Chemicals: Summary of Research Activities within BRD (found at http://www.cerc.usgs.gov/Other_Webs/endocrine/summary.htm); Summary of Endocrine Disruption Research in Contaminant Biology Program (found at http://www.ecrc.usgs.gov/endocrine/summary.htm); Poisoning our imperiled wildlife: A Center for Biological Diversity Report, February 2006 (found at http://www.biologicaldiversity.org/swcbd/programs/science/pesticides/BayAreaPesticidesReport.pdf). In fact, heavy metals and PCBs are persistent in high quantities in fish, marine mammals, and seabirds, which can cause genetic damage as well as harm to immune systems. See, e.g., Toxicology of Marine Mammals, Edited by Joseph G. Vos et al.; David R. Thompson¹ & Keith C. Hamer; Stress in seabirds: causes, consequences and diagnostic value, Journal of Aquatic Ecosystem Stress and Recovery 7: 91–110, 2000. Again, in order to protect California’s biodiversity, the focus should be on only allowing the use of products that have been demonstrated to be harmless. Where uncertainty exists, caution should be exercised in favor of protecting wildlife and the environment—uncertainty should not be allowed to be used as an excuse for continued use of potentially unsafe chemicals and products.</p> <p>While impacts to all wildlife should be addressed, it makes sense to prioritize by focusing research on the impacts of chemicals to endangered, threatened, or imperiled species. By addressing the most vulnerable, we will likely be protecting many other species as well. It also makes sense to focus the most energy on amphibians and upper trophic level predators. Amphibians, due to their body type, are often the first animals to be impacted by toxics and can therefore likely provide us with early and important information about the harmful impacts of chemicals; upper trophic level predators (like polar bears) bioaccumulate toxins and therefore often exhibit high toxin concentrations in their systems, making them important sentinels of the ecological impacts of toxins. Research efforts should also include the monitoring of various species, especially amphibians and upper trophic level predators, so as to better understand what chemicals are already present in the environment and what their impacts are.</p> <p>In short, there is no sound reason to place the health of humans, or of other species, at grave risk, simply because we failed to adequately and carefully ensure that various chemicals were safe and would not accumulate in the environment. In addition to the adoption of regulations that better prevent harmful chemicals from being used in the first place, the Center advocates for the phasing out and ban of all chemicals found to be harmful to people or wildlife. A good example is the legislation recently passed by the state of California that outlaws the use of lead bullets in California condor habitat. This was necessary because the science showed that condors were being significantly harmed by lead. Similar legislation should be passed when confronted with situations where chemicals are harming people, wildlife, or the environment. Finally, incentives should be instituted that encourage the production and use of products that do not contain toxic chemicals as well as more aggressive education campaigns about the alternatives to harmful chemicals and their products.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-8	<p>November 16, 2007 Maureen Gorsen Director Department of Toxics Substances Control PO Box 806 Sacramento CA 95812-0806 Dear Ms. Gorsen-</p> <p>On behalf of my environmental organization Heal the Bay, and the public-private partnership of the Education and the Environment Initiative, I express strong support for the Green Chemistry Initiative. Clearly, the current structure by which we regulate chemicals in California is not sustainable. Given that California has serious pollution, ecosystem degradation, and natural resource scarcity concerns, it is imperative that the state develop a more cradle-to-cradle approach. The Department of Toxics Substances Control's (DTSC's) leadership is essential to create such a new policy and regulatory framework. Green Chemistry will better enable California to protect people, and the environment, as well as economically keep pace with changes worldwide, and here at home.</p> <p>Educate about the environment is fundamentally critical to any such new Green Chemistry policy and attendant programs. Education is necessary in order to scientifically inform such a policy, practically and efficiently implement it, and also to disseminate information about it to future generations. Luckily, California is currently poised to lead the nation in environmental literacy: the Education and the Environment Initiative (EEI) is a landmark environmental education law that requires the development and implementation of multi-disciplinary environmental education curricula in all disciplines (science, history/social science, English/language arts, and mathematics) for all K-12 grade students in state public schools. The EEI was co-authored by environmental organization Heal the Bay and signed into law in 2003 by former California Governor Gray Davis. In 2005, Governor Schwarzenegger allocated state funds over two years for environmental education curricula development under the EEI. A national model, the EEI will ultimately allow six million California school children each year to have the information they need to make informed decisions about protecting their health and our precious natural resources.</p> <p>As currently being developed, the EEI will necessarily include information that touches on green chemistry specifically. For example, EEI statutory mandates specifically call for the EEI curricula to address topic areas such as "toxics and hazardous waste," "public health and the environment," "pollution prevention," and "environmental sustainability." Obviously, there is significant overlap between the educational mandate of the EEI and the subject matter and goals of any state Green Chemistry Policy.</p> <p>We therefore encourage DTSC to make sure there is full integration between the EEI curricula development and its implementation, and the Green Chemistry policy and program development (including, but not, limited to K-12, post-secondary, and vocational educational efforts associated with Green Chemistry.) To date, DTSC has been very supportive of the EEI effort, and we gratefully applaud their leadership in this regard. We hope that as the Green Chemistry policy unfolds, that DTSC will continue to closely coordinate with the EEI and share Green Chemistry educational content, potential outreach opportunities, and other resources. Together, we can help children learn about environmental issues and make informed decisions about their individual impact on the environment.</p> <p>Sincerely, Leslie Tamminen Legislative Director/EEI Director Heal the Bay</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-9	<p>Thank you for soliciting input from California residents concerning the Green Chemistry Initiative. I am currently writing a book-length narrative about environmental illness (including one fictional character based on Dr. John Balmes, who was extremely helpful to me when I first became chemically sensitive), and I would love to contribute my insights to your project.</p> <p>The REACH program currently underway in the E. U. would be a wonderful model for California. In addition to this, however, we need to zero in on those toxins to which the general public is being heavily exposed on a daily basis. At the top of this list is secondhand cigarette smoke.</p> <p>Twenty-one years ago, Surgeon General C. Everett Koop concluded that secondhand smoke causes disease. Twenty years later, Surgeon General Richard Carmona called secondhand smoke an alarming public health threat, "a serious health hazard at any level" One and a half years ago, the State of California's Air Resources Board defined secondhand smoke as "toxic." So what are we waiting for?</p> <p>Who are we afraid of? ...more</p> <p>on behalf of Trudy Fisher</p>
F-TD-10	<p>The problems of toxics in products, both by design and by accident, need to be seen not just as a "design" issue – but as a knowledge generation issue. We still don't know enough about the risks to which we are exposed or why products are designed and produced in the ways they are.</p> <p>We need to invest much more in basic scientific, toxicological, and consumer testing and observations. The US EPA is supposed to be conducting comprehensive testing of chemicals for their endocrine disrupting potentials. After a decade, this program has yielded relatively few results and appears to be progressing slowly, in part because the US government has not set priorities with concomitant resources. A new institutional role for NGOs, communities, and citizens in California may need to be created, in order to make testing within the state, and ultimately nationwide, more publicly accountable and more responsive. This is already occurring for the biomonitoring program.</p> <p>We could change our regulatory science to accommodate a wider range of scientific and societal inputs. Many chemical risks are associated with multiple exposures (through using or being in proximity to multiple products), and with human behavior and buildings affecting actual use (for example, using personal care products in combinations or children ingesting substances while playing). Yet, regulatory science standards and procedures do not allow for these inputs. California could specify that its regulatory science processes for chemicals pay attention to the inputs. Already, the CARB has considered, and introduced standards for, a number of chemical products, including perc in dry cleaning and VOC emissions from paints more generally.</p> <p>We can improve our understanding of why and how industry uses chemicals, along with the uses and locations for these products. This analysis needs to be expanded to consumers and governments. In many cases, regulatory standards or established industry practices actually exacerbate the creation of risks. Flammability standards have encouraged the use of brominated flame retardants; companies often simply use specific chemicals in manufacturing because they are accustomed to doing so and their technologies and ordering systems are built on the chemicals. We need to conduct detailed studies of why specific chemistries are being used in terms of industrial structures and histories.</p> <p>In turn, we can develop a different set of metrics to evaluate the impacts of chemical products in much more easily visualizable ways. Instead of simply evaluating toxicity, we can create "maps" of where, why, how, and by whom chemicals are used in society and throughout cities. GIS data could be integrated with workplace use, health, ecological, and other data to identify patterns that affect chemical impacts. We need to understand, in particular, the distributional effects of chemical exposures.</p> <p>We also need to develop new monitoring systems that can track chemicals and materials as they are introduced into consumer products or industrial systems, and identify far more promptly emerging problems. The Royal Commission on Environmental Pollution in the UK recommended in 2003 that such systems be introduced. These could include developing biomonitoring schemes, consumer and ecological health surveillance, and feedback from workers and downstream users or manufacturers.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-11	<p>The California Association of RV Parks and Campgrounds (CalARVC) requests that the Department of Toxic Substance Control prohibit the import, sale, or use of certain RV toilet additives as part of the California Green Chemistry Initiative. Many of these products are detrimental to onsite septic systems and often cause systems to fail and pollute surrounding soil and groundwater. CalARVC, which is comprised mainly of hundreds of small "mom and pop" RV parks and campgrounds from all over the state, has been seeking a solution for this problem to several years. CalARVC believes the best solution is to ban the sale and use of deleterious products that contain formaldehyde or similar biocides. Most of the toilet additive products sold and used in California contain formaldehyde or a derivative of formaldehyde. These products help dissolve toilet paper and bio-solids and are used by RV owners to prevent odors and blockages in their toilet systems. However, the chemicals in these products that help dissolve toilet paper and bio-solids also kill natural biological organisms used in many onsite wastewater systems. Many onsite wastewater treatment systems use natural organism to breakdown bio-solids and toilet paper. Thus, when RV holding tanks containing certain RV toilet additives are dumped into an onsite wastewater system, which is a common everyday occurrence at RV parks, the chemicals designed to eliminate odors and dissolve toilet waste also kill off the natural organisms causing the onsite septic systems to fail....more</p> <p>on behalf of California Association of RV Parks and Campgrounds</p>
F-TD-12	<p>On behalf of Johnson & Johnson and its family of companies, I appreciate the opportunity to provide additional comments on the California Green Chemistry Initiative. Johnson & Johnson has identified a number of key policy points regarding green chemistry that we believe are important guidelines that will lead to the overall success of California's Green Chemistry Initiative. Johnson & Johnson recommends specific policy points should be structured around the following policy goals and objectives:</p> <p>on behalf of Johnson & Johnson</p>
F-TD-13	<p>Green Chemistry in California – Initial Policy Elements Proposed by the Silicon Valley Leadership Group (These comments have been posted to all four discussion forums in the same form, due to overlap in topics.) The Silicon Valley Leadership Group advocates a comprehensive, integrated approach to expanding Green Chemistry in California. By highlighting leaders in the corporate environmental practices and encouraging those who are further behind, we can all move ahead. We envision Green Chemistry as an interactive, evolving partnership with industry, government and consumers working together to protect human health and promote a cleaner, safer environment. Leadership Group members involved in crafting these initial suggestions include those from the electronics, biotechnology, pharmaceutical, chemical manufacturing, and supporting sectors. For more information about the Leadership Group please visit www.svlg.net. The Leadership Group proposes the following policy elements to further Green Chemistry in California:</p> <ol style="list-style-type: none"> 1. Strengthen the recognition and pursuit of Green Chemistry processes and products by establishing clear criteria and voluntary certification based on comprehensive lifecycle considerations. Equally important, consumers need to be educated about responsible choices and practices. 2. Explore models other than, or building upon, the current Materials Safety Data Sheet (MSDS) system to provide needed chemical hazard data throughout the supply chain. 3. Establish a Green Chemistry Coordination Council to collect and promote the sharing of information, highlight businesses with green practices, provide assistance to businesses lacking resources, and educate consumers. 4. Prioritize chemicals for screening, testing and appropriate restrictions. We suggest building upon the model of Canada's analysis and prioritization as

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>well as the Proposition 65 review process conducted by OEHHA. Chemicals of high concern should be allowed for targeted, low-exposure uses as determined in an open process by DTSC.</p> <p>5. Greater investment in pollution prevention in the short term as well as extension of the current CA Pollution Prevention model to downstream chemical users as an element of the long term Green Chemistry strategy.</p> <p>6. Continue the Conversation with California to sustain progress in Green Chemistry. The dialogue between DTSC and stakeholders has been very helpful and will result in more well-developed, effective policy.</p> <p>IN MORE DETAIL:</p> <p>1) Issue: Our market economy and the innovations that it engenders, environmental and otherwise, are driven by the relationship between industry and consumers. In order for industry to offer products that are environmentally-sound, and for consumers to recognize them, clear and stakeholder-driven criteria are necessary.</p> <p>Proposal: The Leadership Group proposes we strengthen the recognition and pursuit of Green Chemistry processes and products by establishing clear criteria and voluntary certification based on comprehensive lifecycle considerations. Equally important, consumers need to be educated about responsible choices and practices.</p> <p>While the focus of the Initiative has been on chemical safety, green chemistry in the broader sense should incorporate an accounting of embedded energy, CO2 impact, water usage, packaging, recyclability and so forth. Industry on the whole is already moving toward a greater consideration of these factors in our practices. The difficulty of quantifying and ascribing relative importance to these factors points to the need for commonly-held practices or industry standards.</p> <p>A voluntary certification program for green chemistry processes and products will clarify goals for industry members while empowering consumers with the information they need to make informed choices. As green chemistry practices evolve, according to the green chemistry principles we are so well aware of, so should the criteria - we should build flexibility into the system. It is important to note that a voluntary system is more pragmatic than standards at this point, given the innovative and often resource intensive approaches that will be required, the longer timeline necessary for industry transformation, and the need for consumers to have choices. As with organic food, not every consumer wants the environmentally-sensitive approach, if it costs more. The International Standards Organization (ISO) 14001 process certification and ACC's Responsible Care Management Practices are good examples to build upon.</p> <p>It is also important to note that potential green chemistry certification should be a recognition of process in addition to the product. As many experts in the DTSC Symposia have remarked, we are not only trying to improve products, but the entire system that goes into making that product. And we should realize that perfection will not be immediate, but evolve over time. In order to motivate voluntary certification some type of incentive, especially market mechanism such as rebate, tax incentive, or fee refund, should be explored.</p> <p>We understand very well that the consumer wants environmental accountability. As consumers gain in accountability, though, so should they gain in responsibility. This is in no way a proposal to allow industry to abdicate its responsibility for the safer use of chemicals, but rather to acknowledge that in a market-based society, corporate and consumer responsibility must closely intertwine to be successful. Beyond making informed purchases, we can best protect the environment when consumers understand Green Chemistry applies to them as well. How they collectively handle chemical products has an enormous effect (for example, nail polish remover can be easily poured down a household sink which would not be allowed in the workplace). The Green Chemistry Coordination Council described in the third point below could assist in consumer education.</p> <p>2) Issue: The MSDS provides insufficient data on chemical hazards to those downstream in the supply chain.</p> <p>Proposal: The Leadership Group proposes the DTSC explore models other than, or building upon, the current Materials Safety Data Sheet (MSDS) system to provide needed chemical hazard data throughout the supply chain.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Our members often find the data included on the Material Safety Data Sheet (MSDS) to be insufficient for determining chemical hazards. Many times important information is addressed in a superficial, boiler-plate fashion or missing altogether. The same raw material from different suppliers may have divergent information. This is in part due to some government regulations requiring that an MSDS be obtained directly from the manufacturer. While we recognize that confidential business information needs to be protected, best possible data on hazard and ecological effects should be made readily available to the supply chain and other stakeholders. In order to meet customer information requirements on chemicals in products, some electronics manufacturers currently must request additional information from upstream suppliers. Instead of doing this on a case by case basis, and in some cases taking the costly approach of reverse-engineering products to determine content, it would be more cost-effective to make raw materials hazard information available further upstream.</p> <p>One approach that could facilitate the sharing of information could be to use the existing MSDS system as a vehicle. More uniform information availability, through approaches such as the ANSI standard for a 16-section MSDS or the IPC 1752 could be an improvement. However, since the MSDS was originally intended to provide more immediate emergency response and use information, it might be best to explore other options such as an MSDS addendum, focused on hazard data. As both REACH and industry efforts such as the Global Product Stewardship initiative make available this data over a 4-10 year timeframe, it is important to recognize that generating this hazard data will take time.</p> <p>A voluntary certification process, with recognition for particularly thorough MSDS's, could also improve the quality of information while allowing chemicals manufacturers to differentiate their products. The Global Harmonization System for the Classification and Labeling of Chemicals (GHS) should be considered, as well. Any model chosen should include the appropriate ecological as well as toxicological information. We also recommend that early stage R&D chemicals be exempted due to their limited use and limited exposures.</p> <p>Worker exposure issues involving recognized hazards (mostly in small/medium enterprises) during the Conversation with California suggests that incorporating MSDS information into real-life practices may be an issue, aside from content. Technical Assistance for those less familiar with critical MSDS information is included as part of the Green Chemistry Coordination Council described below.</p> <p>3) Issue: Some companies and industries have already made much progress in achieving the aims of Green Chemistry while others lag behind. Green Chemistry involves myriad innovations and the collection and processing of much information. We do not have an adequate way of sharing Green Chemistry practices nor have we made the investment to encourage and reward green efforts.</p> <p>Proposal: The Leadership Group proposes the establishment of a Green Chemistry Coordination Council to collect and promote the sharing of information, highlight businesses with green practices, provide assistance to businesses lacking resources, and educate consumers.</p> <p>The information presented by the speakers, panelists, and stakeholders during the past year of effort on this Initiative has been incredibly thorough, enlightening, and inspiring for all stakeholders. We suggest the DTSC catalog and make easily available information regarding best practice screening processes, green chemical design, collaborative efforts such as the ACS Green Chemistry Institute, and international efforts such as the Global Harmonization System. All stakeholders still have a lot to learn in this dynamic area, and everyone stands to gain from continued information sharing. DTSC's leadership in this area should be continued by establishing it as a central clearinghouse of information for the state and beyond.</p> <p>Many medium and small companies are lacking in appropriate knowledge and resources, and will need assistance in taking advantage of Green Chemistry practices. Providing incentives for the sharing of data and best practices will help all companies. We further suggest building upon and making readily available the information provided by existing efforts: ACS Green Chemistry Institute, Cleangredients, U.S. EPA's Design for Environment Program, Performance Track, the chemical industry's HPV testing program, eChemPortal, EPEAT, and DTSC Technical Resource Center.</p> <p>4) Issue: California has limited resources to evaluate chemicals for restriction. Chemical safety is a measure of exposure as well as toxicity. While we need to carefully assess and restrict the use of chemicals of concern, complete bans fail to allow for appropriate and beneficial uses.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Proposal: The Leadership Group proposes the DTSC prioritize chemicals for screening, testing and appropriate restrictions. We suggest building upon the model of Canada's analysis and prioritization as well as the Proposition 65 review process conducted by OEHHA. Chemicals of high concern should be allowed for targeted, low-exposure uses as determined in an open process by DTSC.</p> <p>The DTSC, together with other relevant State agencies, needs to establish clear and consistent science-based protocols for screening and testing. These should include determination of endpoints of concern and modes of action, where scientific and methodological questions are sufficiently advanced to enable consistently sound science-based judgments of potential risk. The use of a transparent and rigorous process to evaluate risk factors as indicated by toxicological, epidemiological, and exposure data will allow us to compare the relative importance and safety of chemicals as well as determine whether any restrictions or substitutions are appropriate. A scientific panel of experts with a range of theoretical and applied chemicals experience can best establish and oversee a process acceptable to all stakeholders. The Proposition 65 review process may offer a starting point for development of a thorough, scientific process to meet these broader needs.</p> <p>Government entities around the world have been or are in the process of revamping their chemicals use policies. Although the DTSC will need to analyze the individual needs of our state through such means as chemical mapping, we should coordinate with the chemicals policies of other countries to minimize confusion, cost and competitive impacts. Starting with the thorough screening done by Canada's Environmental Policy Act (CEPA) would allow us to build upon their scientific knowledge base and mitigate the burden of data gathering.</p> <p>Any proposed restrictions or mandates should be targeted and include careful evaluation of alternatives. This targeted approach will allow us to concentrate our resources where most needed. Furthermore, any mandates should be harmonized with systems in other countries as much as possible. While we wish it were not necessary to use chemicals determined by such scientific protocols to be of high concern, many times they are needed to promote human health or advance ground-breaking research. This is the uncomfortable irony with which we will have to live until we find better alternatives. In the meantime, targeted use of these chemicals under highly controlled and low-exposure scenarios should be allowed by DTSC, after an open, scientifically based stakeholder process. In the absence of safer alternatives, which should be technically feasible, improve health/safety/environmental profile, be of comparable or superior performance, cost-effective, and be capable of persistence, banning should be avoided. In that case, resources should be devoted to R&D or incentives should be provided to develop cost-effective alternatives.</p> <p>Our goal should be a marketplace where informed decision making at both the manufacturing and consumer levels is consistently delivering changes/substitutions that advance our collective interests along the dimensions outlined above.</p> <p>We recommend that novel R&D chemicals, used in relatively tiny amounts in highly controlled settings, be excluded from any consideration of a restriction or mandate. There are rarely, if ever, exposures outside of the laboratory. Government oversight of these chemicals would not be cost-effective and would be counterproductive to the aims of Green Chemistry. Flexibility in this type of research chemical use promotes the innovation of safer chemicals and processes. Both CEPA and REACH exempt these chemical uses. Exemptions should also be allowed for select pilot demonstrations and testing.</p> <p>5) Issue: It will take a significant amount of time for industry and consumers to move to Greener Chemistry and we need to address pollution concerns in the meantime. Existing efforts at pollution prevention in the state utilize a collaborative model that has proven effective, but has been limited by its modest resource commitment and its narrow manufacturing focus.</p> <p>Proposal: The Leadership Group proposes greater investment in pollution prevention in the short term as well as extension of the current CA Pollution Prevention model to downstream chemical users as an element of the long term Green Chemistry strategy.</p> <p>Pollution prevention programs and policies such as SB 14 have been promoted for quite some time, yet they never receive anywhere near adequate funding and attention. We need to increase our investment in pollution prevention assistance, especially for medium and small businesses that either lack the resources or motivation to tackle the problem on their own. Since pollution prevention has led to demonstrated improvements and optimization of</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>chemical processes, it is a critical, complementary approach to Green Chemistry's goals of better chemical design. The model of collaboration between companies, the DTSC and third party experts (in the case of the SB 14 program, from the University of California), may also offer a model applicable to a broader Green Chemistry strategy. The impressive accomplishments of the Institute for Research and Technical Assistance in enabling development of substitutes for problem solvents in various applications suggest that such targeted 3rd party collaboration may pay dividends in products/product use as well as in manufacturing. This suggests the possibility of 1) taking chemicals of top priority concern, 2) identifying the specific applications or industry uses posing the greatest risk from those chemicals, and 3) applying a collaborative process of agency, industry and third-party experts to identify or develop viable alternatives that can maintain efficacy, but reduce risk in those targeted applications.</p> <p>6) Issue: The stakeholder process for developing Green Chemistry has provided much more comprehensive progress than could have been achieved otherwise. Proposal: The Leadership Group proposes we continue the Conversation with California to sustain Green Chemistry progress. The dialogue between DTSC and stakeholders has been very helpful and will result in more well-developed, effective policy. We commend the DTSC for encouraging creativity in finding safer alternatives and providing opportunities for open-ended discussion. There remains, though, a very real need for extensive further discussion by the stakeholders in this Green Chemistry Initiative. We hope that the inclusive nature of this process is not at an end. There are so many pieces to Green Chemistry and as the focus narrows to various subtopics, meaningful stakeholder participation will be essential. We have all built personal relationships and broadened our understanding of the various points of view. It would be a shame to toss this hard-won experience aside. Submitted: November 16, 2007</p>
	<p>The Western States Petroleum Association (WSPA) is pleased to offer the following comments on policy options being considered in the context of Cal-EPA's Green Chemistry Initiative. Many of the comments submitted to DTSC to date and debated in public forums refer to the need for California to supplement the requirements of the Federal Toxic Substances Control Act (TSCA). Prior to immediately moving in this direction, WSPA believes that DTSC must evaluate what regulations and information are currently available and whether these tools are being appropriately implemented and applied prior to developing new programs. Indeed, we expect this analysis is already underway, pursuant to the mandate to conduct a "baseline assessment" of existing programs and information described in the April 20 memorandum from Cal-EPA Secretary Linda Adams announcing the Green Chemistry Initiative. We further expect that this analysis will be presented to Initiative stakeholders for review and comment along with the policy options that flow from it, to ensure that all relevant information has been considered, including information obtained from national and international programs. We are optimistic that this approach will lead to meaningful improvements in existing state programs.</p>
F-TD-14	on behalf of Western States Petroleum Association
F-TD-15	<p>I am a resident of Ojai, California, and am concerned about the safety of many of the products we use from toxic chemicals in them - mostly food, but also pharmaceuticals, cleaners, etc. I have learned about the Green Chemistry Initiative which provides an opportunity to protect California by acting to restrict or eliminate especially dangerous substances and by mandating safer alternatives. This is a wonderful idea and I heartily endorse it. However, I really encourage you to ensure that in addition to incentive programs, the Initiative implements protective regulations, including restrictions and bans of chemicals for which the weight of evidence demonstrates a severe hazard to human health and/or the environment. Many thanks for considering this suggestion.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	on behalf of Walter M. McClelland
F-TD-16	<p>I am in support of the Green Chemistry Initiative to restrict or eliminate dangerous substances in California. We are being exposed to far too many chemicals in our daily environment and many of us are getting sick. It is especially necessary to get them out of commercial cleaning products that are used everywhere, from stores to doctor's offices and even hospitals! We need some strict regulation on use of harmful chemicals that in many cases can simply be replaced by less or non toxic ones. This is a critical situation which requires regulations to test chemicals and ban those shown to be a hazard to our health and well being.</p> <p>Please reply too: Diane Brodd</p>
	on behalf of Diane Brodd
F-TD-17	<p>I would like to add my support of the Green Chemistry Initiative to restrict or eliminate dangerous substances in California I would like to see this initiative include the problem of chemicals being used in our daily lives that have not been tested for neurotoxicity in children. I urge you to include restrictions and bans on chemicals that demonstrate a hazard to our health and/or environment.</p> <p>This is a critical situation that requires immediate attention by not only providing incentive programs but requiring restrictions and bans on those chemicals that are potentially dangerous.</p> <p>Please reply too: Linda Blackwell</p>
	on behalf of Linda Blackwell
F-TD-18	<p>Dear Director Gorsen:</p> <p>The Consumer Specialty Products Association (CSPA) has appreciated your continual efforts to include us in the discussions and stakeholder input on the Department of Toxic Substances Control (DTSC) California Green Chemistry Initiative. We also appreciate this opportunity to provide supplemental comments in addition to the information that we have provided on the "Conversation with California" website.</p> <p>CSPA is a national nonprofit trade association that represents more than 260 companies engaged in the formulation, manufacture, distribution and sale of consumer, institutional and commercial products. CSPA member companies manufacture and market a wide range of products, including: cleaning products, disinfectants and sanitizers, candles and air care products, household pesticide products, automotive products used to clean and maintain vehicles, and polishes and floor maintenance products.</p> <p>CSPA members are committed to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers. CSPA and our members support the broad goals of the Green Chemistry Initiative and look forward to working with DTSC and other stakeholders in the state to help spur green chemical innovation and ensure that products are safe.</p> <p>I. Background</p> <p>CSPA member products improve the quality of human life and are necessary to protect the public health against dangerous diseases, infestation, and unsanitary conditions. CSPA members are committed to providing products that are thoroughly evaluated for human and environmental safety and go through rigorous safety-based assessments before they are brought to market. CSPA members are also committed to clear and meaningful labeling on consumer products, i.e., label instructions are written to ensure that consumers use products in accordance with label instructions. Finally, CSPA</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>members are committed to the development of green products that are safe for human health and the environment. In addition, CSPA members routinely apply green chemistry and green engineering principles in their operations and have been honored with awards for their efforts.</p> <p>The consumer products industry develops products that meet or exceed safety requirements of all state and federal agencies in the United States and Canada charged with regulating those products, including the California Department of Pesticide Regulation, the California Air resources Board, and other state agencies, U.S. Consumer Product Safety Commission (CPSC), the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the U.S. Food and Drug Administration (FDA), Health Canada, and Environment Canada.</p> <p>While we support the California Green Chemistry Initiative and believe there is much that can be done to address and spur the development of green chemical technology, CSPA believes that regulation of our members' products under current federal and state regulatory authorities provides safety and protection to consumers. Below is a short summary of the various regulatory authorities that ensure the safety of consumer products and their ingredients. While it is not an exhaustive list of the regulatory requirements these products undergo, it illustrates the extensive oversight that already surrounds the manufacturing and marketing of consumer specialty products.</p> <p>II. Toxic Substances Control Act (TSCA)</p> <p>The Toxic Substances Control Act (TSCA) gives EPA the authority to regulate chemicals produced or imported into the United States. EPA repeatedly screens these chemicals and can require reporting, testing or a complete ban of those that may pose an environmental or human-health hazard. Any person intending to manufacture or import a chemical substance first must determine whether the substance is listed on the TSCA Inventory. If it is not listed, the prospective manufacturer or importer must satisfy premanufacturing notice (PMN) requirements before commencing production or importation of the substance. In filing a PMN, the manufacturer or importer must give their identity, specific chemical identity, product volume, use, exposures (worker, user and consumer), and environmental fate. Additionally, any test data relating to environmental or health effects of manufacturing, processing, distributing, using, or disposing of the new chemical substance must also be submitted.</p> <p>The PMN must be filed at least 90 days prior to the commencement of commercial production or importation of a new chemical substance. EPA's review of a PMN consists of seven major stages designed to ensure that EPA examines all aspects of a new chemical, including its physical and chemical properties, potential toxicity, exposure of workers, users and consumers, and economic benefits. EPA has the authority to prevent, delay, or limit manufacture after the initial PMN review period ends. EPA can issue an administrative order regulating a new chemical substance if the Agency finds that there is insufficient information to reasonably evaluate the risk and either the chemical may present an unreasonable risk to health or the environment or it will be produced in substantial quantities with the result that either substantial quantities will enter the environment or there will be substantial or significant human exposure to the substance. While EPA does not require a designated set of toxicity testing to be included in the PMN submissions, it has identified several categories of chemicals and the concerns areas where it has required such tests. Under these requirements a company must provide information addressing these risk concerns or face restrictions based on default assumptions.</p> <p>EPA has broad authority to regulate the existing chemicals in commerce as well. If a chemical presents unreasonable risks to health or the environment, EPA must initiate a rule-making to regulate the chemical. As of 2007, EPA has issued over 1300 Significant New Use Rules, which restrict the manufacture, import, or processing of a substance .</p> <p>EPA can prohibit or limit the manufacture, processing, distribution, commercial use or disposal of the chemical; prohibit or limit the use of the chemical in a concentration above a specified level; require adequate warnings and instructions with respect to the chemical's use, distribution in commerce or disposal; require record-keeping; prohibit or regulate disposal of the chemical; and require notification to the purchasers or the general public about the risks involved and to replace or repurchase a chemical substance or mixture if requested. EPA also has the authority under TSCA to require manufacturers of substances to develop safety and environmental data.</p> <p>III. Consumer Product Safety Act (CPSA)</p> <p>The Consumer Product Safety Act (CPSA) provides that when the Consumer Products Safety Commission (CPSC) finds an unreasonable risk of injury</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>associated with a consumer product it can develop a standard to reduce or eliminate the risk. The CPSA also provides the authority to ban a product if there is no feasible standard, and it gives CPSC authority to pursue recalls for products that present a substantial product hazard.</p> <p>The CPSC is authorized to set safety standards as to consumer product performance, composition, contents, design, construction, finish, packaging and labeling. In general, the manufacturer of a consumer product subject to regulation must issue a certificate announcing compliance with the applicable standards, and must label the product with the date and place of manufacture, the identity of the manufacturer, a certification of compliance with any applicable rule, and a brief description of such rule.</p> <p>Manufacturers are required to immediately notify the CPSC if it obtains information which reasonably supports the conclusion that a product: (1) fails to comply with a consumer product safety standard or banning regulation or a voluntary consumer product safety standard upon which the CPSC has relied upon; (2) contains a defect which could create a substantial product hazard described in the CPSA; or (3) creates an unreasonable risk of serious injury or death.</p> <p>In the last ten years, CPSC obtained 472 voluntary recalls involving 110 million product units. During this time, CPSC obtained 1031 corrective actions (including recalls and other actions to keep unsafe products from consumers).</p> <p>IV. Federal Hazardous Substances Act (FHSA) The Federal Hazardous Substances Act (FHSA) requires labeling of hazardous substances sold to households. It prohibits the sale or introduction into interstate commerce any product which does not comply with the regulations. FHSA regulations provide specific guidelines to determine potential risks specific to the entire formulation and package. Product risk assessments are the basis for label decisions and precautionary label text to protect consumers and children. At a minimum, labels must include hazard signal word, affirmative statement of hazards, the name of each component that contributes to the hazard, and precautionary measures to be taken to avoid risk, required or appropriate instruction for first aid treatment, handling instructions, storage instructions, and "Keep out of reach of children."</p> <p>V. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) provides the basis for regulation, sale, distribution and use of pesticides in the U.S. FIFRA authorizes EPA to review and register pesticides for the specified use which a registrant applies for. Before registering a new pesticide or new use for a registered pesticide, EPA must first ensure that the pesticide, when used according to label directions, can be used with a reasonable certainty of no harm to human health and without posing unreasonable risks to the environment. To make such determinations, EPA requires more than 100 different scientific studies and tests for active ingredients. In fact, EPA has banned and severely restricted 64 pesticides in the United States. When EPA registers a pesticide, it approves the product's label, which includes (among other things) directions for use, hazard warnings, and precautions. It is a violation of FIFRA for any person to use a pesticide in a manner inconsistent with its EPA-approved labeling.</p> <p>EPA also has the authority to suspend or cancel the registration of a pesticide if subsequent information shows that continued use would pose unreasonable risks to health or the environment. EPA may decide to remove a pesticide from the market based on information from a variety of sources: new studies conducted by the registrant, the Government, or a third party; incident information submitted by a registrant; or results of the EPA's periodic review of pesticides and tolerances.</p> <p>EPA is currently completing a review of those pesticides registered before November 1984 to ensure that they meet current scientific and regulatory standards. This process, called reregistration, considers the human health and ecological effects of pesticides and results in actions to reduce risks that are of concern. Concurrently, EPA has begun a registration review process for those products registered subsequent to 1984 and for those pesticides that were review under the reregistration process previously. These ongoing review processes assure the continual reexamination of the safety and environmental profile of pesticides.</p> <p>EPA and the states enforce FIFRA primarily through stop sale, use, and removal orders, civil penalties, or a combination of the two. Unlawful acts under</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>FIFRA include: selling an unregistered or misbranded pesticide; selling a pesticide whose composition differs from the one described in the pesticide's registration application, violating EPA's labeling requirements, failing to file annual production reports, and violating FIFRA's export requirements.</p> <p>VI. Recommendations for Product Stewardship & Safety-based Assessments</p> <p>As stated in our November 6 "Conversation with California" entry, CSPA supports company performed safety-based assessments of consumer products prior to the marketing of a product, that take into consideration all of the phases of a product's life-cycle. CSPA also supports appropriate use-restrictions for chemical ingredients when scientific safety-based assessments indicate that they cannot be used safely in a consumer product or use application. CSPA and our members believe that every responsible company should be performing these types of safety-based assessments and supports initiatives that recognize companies for these types of procedures.</p> <p>In fact, CSPA has demonstrated our industry's commitment to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers, when we initiated our Product Care program in 2001.</p> <p>CSPA's Product Care program is a stewardship program for the consumer and institutional specialty products industry where participating companies have agreed to go beyond government regulations in emphasizing health, safety and environmental concerns by carefully designing products, purchasing raw material and packaging, operating safe manufacturing facilities, promoting safe storage and distribution, providing useful product information, answering consumers questions and anticipating product disposal needs. CSPA believes that these types of product stewardship programs should be considered as frameworks for programs developed under the Green Chemistry Initiative.</p> <p>Product Care provides a framework for companies to identify and commit to stewardship principles, share ideas and information and benchmark better performance. Participating companies have pledged to develop management principles for each of seven areas in a product's life cycle from development in a research facility through product use and disposal. Through this program Companies Must Commit to Evaluate:</p> <ol style="list-style-type: none"> 1. Product Design 2. Raw Material, Package and Service Supply 3. Manufacture and Production Site Management 4. Product Storage and Distribution 5. In-market Support, Incident Evaluation and Follow-up 6. Consumer Education and Outreach 7. Product Disposal <p>Stewardship did not begin when CSPA's Product Care program was initiated in 2001. Responsible companies have long followed policies promoting safe products that provide important health benefits while not adversely affecting the environment.</p> <p>CSPA believes it is vital that these types of product stewardship programs and companies that participate in these programs be recognized and fostered through any program developed under the Green Chemistry Initiative. In particular, CSPA believes that DTSC and California can leverage and recognize programs like Product Care as a way of encouraging companies to establish robust procedures to ensure product safety and environmental safety.</p> <p>VII. Recommendations for Chemical Data Development Initiatives</p> <p>Chemical data development efforts should build on existing statutory and regulatory structures, voluntary initiatives, and data development efforts. CSPA does not support California-specific data development requirements and pre-market approval process for chemicals or consumer products. However, CSPA supports collaboration by DTSC and California in ongoing work by other government agencies to assess chemicals and consumer products. Specifically, California and DTSC could leverage efforts by Health and Environment Canada in addressing priority chemicals in the Chemicals Management Plan. DTSC and California could collaborate with these agencies on their high priority list and avoid needless duplication of current data development and prioritization efforts. DTSC and California could also participate in the effort launched in August during the Security and Prosperity Partnership (SPP) with under the Montebello Agreement involving trilateral cooperation among the governments of Canada, the United States and</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Mexico to share chemical information and safety assessments.</p> <p>In addition if DTSC and California move forward with efforts to establish chemical priorities the process should be collaborative and should include scientific experts in toxicity and exposure, chemical manufacturers, consumer product manufacturers, and nongovernmental organizations. CSPA believes inclusion of manufacturers of the chemicals and consumer products could provide toxicity and exposure/use data to determine whether the uses of “priority chemicals” are safe or should be restricted.</p> <p>As referenced above, CSPA does not support pre-market approval of chemicals or consumer products, because this would be an incredibly burdensome and expensive process for the State of California and would unnecessarily slow down the development of products. For example, the Department of Pesticide Regulation registers approximately 12,000 pesticide products sold in the State and in 2005-06 it cost the agency over \$17.5 million to review and approve these products . To require pre-market approval for the hundreds of thousands of chemicals and consumer products in commerce would be cost-prohibitive.</p> <p>VIII. Support for Appropriate Ingredient Disclosure</p> <p>Throughout Green Chemistry discussions and in recent market research consumers and others have expressed a desire to know what ingredients are in the products they use in their everyday life. These consumers are interested in having this knowledge in order to make informed product choices. It may appear that product ingredient information may not be readily available to consumers; however, our members willingly provide information to meet consumer needs. While some organizations have expressed concerns about ingredients in consumer products, much of this information is inaccurate. This is primarily due to the reliance on outdated resources that are dependant on old technologies or on assumptions made by sources that are not well versed in specific product chemistries.</p> <p>CSPA and our members support an appropriate approach to providing accurate information to consumers through ingredient communication. Our industry stands behind the safety of our products and the appropriate use of chemical ingredients in those products. We would like to work with DTSC and the State of California to implement a means of ingredient communication that would provide consumers with the information they can use to make informed decisions regarding the products they use in their homes.</p> <p>IX. Essential Principles for Green Chemistry Initiatives</p> <p>As any Green Chemistry program moves forward, CSPA believes, that in order for the effort to be credible and have a positive impact it must be structured in a way that includes all stakeholders and provides a sound scientific basis for the program. Specifically, Green Chemistry should ensure the safety of chemicals and consumer products through the use of sound science in the decision-making process.</p> <p>Additionally, green chemistry programs should be designed to ensure that products remain technologically and commercially feasible to produce; and that product efficacy, performance, and usability are not compromised or undermined. As such, Green Chemistry must foster innovation and not limit the development of new chemistry technologies.</p> <p>X. Support for Initiatives to Spur Green Innovation</p> <p>Stimulating green chemical innovation has been a core concept of the Green Chemistry Initiative, and discussion of this topic has shown the promise that new technologies have for improving the standard of life in California and reducing environmental impacts. CSPA supports collaborative efforts to encourage public and private partnerships with the goal of developing “greener” products and “environmentally responsible” ingredients rather than mandatory and voluntary state labeling programs that endorse green products or programs that stipulate a single third-party certification of green products.</p> <p>CSPA supports initiatives that provide incentives for companies that innovate and develop technologically and commercially feasible products using green chemistry. CSPA also supports recognition for companies that develop sustainable business operations, processes, and/or products. We also believe there are unique opportunities in California for research that identifies areas for the use of green chemistry in consumer products. Essential elements to ensuring that these technologies become widespread are implementing State policies that are designed to overcome barriers to commercial</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>application of green chemistry research and development efforts.</p> <p>XI. Conclusion</p> <p>Once again, CSPA has appreciated DTSC's efforts to include all stakeholders in the discussions during the California Green Chemistry Initiative. CSPA believes that the Green Chemistry Initiative holds incredible promise for helping spur green innovation in California. We also believe that the Initiative can leverage ongoing chemical data development initiatives in setting chemical priorities. Further, CSPA believes that DTSC should recognize and encourage the current product stewardship procedures and safety-based assessments that companies perform prior to marketing a consumer product. CSPA would also look forward to working with DTSC and the State of California on an appropriate ingredient information system to help inform consumers when making their purchasing decisions.</p> <p>CSPA looks forward to continuing to work with DTSC through the Green Chemistry Initiative, as recommendations are developed, and CSPA hopes that our continued participation in this discussion will provide meaningful help to the endeavor.</p> <p>Please feel free to contact me directly at (202) 833-7328, or CSPA's in-state representation, Laurie Nelson at (916) 446-1111 if you have any questions about these comments.</p> <p>Respectfully Submitted, Andrew R Hackman Manager, State Affairs Programs</p>
F-TD-19	<p>Every Californian should be interested in protecting the environment this should mean that public input should be required for any types of programs or processes. It is imperative we figure out the impact of the toxic chemicals in our environment and to od this developing and using human cell and tissue methods, computer-based methods like (Q)SAR and intelligent, tiered testing schemes. Green Chemistry goals should be implemented in CA and align with the vision for 21st Century Toxicity Testing recommended by the NAS report.</p> <p>Old-fashioned, animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. We cannot ensure the health and safety of CA's citizens or wildlife by relying on these methods.</p>
F-TD-20	<p>In order to design safer, less toxic products, we must have well-trained, knowledgeable scientists and engineers. Today, chemists, chemical engineers and most biologists receive absolutely NO toxicity training during their education. Students are usually familiar with unsafe compounds and how to work with them safely, but there is often little to no thought put into the safety of the end user when designing new products. This has been exacerbated in recent history as more and more companies become increasingly specialized and may have their starting material handled and processed by many other entities during the production process. An example in the news recently is that of phthalates in plastic children's toys. The chemist who designed the softer plastic using these chemicals probably didn't envision the wide array of products that would rapidly permeate our society. The original polymer mixture was then transferred through many levels of industry for processing, molding and final packaging before being brought to market. The engineer who designed the baby toys using these polymer mixtures probably had no idea there were phthalate monomers remaining in the plastic, much less the effects it might have if ingested. Neither of these characters is at direct fault--they are simply fulfilling the economic demand for materials with new properties and inexpensive products. In order to prevent toxic substances from making it into consumer homes, we need to look critically at the system that allows toxic chemicals to be used in consumer goods.</p> <p>This example highlights three issues that work together to cause the situation we have today: lack of testing, communication and reporting of potentially toxic compounds, lack of responsibility on the part of chemical producers and, I think most importantly, a lack of enforcement capabilities within our regulatory system. We rely on risk management policy which might sound like we "manage to avoid risk" but in actuality means we can't stop a chemical</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>from making it to market until people are PROVEN to have been harmed by that very specific compound. And even if the product is removed, similar chemicals that vary by only one or two atoms, but are likely to have the same physiological consequences can remain in circulation. With the vast amount of chemistry, biology, epidemiology and toxicity knowledge we have today, there should be a better way. The idea of synergy, where the sum toxicity of compounds mixed together is more than the toxicity of the components alone, becomes important to think about because of the enormous variety and combination of chemical-based compounds in our modern society. All these issues point to the need for a more holistic approach to chemical policy and regulation.</p> <p>By adopting Green Chemistry policies and initiatives, most of these issues can be addressed. Integrating toxicity training and the green chemistry principles at all levels of the educational process, and having real-time monitoring and innocuous degradation of starting materials will help prevent end-user exposure. These are main tenets of the 12 Principles of Green chemistry, which if adopted and promoted could vastly improve the safety of chemical-based products. In addition, we need to change our current, risk-based method of policy making, which limits the scope of chemical evaluation and puts people in harm's way before allowing the government to make chemical regulations. The only groups who benefit from "risk management" are chemical suppliers—they don't have to run toxicity tests or report their findings, they don't have to report quantities or end uses of potentially toxic substances, and they have no incentive to update manufacturing methods or reformulate, as that always comes with some monetary cost. They need markets and incentives to design better products, but won't comply without preventative regulation in place.</p> <p>Let's stop being reactionary and start being revolutionary. California is at the forefront of progressive policy and this is an extremely important issue that the European Union and many other countries have already begun to address. By adopting and practicing the green chemistry principles, in addition to a more preventative approach to policy making, we can demonstrate to the rest of the country that we can innovate and fulfill market demands while at the same time, protecting the health and safety of all living things.</p>
F-TD-21	<p>The following recommendations are submitted on behalf of the tens of thousands of California members of the Physicians Committee for Responsible Medicine and People for the Ethical Treatment of Animals. As California residents ourselves we appreciate the opportunity to contribute and look forward to continued involvement in California's Green Chemistry (GC) initiative.</p> <p>We are concerned that GC recommendations may include calls for large amounts of toxicity testing involving animals, and have prepared some comments and recommendations to address this concern. The timely and thorough evaluation of potential chemical hazards requires intelligent strategies for prioritization and evaluation, and we urge the California EPA to employ this approach when drafting its GC initiative recommendations. California cares about animals in laboratories</p> <p>Scientific experts representing animal protection groups such as PCRM and PETA work on a national and international level to push for the reduction and replacement of animals in laboratory testing, while ensuring the protection of the environment and human health. As awareness of the scientific and ethical problems with standard animal-based toxicity testing grows, our expertise is increasingly sought by the EPA and other federal agencies, the Organisation for Economic Co-operation and Development (OECD), the US's Interagency Coordinating Committee for the Validation of Alternative Methods (ICCVAM), the European Centre for the Validation of Alternative Methods (ECVAM), the European Commission, and within the chemical and toxicity testing industry. These organizations recognize that because we focus specifically on animal protection in context of regulatory assessment, our scientists are experienced at devising creative solutions that would circumvent the use of animals in laboratory testing. The contributing members of PCRM and PETA, nearly 75,000 of these living in California, entirely support efforts to reduce the use of animals in laboratories, as evidenced by the large number of posted recommendations generated by an e-mail to our California members,.</p> <p>Problems with animal-based toxicity tests</p> <p>One post on the Cal/EPA on-line Forum suggests that it is necessary to characterize the specificity and sensitivity of in silico and in vitro tests before their use and we are in agreement. A scientific evaluation of any new safety test is of course appropriate and necessary. However, one must also keep in</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>mind that the sensitivities and specificities of currently-employed animal-based toxicity tests have never been fully investigated or taken into account in any consequential way. While in vitro methods must be scientifically validated, there is no such requirement for in vivo tests to show reproducibility or relevance. For example, ECVAM estimated in a 2005 study that based on historical data for 171 rabbits that the rabbit pyrogen test had a sensitivity of 57.9% and a specificity of 88.3%. The 2-year rodent cancer bioassay is under increased scrutiny; a comprehensive review of all 502 the National Toxicology Program 2-year cancer bioassays conducted, and published reports, determined that results are reproducible only 57% of the time. An examination of teratology test data for 11 groups of known human teratogens across 12 animal species reveals a mean sensitivity of 61% . The developmental neurotoxicity test—a test that uses thousands of animals each time it is conducted—is a relatively new protocol currently in use that has still not been validated according to the principles of the OECD’s own Guidance Document on validation.</p> <p>These examples illustrate a concept that regulators and others have recognized for years but have failed to communicate or act upon: statistically, animal-based toxicity assessments do not predict outcomes in humans. It is only recently that regulatory authorities have begun to face this problem—California must not fall back onto reliance on these methods as it is aiming to lead us into the future in chemicals policy.</p> <p>Barriers to the use of non-animal methods</p> <p>A workshop convened in 2005 by the International Society of Regulatory Toxicology and Pharmacology (IS RTP) and attended by a broad base of scientists and policy experts from industry, regulatory agencies, and animal protection groups identified major barriers to the acceptance and use of non-animal toxicity testing methods to be institutional. Inadequate funding and resources, as well as “regulator comfort,” topped the list. This sentiment was echoed this year in a report by the Committee on Toxicity Testing and Assessment of Environmental Agents, convened by the National Academy of Sciences, at the request of the EPA, to draft a vision of the future of toxicity testing: “[C]urrent toxicity-testing practices are long established and deeply ingrained in some sectors. Thus, some resistance to the vision proposed by this committee is expected.”</p> <p>International consensus among scientists and policymakers regarding ICCVAM, the entity charged with validating and promoting non-animal toxicity tests, is that progress has not kept pace with technology. Inadequate funding and personnel, lack of a focused vision, and inadequate leadership has led to the dismal record of three validated methods in ten years, one of which only partially replaces an animal test and two of which still use live animals. This can be compared with ECVAM’s progress, with over 20 methods accepted and more than 150 undergoing development.</p> <p>In the event that Cal/EPA recommends or develops testing policies or procedures, guidance must include measures that insure the development and incorporation of relevant, reliable and predictive non-animal methods, and must not be limited to ICCVAM-validated methods.</p> <p>Lessons from other initiatives</p> <p>Throughout the GC initiative process, a number of chemical regulation programs have been reviewed in terms of how California should (and should not) proceed. These programs also have positive and negative characteristics from an animal protection standpoint. For example, a number of EPA scientists view work on prioritization and evaluation of new chemicals under TSCA, using QSAR and other tools they have developed, as a successful venture. The Canadian EPA can be applauded for its prioritization scheme. It took a realistic approach to chemicals information gathering and management by using simple tools to “bin” chemicals based on what it already knew and focusing on those of highest concern. For chemicals without any data, data from analogous chemicals, genetic toxicology, physicochemical properties, and QSAR tools were used to consider the chemicals’ priority ratings.</p> <p>Animal protection scientists had extensive involvement in the EPA’s High Production Volume Chemical Challenge Program (HPV), starting with a push for basic animal welfare considerations which were then transmitted to chemical producers and suppliers. We worked to suggest alternatives to proposed tests, often finding that manufacturers proposed duplicative tests due to incomplete data searches and missed opportunities for bridging data among similar chemicals. Additional animal testing was conducted when companies did not know about, or declined to apply, basic animal welfare principles. Other companies made stellar efforts to reduce animal testing by using the initial EPA strategies as well as strategies developed by animal protection scientists. These strategies were later used as a basis for further recommendations in the E-HPV program, a continuation of the original HPV program. Another, cautionary lesson of this program is that voluntary programs, while allowing for increased flexibility, make it difficult to enforce animal protection</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>measures.</p> <p>Although the European REACH legislation is held by some as a model for chemical evaluation programs, problems with implementation have yet to be discovered. Initial upper estimates regarding the number of animals killed while existing chemicals undergo the registration process neared 40 million. Fortunately, tireless lobbying by European animal protection groups and others has instituted policies that will reduce this number, such as in silico screening models, tiered testing, weight-of-evidence, category and read-across strategies, and the use of “scientifically appropriate” non-animal alternatives tests as they are developed and deemed so by ECVAM. The absence of appreciable exposures or production volumes can waive some toxicity testing in some cases. Additionally, the use of so-called “alternative” data, such as data generated under non-Good Laboratory Practice conditions and historical human data are allowed. These measures represent an important positive step in the incorporation of animal protection measures into the REACH chemicals program. However it remains to be seen whether these measures will be followed once the program is put into practice.</p> <p>In determining how chemical prioritization and evaluation will fit into the GC initiative, California must evaluate the positive and negative aspects of all past, existing, and future programs, and should determine how best to incorporate these aspects into its policies without duplicating them. All of these programs, as well as others not mentioned here, have generated toxicity data. It is of urgent and extreme importance that California negotiates access to this and other data, whether publicly available or not, to avoid duplicative testing. As experience has shown in the HPV program, chemicals companies cannot be relied upon to avoid duplicative testing. In many cases, it is easier and less expensive for them to simply check a box that requires animal testing than to comb through files of existing data or develop a thoughtful weight-of-evidence approach.</p> <p>Recommendations</p> <p>Based on the information above and to ensure appropriate chemical evaluation as part of a larger GC initiative, we make the following recommendations:</p> <p>Conduct a detailed, comprehensive assessment of existing laws, regulations§ and programs and ensure that recommendations for chemical screening, prioritization and evaluation include lessons learned from those programs. Cooperative agreements with existing programs are essential to avoid duplicative or ineffective efforts.</p> <p>Conduct a detailed, comprehensive assessment of existing chemical toxicity§ reporting and data availability programs and ensure access to those data as applicable to California. Assurances of some measure of formulation confidentiality would encourage producers and manufacturers to make toxicity and use data available.</p> <p>Information on chemical importation, use, and exposure patterns in§ California should be quantified and analyzed before requiring the generation of toxicity data; exposure and use data can and should be used to prioritize chemicals.</p> <p>A static, required list of toxicity tests should be avoided as§ check-the-box toxicology; instead, tiered, thoughtful testing strategies should be pursued with flexibility and creativity. For example, bioaccumulation, biopersistence, solubility, and other physicochemical parameters should be determined prior to conducting dose-related evaluations such as percutaneous absorption testing; moving up from there would involve a full characterization of the chemical or material using in vitro cell and tissue assays. For the sake of flexibility as science advances a list of required tests promulgated legislatively should be avoided.</p> <p>Ensure committees, meetings, and programs are publicly open at multiple§ stages. While the initial process for this initiative is public, and there were many opportunities for public comment and discussion, it is unfortunate that there will not be an opportunity for the public to react to the initial DTSC recommendations before they are transmitted to the Secretary for Environmental Protection for finalization.</p> <p>Seek input from animal protection stakeholders, who have a unique set of§ qualifications and can specifically address the reduction and replacement of in vivo animal tests, before recommending testing strategies or regulations.</p> <p>The National Academy of Science’s recent report addressing the future of§ toxicity testing should be embraced as part of a GC initiative, not only in the interest of animal welfare, but in the interest of a healthy environment. Issues of emerging concern, such as the toxicity of mixtures and synergistic</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>effects, nanotechnology, low-dose effects, and the timing of exposures in the life cycle, as well endocrine, immunological, and neurological effects, combined with the sheer number of existing and new chemicals, require a new way of evaluating chemicals. The vision of the NAS report, which calls for a reinvention of toxicity testing using high-throughput in vitro and in silico screens and tests based on human relevance, should be backed wholeheartedly by California. One tool that deserves special mention as a way to move this vision forward is the ToxCast program, in its first phase at EPA. The EPA is looking to enter into cooperative agreements with other entities in order to complete future phases. Additional information can be found on the Web: http://www.epa.gov/osp/ftta.htm. Funding, resources, ideas, and other contributions are necessary in order to help this vision come to fruition, and it is both within the capabilities of California and required by the vision of GC to do so.</p> <p>Other projects to promote more intelligent and/or human-based toxicity evaluation schemes are currently being pursued and should be incorporated into GC policy recommendations. These include: The OECD QSAR Toolbox and other International QSAR Foundation activities, OECD and NTP toxicogenomics initiatives, ILSI/HESI's Tiered Toxicology Testing Proposal for Pesticide Chemicals, the OECD Integrated Approaches to Testing and Assessment workshop (taking place in December of 2007), as well as others such as those presented during the Cal/EPA workshop October 1-2, 2007. We also encourage coordination with the FDA and pharmaceutical manufacturers.</p> <p>Despite the necessity of creating new human-relevant toxicity testing strategies, there are barriers to this goal as discussed above. As part of the GC initiative, California should put incentives into place for chemical manufacturers and testing laboratories to develop and validate human-relevant methods. These can include grant awards, tax incentives, or forms of product stewardship recognition.</p>
F-TD-22	<p>As a citizen of California who cares about the environment, scientific austerity, and animals in laboratories, CalEPA needs to focus on human-centered testing methods. Protecting the environment should be open and transparent with an opportunity for public input. The science used needs to focus on developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes.</p> <p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p> <p>Thank you for your time.</p>
F-TD-23	<p>During the course of the conversation with California, the High Production Volume (HPV) program has been the subject of discussion and criticism. The HPV program is a voluntary initiative that was launched as a cooperative effort among EPA, the chemical industry, and Environmental Defense in 1998. Through this effort, more than 300 companies and consortia volunteered to provide safety information on chemicals, which collectively represent nearly 95 percent of U.S. chemical production by volume. It has made more health and environmental data publicly available faster than any other regulatory or voluntary initiative before it. This significant contribution has been widely recognized as an important and successful program by EPA, state and foreign governments, public health officials and professional science organizations. By most measures, the HPV Program rates a solid A.</p> <p>Some have unfairly criticized the chemical industry and EPA's performance in this unprecedented program. However, more often than not, these criticisms are predicated on faulty analyses, and overly simplistic reviews of the program. For example, some critics want to look at raw numbers alone as a measure of the program's success or failure, without examining any underlying circumstances that might shed light on or explain the numbers more completely.</p> <p>ACC acknowledges that not all HPV Challenge submissions are complete and that the program did not meet its targeted end date, but industry commitments are strong and continue to be met. Sponsors have completed initial submissions for 97% of those chemicals sponsored in the U.S. Challenge component of the program. This includes submitting to EPA studies on more than 11,000 health endpoints.</p> <p>The HPV Challenge Program was unprecedented. Prior to the HPV program, no one had experience with an ambitious plan that sought to make a fairly significant amount of screening-level hazard information on some 2,200 chemicals publicly available in a relatively short 6- or 7-year period. Examples of</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>common problems encountered by sponsoring manufacturers that slowed work progress in the HPV Program are: insufficient technology for analytical method development; delays when preparing testing methodologies for substances that are difficult to test; guidance documents do not necessarily define all the requirements of a study, requiring sponsors to fine tune the guidance; and learning curves in the early stages of the program had to be overcome. In fact, manufacturers volunteering in the HPV program made commitments to use their best efforts to complete work by target deadlines. Comparing Speed of US HPV Submissions with Those Sponsored in the OECD Program Compares Apples to Oranges</p> <p>While it is true that a sponsor may fulfill a commitment either by submission to EPA in the U.S. component of the Challenge Program, or by submission to the OECD SIDS international program, comparing the completion rate between the two is not a fair one. In the OECD program, sponsors obtain a country sponsor to which a dossier and SIDS Initial Assessment Report (SIAR) are submitted for review and acceptance. Once the member country is in agreement with the content of the SIAR, the SIAR is then submitted to the OECD for review and comment by other member countries. Therefore, the sponsor country's review, comment, and agreement with the SIAR are imperative before a submission is deemed complete under the terms of the HPV Challenge Framework. This frequently involves a significant amount of discussion concerning data questions and data interpretation. In operational terms, this makes for a far lengthier process than is the case for those submissions to the U.S. EPA. Consequently, comparing the speed with which submissions are made in the two components of the Challenge Program results in a skewed interpretation of the submission rate.</p> <p>TSCA Is Strong and Robust</p> <p>Critics of the HPV program often maintain that the Toxic Substances Control Act (TSCA) is burdensome and blames it for the fact that EPA has not issued more test rules covering 243 HPV orphan chemicals, although these critics fail to offer any actual evidence to support this assertion. In fact, the requirements under TSCA are quite reasonable and not burdensome to meet. And, in point of fact, EPA plans to issue several section 4 test rules between the end of 2007 and 2009 on most, if not all, HPV orphan chemicals.</p> <p>Alternatives to Direct Testing Are Appropriate</p> <p>Some criticize the quality of HPV submissions based on their reliance on alternatives to direct testing, i.e., unpublished data; application of estimation methods; and category approaches. This criticism is unfounded. First, the fact that a study is not published does not mean that it is unreliable or less accurate than one that is published. Many scientific journals will not publish negative (finding that something did not happen)—studies having a bias for positive (something did happen) outcomes. The majority of the data and relevant studies were in company files and had not been published because TSCA does not require the submission of data that fails to show an adverse effect, and most companies generally were not inclined to share expensive test results with their competitors.</p> <p>Second, the use of estimation methods and category approaches was explicitly encouraged by EPA in the HPV Challenge Program. (See October 14, 1999, letter to HPV sponsors from EPA Deputy Assistant Administrator Susan Wayland). A quick review of the HPV guidance on EPA's and OECD's websites makes clear that these alternatives are appropriate when developing screening-level hazard information to complete the SIDS data sets, recognizing the significant animal welfare issues involved. Unfortunately, some choose to ignore the sensitive animal welfare issues presented in testing programs, which were a principal reason for the use of alternative approaches to testing under the HPV Program.</p> <p>All HPV Data Submitted Was Publicly Available, Readily Retrievable, and Usable From the Very Beginning of the Program</p> <p>Some critics claim that the HPV Program failed to have continuous, real-time access to program status and results on the Internet. However, every commitment, every robust summary, every test plan, every piece of data submitted was publicly available and readily accessible on EPA's website from the very beginning of the program's existence. http://www.epa.gov/hpv/</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-24	<p>Toxics by design The chemical industry is responsible to putting chemicals on the market, & providing the society with all the benefits the chemicals bring. However, that also brings the responsibility to analyse the human health & environmental profile of the chemicals, and manage chemicals in an appropriate way in accordance with their profile. REACH is a good example of such responsibility. Risk assessments as described under RACH & the current Existing Substances Regulation of the European Commission do provide detailed evaluations of the chemical properties and risks they pose to health and environment, and quality data according to GLP & approved protocols should lay at the basis of such assessments. Such a system should give clear certainty to industry that a chemical can continued to be used once the assessment is completed and approved, & it should also not continuously be challenged on the basis of data which are not scientifically sound.</p> <p>Having said that, the concept is to drive improvement where possible, even if a substance is being accepted through the system. Even where acceptable risk levels are identified, continued risk reduction should be encouraged and rewarded, as well as development of products with improved characteristics. Product stewardship programs, designed to better management throughout the supply chain of the substance, & continued minimisation of the impact of the substance, should be recognised & encouraged.</p>
F-TD-25	<p>The below listed organizations appreciate the opportunity to provide comments on the California Environmental Protection Agency's (CalEPA) Green Chemistry Initiative. Our organizations represent many of California's and the nation's leading industries and employers. We fully support science and risk based chemicals management policies which protect health and the environment while assuring product safety and efficacy and promoting innovation in the marketplace in California.</p> <p>Chemistry is at the foundation of a wide range of industries. The science of chemistry helps to make the lives of Californians and others throughout the world safer, healthier, and more productive. Chemistry goes into modern materials used to make insulation, weatherization equipment, firefighting and other emergency response equipment, lightweight vehicle parts, coatings, lubricants, and energy-efficient appliances. Just a few of the many industries that use chemical or chemical-derived products include farming, new residential construction, emergency response services, plastic bottle manufacturing, electronics and high-technology, consumer products manufacturing, upholstered furniture manufacturing, dry cleaning services, building services and health care.</p> <p>We support the statement of CalEPA Secretary Linda Adams that this "...strategy, and the policy it champions, must have at its core and be governed by sound science." Advancements in science make possible product innovations that meet consumer needs, while increasing knowledge about the safety of chemical products and protecting the environment. A science-based assessment that evaluates human health and environmental considerations, performance, and cost and feasibility must include an examination of traditional and alternative technologies, materials and processes. Incentive-based approaches can allow companies to more easily and effectively share this knowledge, best management practices, and opportunities.</p> <p>Our industries and employees appreciate California's leadership in undertaking a comprehensive, scientific and risk based approach to this complex issue.</p> <p>Adhesive and Sealant Council American Chemistry Council AeA (American Electronics Association) American Sportfishing Association Association of Woodworking and Furnishings Suppliers California Chamber of Commerce California Circuits Association</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>California Manufacturers and Technology Association California Paint Council Chemical Industry Council of California Consumer Specialty Products Association Flavor and Extract Manufacturers Association Fragrance Materials Association Grocery Manufacturers Association Independent Lubricant Manufacturers Association International Association of Color Manufacturers International Sleep Products Association IPC – The Association Connecting Electronics Industries National Association of Home Builders National Paint and Coatings Association NFIB – California Soap and Detergent Association Society of American Florists U.S. Chamber of Commerce</p>
F-TD-26	<p>DTSC should look at the procurement and / or contractual use of existing data and software tools to implement the Green Chemistry Initiatives for the short-term and long-term program needs. Previous posts have indicated various available existing chemical data systems and tools, including Chemical Compliance Systems, the Canadian efforts, and the European REACH program. Use of these types of tools could facilitate implementation of voluntary and/or regulatory programs in the near future as a beginning effort and establishment of a foundation, to be built upon in future developments, meeting the Green Chemistry initiative goals and objectives. One example of a potential use of existing tools is the establishment of a product “green” certification program which would allow consumers to readily identify green products. This type of program is already available via use of Chemical Compliance Systems data tools that can provide an automated “Green” assessment of chemical products which can be readily tailored for use in California. The use of such existing programs can provide efficiency through the avoidance of “re-inventing the wheel” and expanding on proven technologies and / or approaches.</p> <p>Through the procurement and / or contractual use of existing data and software tools, DTSC should establish programs and/or partnerships by which these types of tools and data can be made available to other stakeholders (such as product manufactures, business and private consumers, other government agencies, etc.) on a free or lower-cost basis for the purpose of meeting or promoting the Green Chemistry Initiative goals and objectives.</p>
F-TD-27	<p>Toxics by Design</p> <p>The chemical industry or chemical importers should take the responsibility to describe the environmental characteristics of their products. The financial burden of testing chemical products appropriately lies with the producer or importer. Such testing should be carried out at independent test facilities, and it may be beneficial to California to encourage the creation of such test centers within the state – either as independent entities or as part of the CA University system. Self certification by the producer would be based on independently run tests of a chemical’s characteristics in terms of whether the chemical should be considered persistent, bio-accumulative, and toxic (PBT), or should be considered a very persistent and very bio-accumulative (vPvB), or should be considered to have significant possibility of being carcinogenic, mutagenic, or reprotoxic (CMR category 2). These classifications are well recognized in global regulatory systems, and the data necessary for such classifications can be clearly defined. The data and rationale behind</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>the assessment shall accompany the submission. The submission would be reviewed by the CA EPA and final determination of the chemical's classification will lie with CA EPA. At the discretion of CA EPA, appropriate stakeholder involvement in this process can be encouraged. Materials classified as PBT, vPvB, or CMR category 2 should be subject to risk analysis. This is a primary focus for any policy – to address materials having clear areas of concern. If risk levels are judged too high, then industry should have the opportunity to introduce appropriate measures to reduce risk within a given time span, or face phase out of the material. Again the concept is to drive improvement where possible. Within a phase out strategy, the potential use of alternatives must address any risks associated with such substitution. It should not be acceptable to propose substitution by a material for which there is little data on its characteristics. Fundamentally, lack of data should not be rewarded. Even when there are acceptable risk levels, continued risk reduction should be encouraged and rewarded. Incentives could be given to develop products with improved characteristics, e.g. non-PBT or polymeric chemical additives. Similarly, improved stewardship, such as driven by the BFR industry's Voluntary Emission Control Action Program (VECAP) should be encouraged and rewarded. Materials not classified as above, should be approved for use, unless there is a clear concern identified. Ideally all materials should be subject to risk analysis, but this may not be practicable.</p>
F-TD-28	<p>The Grocery Manufacturers Association (GMA) represents the world's leading food, beverage and consumer products companies. The association promotes sound public policy, champions initiatives that increase productivity and growth and helps to protect the safety and security of consumer packaged goods through scientific excellence. The GMA board of directors is comprised of chief executive officers from the Association's member companies. The \$2.1 trillion consumer packaged goods industry employs 14 million workers and contributes over \$1 trillion in added value to the nation's economy.</p> <p>GMA appreciates the opportunity to participate in a dialogue on California's Green Chemistry Initiative with California's Environmental Protection Agency (CalEPA) and other interested parties. Our membership includes leading consumer products companies that produce safe consumer products that are protective of human health and the environment while improving the quality of life and protecting the public health against dangerous diseases, infestation, and unsanitary conditions.</p> <p>Green chemistry is sustainable innovation. It is built upon a foundation of companies using hazard and exposure analysis to address safety prior to marketing. It is about moving toward products with improved environmental quality that also improve performance and consumer value to better meet all consumer needs. It uses analytic tools such as life cycle assessment to guide real product improvement and to protect against burden shifting or regrettable substitution with unintended adverse consequences, such as occurred with MTBE.</p> <p>Background</p> <p>Our members are committed to thoroughly evaluating their products for human and environmental safety through rigorous safety-based assessments before they are marketed. Our members provide clear and meaningful labeling on consumer products to ensure that consumers use products in accordance with label instructions. Our members routinely apply green chemistry and green engineering principles in their operations and have been honored with awards for their efforts. The consumer products industry develops products that meet or exceed the safety requirements of all state and federal agencies in the United States and Canada charged with regulating those products, including the California Department of Pesticide Regulation, the California Air Resources Board, other state agencies, the U.S. Consumer Product Safety Commission, the U.S. Environmental Protection Agency, the U.S. Occupational Safety and Health Administration, the U.S. Food and Drug Administration, Health Canada, and Environment Canada.</p> <p>GMA supports initiatives that continue to foster innovation and encourage universities, educational institutions, and industry to partner in developing effective "greener" ingredients that reduce environmental impact. We support company performed safety-based assessments of consumer products prior to the marketing of a product, considering all phases of the lifecycle of a product. Any chemicals management program must be based on sound scientific risk assessment to protect public health and the environment, and we support appropriate use-restrictions for chemical ingredients when those</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>scientific safety-based assessments indicate they cannot be used safely in consumer product or use application. We support initiatives by companies, government and interested parties to promote consumer awareness of the importance of reading and following label instructions for safe product use, storage and disposal.</p> <p>We applaud collaborative efforts to encourage public and private partnerships, with a goal of developing greener products and environmentally responsible ingredients based on life cycle considerations, rather than mandatory and voluntary state labeling programs that endorse green products or programs that stipulate a single third-party certification of green products or numerical ranking. We encourage research that shows opportunities for the use of green chemistry in consumer products, as well as policies designed to overcome barriers to commercial application of green chemistry research and development efforts. We support initiatives that create incentives for innovative companies that develop greener products that are technologically and commercially feasible, and we encourage recognition for companies that develop sustainable business operations, processes and/or products.</p> <p>General Principles</p> <p>We believe that the Green Chemistry Initiative should ensure the safety of consumer products through the use of sound science in the decision-making process. It must foster innovation and encourage the development of new chemistry technologies. The Initiative should be designed to promote products that are technologically and commercially feasible to produce without compromising product efficacy, performance and usability. It should build on existing statutory and regulatory structures, voluntary initiatives and data development efforts. Finally, CalEPA should seek guidance from all stakeholder interests.</p> <p>Key Elements for the Green Chemistry Initiative</p> <p>We respectfully submit that the framework for the Green Chemistry Initiative should include the following elements:</p> <p>(1) A Systematic, Collaborative Process to Address Priority Chemicals:</p> <p>We support California's initiative to move beyond a chemical-by-chemical approach and build a more systematic, scientific and collaborative process to address priority chemicals. As Governor Schwarzenegger recently stated:</p> <p>"I strongly believe there needs to be a systematic way to address these types of concerns where California's scientists can work together with experts throughout the world to evaluate the health effects of chemicals, assess the risks they pose, and ensure that the safety of possible alternatives receives the same consideration."</p> <p>It is eminently sensible for California's collaborative effort to proceed in tandem with ongoing work by other government agencies assessing chemicals. The Canadian Government announced their Chemicals Management Plan on December 9, 2006. Numerous substances that have been in commerce for more than 20 years were assessed against rigorous scientific criteria. As a result of that process, Health and Environment Canada are now addressing priority chemicals as part of the Industry Challenge Program within the Chemicals Management Plan. Since Canada is undertaking this proactive approach for existing substances against the most modern science, we respectfully suggest that CalEPA collaborate with the Canadian government not only on the priority list of chemicals but the program in general. In our opinion, this collaboration would avoid needless duplication, inefficiencies and burdens, as well as take advantage of credible, high-quality scientific work already completed. This will help the government of California to meet its goals in a faster, more cost-effective way.</p> <p>Working with the Canadians and the Plan undoubtedly would foster greater results for the regulatory cooperation agreement for chemicals announced by the President and the leaders of Canada and Mexico this past summer. As part of the agreement signed in Montebello, the three countries agreed to share data, information and safety assessments so that all North Americans would have continued access to safe and effective products with improved sustainability and environmental quality profiles. With California's expertise at the table, collaborating with the agencies involved could accelerate the benefits of this effort across the North American region.</p> <p>As indicated in Governor Schwarzenegger's comment, it is important that California proceed with a science-based approach that focuses on key</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>information, including toxicity and exposure of chemicals and possible alternatives, so that sound safety decisions can be made in the context of scientific risk assessment. This process must be the tool for focusing resources and attention on a limited number of chemicals that are important to evaluate. The process should be collaborative and should include scientific experts in toxicity and exposure from academia, chemical manufacturers, product formulators, and nongovernmental organizations. The manufacturers of the chemicals and consumer products could provide toxicity and exposure/use data to determine whether the uses of "priority chemicals" are safe or should be restricted.</p> <p>(2) Ingredient Communication: Some consumers have expressed a desire to know what ingredients are in the products they use in their everyday life. These consumers are interested in having this knowledge in order to make informed product choices. We support providing accurate information to consumers through ingredient communication. Manufacturers of essentially every name-brand product have programs to respond to the information requests and needs of consumers. For example, we actively work with consumers who call our toll-free numbers or send emails. We are always looking for better ways to communicate. Some third party assessments and information available on the Internet or through literature searches can be inaccurate due to the reliance on sources or on assumptions that may not be as current as the information provided by the manufacturers or industry groups representing the products. Industry has the obligation and continues to improve the methods it uses to communicate product information to consumers, especially in its efforts to ensure the safe and appropriate use of the products. We would like to work with California to implement a means of ingredient communication that would provide consumers with the information they can use to make even better informed decisions regarding the products they use in their homes.</p> <p>(3) Product Safety Assessments: Our members are committed to thoroughly evaluating their products for human and environmental safety through rigorous safety-based assessments before they are marketed. We support the continual improvement of safety assessments and methodologies including conducting life cycle assessments to help understand the health and environmental footprint of products and possible alternatives through their lifecycle. Our members have staff that includes experts in toxicology and environmental science to work on these assessments. CalEPA could work with scientific experts to examine best practices and to develop a toolkit for safety assessment programs and for safety assessments. Companies also could make a description of their safety assessment process available on the Internet. This could help provide context for product ingredient communication. In addition to product safety assessments, companies could adopt programs to ensure the safety of raw materials and packaging, operations, storage and distribution, and the use and disposal of products.</p> <p>(4) Supporting Innovation: The Green Chemistry report argues that there is a need to close the "technology gap" through market-based incentives to support green chemistry. This could include funding for university research grants, scholarships, and similar programs, as well as awards for innovation, tax credits, low-interest loans, and other incentives. These positive incentives should be open to all companies that are innovators and sell products in California -- not simply be limited to companies located in California. * * * * *</p> <p>Chemicals are useful and essential ingredients for many products that protect public health and improve the quality of our lives. We appreciate the importance of a scientific approach based on an evaluation of hazard and exposure information to determine the safety of these products that improve the well-being of the public.</p>
F-TD-29	<p>Here's a novel idea: how about we start using natural substances that are not toxic in the first place and end this absurd and relentless abuse of animals in toxicity testing that we all know is both inhumane and inaccurate. We will never progress in any area until we stop the needless suffering of all species</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	on this planet.
F-TD-30	<p>There are certainly ways to help our environment without hurting any of the animals in our environment! There are ways to identify and eliminate toxic materials without hurting any animals!!! Please work to prevent any tests on animals for any reason. Tests on animals, in any form, are, in my opinion, inhumane and unjust. Thank you for your consideration. Nora Hull</p>
F-TD-31	<p>As a resident of California for over 35 years, I am deeply in favor of protecting our environment. However, CalEPA's consideration of large-scale toxicity testing could result in the deaths of thousands of innocent animals. Instead of employing animal testing, there are other less cruel and more effective alternatives, such as using human cell and tissue methods or computer based methods. As an environmentalist and animal rights advocate, I respectfully urge the EPA to consider using non-animal based testing to achieve its green chemistry goals.</p>
F-TD-32	<p>A recent report by the National Academy of Sciences, entitled "Toxicity Testing in the Twenty-First Century: A Vision and a Strategy," recommends an overhaul in the way chemicals are tested for toxicity. California's implementation of green chemistry goals should be consistent with this vision, and the state should commit resources to this effort. Animal-based toxicity testing methods are dismally inaccurate, and they result in the painful deaths of hundreds or thousands of animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these outdated testing methods. Thousands of chemicals have already been tested in other government programs, and existing data must be gathered, fully evaluated, and used prior to initiating further testing requirements. Only human-focused testing methods such as cell and tissue assays should be used</p>
F-TD-33	<p>At Bayer MaterialScience we share society's values of developing, producing and putting into the marketplace products that are both beneficial and safe for humans and the environment. We respect and support the objectives of Responsible Care® along with sustainable development as a commitment for management and as a responsibility shared by each employee. We at Bayer continue to address green chemistry objectives through innovation and product stewardship. Innovation is essential to driving green chemistry and sustainability in markets such as automotive, green building and alternative energy. Products and their uses are evaluated to help assure intended benefits to society while also protecting public health and the environment. We follow the American Chemistry Council's Responsible Care® program, with a management system that is certified by third-party auditors. We integrate knowledge of potential hazards of chemicals with an understanding of potential use and exposure in our risk management programs. We appreciate the California Green Chemistry Initiative's request for comments on the program and support an approach that addresses the following points:</p> <ul style="list-style-type: none"> • Look at the chemical information that is already available to California. • Make it clear that the Green Chemistry Initiative process will be governed by a risk-based science approach. • Support an understanding of both the benefits and the burdens of new regulatory proposals. • Consider process technology as part of a green chemistry program. <p>Look at the chemical information that is already available to California: We believe that California should consider existing data and information already available to California and the public before making judgments on additional chemical specific data and information needs. There are existing programs such as the High Production Volume (HPV) Challenge Program</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>and the Extended HPV Program, which have provided valuable toxicology and exposure information that is publicly available. Hazard information from such sources can be used in light of exposure scenarios to evaluate potential risk and ensure appropriate risk management. In addition, the information from the recent evaluation and categorization of chemicals on the Canadian Domestic Substance List (DSL), Canada, should be considered by California.</p> <p>Make it clear that the Green Chemistry Initiative process will be governed by science with a risk-based approach: We believe that the Green Chemistry Initiative must be based on sound science with a risk-based and weight-of-evidence based approach. Objective and reproducible scientific methodologies are the keystones upon which regulatory policy should be based. Everything can be toxic at some level; the key is to minimize potential risks (risk = hazard x exposure). The Green Chemistry Initiative should be based on the principles of risk. That is, minimizing the use of toxics in light of the exposure scenarios, along with considerations of efficiency and economics.</p> <p>Support an understanding of both the burdens and the benefits of new regulatory proposals: To most efficiently use resources, we believe that consideration should be given to existing chemical management systems. Many existing regulatory and voluntary programs promote innovation and advances in chemical technology, govern areas of product life-cycle, and also promote pollution prevention and research into the use of less hazardous substances.</p> <p>We believe that the Toxic Substance Control Act (TSCA) is a comprehensive chemical management statute. Criticisms of the TSCA to protect human health and the environment often overlook the real need for resources to properly administer the statute. Without the proper staffing and financial resources, any regulatory program will have limited effectiveness.</p> <p>Innovation is critical to green chemistry. Rather than imposing regulatory burdens, innovation through green chemistry can be promoted with positive incentives and partnerships. Green Chemistry should be encouraged through the sharing of expertise, financial support for research, information exchange, and public education. Incentives could be offered for companies to pursue and foster Green Chemistry and Green Engineering.</p> <p>Consider process technology as part of a green chemistry program: Green chemistry is an important consideration in efforts that lead to sustainable development, but it is only part of a potential solution. In a broader sense, green chemistry programs should include process technology considerations as alternative chemistry is being evaluated. This technology can have a significant impact on minimizing potential adverse health or environmental effects of a chemical substance. Process technology can reduce both human and environmental exposures to chemicals, for example, through enclosed systems, recycling of by-products, and controlling potential environmental releases. Use of these process technologies can eliminate the need for substitution of critical raw materials.</p> <p>In conclusion, we believe that a green chemistry initiative must be based on sound science, be risk-based, leverage validated existing health and environmental information, and consider engineering and processing technology. We feel that innovation and partnership with industry should be encouraged. Industry should be brought in as a critical stakeholder in this Initiative as it develops.</p> <p>On behalf of Bayer MaterialScience LLC</p>
F-TD-34	<p>Give me a break! Going Green does not mean testing on poor defenseless animals! Testing is an outdated and barbaric practice in any society! This is outrageous!! Please do not do this!!</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-35	<p>Our industry creates products and services that make life better for people around the world — both today and for tomorrow. The benefits of our industry are accompanied by enduring commitments to Responsible Care in the management of chemicals worldwide. Several of the Responsible Care® Guiding Principles require/encourage manufacturers to be responsible for concerns regarding their products and communicate these to the public.</p> <ul style="list-style-type: none"> To provide chemicals that can be manufactured, transported, used and§ disposed of safely. To provide information on health or environmental§ risks and pursue protective measures for employees, the public and other key stakeholders. To support education and research on the health, safety and§ environmental effects of our products and processes. To work with others§ to resolve problems associated with past handling and disposal practices. <p>We would encourage DTSC to rely on the work that will be developed as a result of the Montebello Agreement between the United States, Canada and Mexico. The environmental agencies of the three companies will coordinate efforts to advance chemical assessment and management in North America.</p>
F-TD-36	<p>Procter & Gamble Suggestions</p> <p>The California Green Chemistry Initiative holds a lot of promise for expanding the principles of Green Chemistry, accelerating innovation and creating important health, environmental, social and economic benefits. Through the Conversation with California—workshops, symposia and Blog contributions—it’s clear that there is broad interest and excitement about moving the state forward, both in improving protections for the environment and the health of Californians, and in creating a more sustainable future. P&G supports the State’s objectives. Here are some ideas that California can consider to advance GCI.</p> <p>Priority Chemicals—California should establish a program to identify, assess and manage priority chemicals based on an evaluation of hazard and potential for exposure</p> <ul style="list-style-type: none"> - Move quickly by leveraging priorities identified in the Canadian Chemical Management Plan. Create a collaborative effort between California and Canada to accelerate progress in both geographies. - Include a means for adding and deleting priority chemicals based on unique California circumstances. - Leverage the recently assembled U.S. Inventory Update report to provide initial volume, use and exposure information. Identify uses and user industries for the high priority chemicals that raise the greatest concern. Expect producers of priority chemicals and manufacturers with high concern uses to provide hazard and exposure information on those chemicals/uses to the program. - Provide the agency with authority and a due process to establish restrictions for uses of priority chemicals that have unacceptable risks. - Facilitate informed substitution in moving to alternatives for restricted uses of priority chemicals - Organize this overall effort in a collaborative approach involving chemical producers, targeted users/industries, the agency and appropriate academic and other 3rd party experts. - Engage with US EPA and the recently announced Canada-US-Mexico Montebello Agreement to avoid duplication and expedite action on priority chemicals in California and throughout North America. <p>Product Safety Management Systems—California should expect and encourage manufacturers of consumer and commercial products sold in California to employ comprehensive product safety management systems that include:</p> <ul style="list-style-type: none"> - Assessments to ensure the safety of products prior to marketing; - Rigorous control of production from raw material specifications, to formulation management, to process and quality control; - Safe operations that protect the health and environment of employees and the surrounding community; - Compliance with all applicable product safety, labeling and regulatory requirements including transportation, waste management and product disposal; - Constant vigilance in post market surveillance with rapid response to identified concerns; - Innovation that improves product performance, value and environmental quality based on life-cycle considerations;

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> - Transparency in communicating information about safety management systems and products; and, - Ongoing evaluation and improvement of systems performance. <p>Animal Welfare—In pursuing the objective of the Green Chemistry Initiative to expand toxicology information on chemicals, California should encourage the use of alternatives to animal testing and require testing only as a last resort.</p> <ul style="list-style-type: none"> - The agency and UC university system could work with other experts to provide assistance on alternative screening methodologies that can be utilized to provide adequate toxicology information for recommendations and decisions about priority chemical uses. <p>Transparency—California should take the lead in expanding the amount and ease of accessing Information on chemicals and product safety.</p> <ul style="list-style-type: none"> - Expect and encourage manufacturers of consumer products to communicate information about the ingredients in products, either on the package or on the internet at the manufacturer’s discretion and with appropriate provisions for protection of Confidential Business Information. - Expect and encourage chemical and product manufacturers to update their MSDS’s to the new 16-section ANSI standard and to reflect the latest hazard information from voluntary (e.g. HPV) and regulatory (e.g. Canada CMP) programs. - Encourage companies in important value chain sectors to work together to identify “beyond MSDS” information needs both upstream and downstream and to establish processes for communication to meet those needs. - Leverage California’s capability and interest to assemble a chemical information system on hazard, use and exposure from global sources. <p>Stimulate Green Chemistry Innovation—California should prime the pump to initiate early and significant advancements in Green Chemistry and to recognize and reward success.</p> <ul style="list-style-type: none"> - Provide economic incentives for business innovation in green chemistry. - Provide economic support and incentives for innovation at California’s University system: scholarships, research funds, technology licenses, etc. - Focus the above programs on development and commercialization of alternatives for restricted priority chemicals, including for small business application and on innovations that create breakthroughs in performance, value and environmental quality. - Develop a registry in which all stakeholders can document Green Chemistry successes - Develop an extension service through the UC university system to expand reapplication of successes across the potential user community. - Establish an Annual Green Chemistry Recognition program for new chemicals, products and processes and for advances in research, analytical and toxicological methods that best exemplify the objectives of GCI, - Continue the Conversation with California via ongoing workshops, symposia, and other communication approaches to maintain and build on the momentum established in the program to date. <p>November 15, 2007 Contacts: Bill Greggs, greggs.wj@pg.com Pat Hayes, hayes.pl.1@pg.com</p>
F-TD-37	<p>Fossil-fuel-based plastic use in our society continues to grow at an exponential rate, creating a plethora of environmental impacts for California, the oceans and, increasingly places like Lianjiao, China (see http://news.sky.com/skynews/video/videoplayer/0,,31200-greenbritain_china_p222,00.html).</p> <p>The State of California has one of the most impressive recycling mandates in the country but I am very concerned about where our recycling, especially our plastic, is going.</p> <p>Most consumers believe that their fossil-based plastic, once placed on the curbside for recycling has been taken care of in a way that renders any</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>potential problems with plastic waste solved. Myself and my colleagues at Green Sangha have been working over the past 2.5 years educating the public regarding plastic waste issues including pollution in the ocean. The central Pacific Gyre contains a plastic waste mass that has been measured to be larger than the state of Texas. Because plastic does not biodegrade, plastic entering the oceans remain there unless it is deposited on a distant beach. Fossil fuel-based plastic has entered the marine food web at many trophic levels impacting countless marine species (birds, salps, marine mammals, etc...please see: http://www.algalita.org/pelagic_plastic_mov.html) Small bits of plastic in the central Pacific Gyre outweighs zooplankton at a ratio of 6:1 (six pound of plastic for every pound of plankton!), according to research published by the Algalita Marine Foundation. Of greatest concern for my organization and me right now is what is happening to our plastic waste once it leaves the US shores not as litter but as commerce. At the link, http://news.sky.com/skynews/video/videoplayer/0,,31200-greenbritain_china_p222,00.html please find some news footage shot by Sky News in the UK. This news story highlights the situation that Californians don't know about and never see. It is the story of the dark side of plastic downcycling that all policy makers need to see, we believe. This short news piece is of great importance regarding plastic policy here in California. The plastic industry continues to repeat the mantra that plastic is fine; we must continue to use it but we need to do a better job recycling. I'd like the Green Chemistry Initiative to first acknowledge that fossil plastic is downcyclable not recyclable. And that most of our fossil plastic waste is being shipped overseas and being handled under conditions that are harming water, air, public health and the land surrounding so-called recycling facilities. In the video workers are exposed to mountains of unsanitary plastic waste. They melt it down and/or burn it; smoke and ash fills the air. Untreated polluted water runs into local streams turning them dark grey; they too are littered with plastic and ash. Workers are subjected to toxic fumes and heavy metals where PVC is downcycled without any idea that their work is dangerous.... Needless to say, there are no health or environmental standards in places such as Lianjiao, China. Our continued embrace of plastic needs to be looked at with a cradle-to-cradle perspective, which requires a close look at what is happening overseas. The Green Chemistry Initiative is for California, but for the initiative to have integrity in cannot be part of exporting waste that is causing great harm overseas. We in California need to develop closed-loop safe and just ways of handling our waste. The current model of exporting plastic to countries such as China needs to be stopped if California is serious about its Green Chemistry Initiative.</p> <p>Andy Peri Green Sangha</p> <p>Further information provided: a link to the short online version of the video described above and some articles regarding waste exports to China.</p> <p>on behalf of Andy Peri</p>
F-TD-38	please stop testing on animals! there are alternatives--use them!

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-39	<p>GREEN CHEMISTRY AND BEYOND: SUSTAINABILITY, SAFETY AND CONTINUAL IMPROVEMENT</p> <p>INTRODUCTION Earlier this year, California kicked off its Green Chemistry Initiative with the stated goal of taking a collaborative approach to significantly reduce the impact of toxic chemicals on public health and the environment. The Soap and Detergent Association provides the following comments on behalf of its members so that California may consider new ways to manage chemicals towards the continual improvement of public and environmental health. The Soap and Detergent Association (SDA) is the non-profit trade association representing manufacturers of household, industrial, and institutional cleaning products, their ingredients and finished packaging; oleochemical producers; and chemical distributors to the cleaning product industry (http://www.cleaning101.com/). SDA members produce more than 90 percent of the cleaning products marketed in the U.S. SDA members strive to meet the commitments of a sustainable industry: 1) advancement of social well-being, 2) advancement of human health and environmental quality, and 3) economic growth. Cleaning products have been an integral part of the dramatic advancements in public health and longevity, and the decline of communicable diseases throughout the world over the past two centuries. SDA and its members have been at the forefront of research on the environmental and human-health safety of their products for the past 50 years, and a culture of innovation and continuous improvement among its members has resulted in a robust industry that is a leading contributor to the public health across the country.</p> <p>SUSTAINABILITY</p> <p>Social Sustainability SDA members are committed to contributing to a better quality of life for our consumers, business partners, employees and the communities in which we operate, and to maintaining a high level of product stewardship throughout the chain of commerce. As such, we believe that decisions of preferability and substitution should be based on the comparative life cycle impacts of a chemical and its potential substitute. While a safety-based characterization scheme may focus on toxicity, persistence and bioaccumulation, there are a number of other parameters which are relevant to the sustainable use of a particular chemical in a formulation such as raw material sourcing and carbon footprint. All relevant aspects of sustainability should be taken into consideration for a potential substitution decision. Similarly, any plan to consider substitution of chemicals should require that the efficacy and benefits of that compound be considered as any diminution of efficacy may negatively impact public health and well-being through reduced hygiene and sanitation.</p> <p>Environmental Sustainability Cleaning products are chemical formulations, and generally each ingredient in a formulation will have some measurable toxicity. However, the use of cleaning products generally is well understood, leading to sound characterizations of exposures and risks. SDA members are committed to the enhancement of human health and quality of life through the responsible formulation, production and sale of cleaning products and ingredients, and their proper use. SDA members only market products that have been shown to be safe for humans and the environment, through careful consideration of the potential health and environmental effects, exposures and releases that will be associated with their production, transportation, use and disposal. In determining the safety of cleaning products, toxicity of ingredients to humans and wildlife is studied.</p> <p>Economic Sustainability The cleaning products industry is an important component of this nation's public health infrastructure and a contributor to the nation's economic well being. As such, it is important that the Green Chemistry Initiative not compromise this industry. SDA members are committed to innovating to improve products both in terms of performance and environmental impact. The Green Chemistry Initiative must ensure that product efficacy, performance, and usability are not undermined, and that the ability to innovate is not compromised. In fact, California is uniquely well positioned to foster innovation in Green Chemistry and product formulation. With a strong educational system including world-class research university and a robust high technology sector, California has the means to lead the world in developing and commercializing alternatives to high priority chemicals of concern. The Green Chemistry Initiative should include a significant component related to research and development of alternatives for high priority chemicals which</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>leverages California's intellectual resource. Through such efforts, California could facilitate the development and application of chemicals that will reduce negative impacts to the citizens of California.</p> <p>SUGGESTIONS FOR CALIFORNIA</p> <p>Confirming the Baseline Safety of Chemicals in Commerce</p> <p>In order to affect the impact of toxic chemicals on public health and the environment, the inherent hazards and potential for exposure should be integrated into a risk framework, and risks should be managed appropriately. Currently, there are several national and international programs designed to evaluate and manage the risks of chemicals. California should leverage existing efforts and customize results to meet their needs. For example, in Canada, Environment Canada completed a prioritization exercise of 23,000 chemicals on their Domestic Substances List (DSL) in 2006. Using information from Canadian industry, academic research and other countries' data, Government of Canada scientists worked with partners in applying a set of rigorous tools to the 23,000 chemical substances on the DSL. They were categorized to identify those that were: inherently toxic to humans or to the environment and that might be persistent and/or bioaccumulative, and substances to which people might have greatest potential for exposure. From this exercise there were over 4,000 chemical substances identified as needing further attention, and about 19,000 (over 80% of the total) were set aside as not needing further action based on their hazard and exposure profiles. Among the chemicals needing further attention, 500 were high priority, 2600 were medium priority and 1200 were low priority, and most of the low priority chemicals were eliminated from consideration. Additionally, about 150 of the high priority chemicals were determined to not be used in Canada and were restricted from further use without an evaluation. In the end, Canada has moved forward to consider about 350 high priority chemicals and 2700 medium priority chemicals.</p> <p>California could focus on the 500 high priority substances identified in Canada's program. To address unique circumstances that might exist in California, the State could have a process to add substances to the high priority list, as necessary, based on hazards, uses and exposures to workers and consumers in California. Once the high priority chemicals are identified, use and exposure should be considered to determine whether there are impacts on human health and/or the environment. The State could work in coordination with other North American initiatives (e.g., Canadian Domestic Substances List prioritization, EPA and OECD High Production Volume Chemical programs, Security and Prosperity Partnership (SPP) of North America Regulatory Cooperation Framework) in order to assess the risks of the highest priority chemicals. In undertaking such programs, SDA urges the State to proceed with any chemical assessments in a manner that would avoid unnecessary animal testing. In cases where real impacts exist, risk management strategies should be implemented in order to reduce those impacts, including use-specific restrictions where there are unacceptable risks.</p> <p>Continual Improvement of the Safety Profile of Chemicals in Commerce</p> <p>California can continually improve the safety profile of chemicals in commerce in the State by focusing on the high and medium priority chemicals in use, and using Green Chemistry and other tools to facilitate informed substitution with chemicals having an improved safety and life cycle profile. There are a number of opportunities for California to apply its resources towards traditional Green Chemistry activities. California could leverage the universities in the State and the high-tech business sector towards the development of alternative chemicals for those of the highest priority, and development of alternative manufacturing processes for those with high discharges of hazardous waste. For alternatives identified, there should be a separate Life Cycle Assessment by an outside party, or state-funded Center for Excellence in order to confirm that there is no loss in performance with the alternative, to avoid unintended consequences, and to assist in commercialization. The State also could develop a Cooperative Extension-type program to assist companies in Cradle-to-Cradle product design/formulation and assist in adoption of new alternative chemistries and processes. In order to facilitate informed substitution of high priority substances towards those with a more favorable environmental and human health profile, the State could develop database of chemical alternatives that compares a number of sustainability parameters: performance, price, human health and environmental (e.g., toxicity, bioaccumulation, persistence) including carbon footprint and source sustainability. Additionally, the State could map the flow of chemicals in California using information drawn from existing sources such as EPA's Inventory Update</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Reporting (IUR), the data received by Canada during its data call-ins for high priority chemicals, and other contributions from the public. In order to assess the performance of these programs and measure the impact of these reforms, the State should monitor metrics that will assess releases of chemicals to the environment and exposure to humans.</p> <p>Increased Transparency and Access to Information on Chemicals in Commerce</p> <p>California could expand access to information on chemicals for consumers, businesses and regulators by leveraging its preeminence in data management and mining in order to organize the world's chemical data. For example, the dossiers for the EPA High Production Volume (HPV) Chemical Challenge program, and the related European program are often difficult to find and the data difficult to extract. By partnering with the information technology sector (e.g., Internet search firms), the State could expand access to chemical information, support its local industry and raise awareness of chemical safety information currently available. Additionally, California could expand product-specific chemical ingredient disclosure for consumer products which currently do not have that requirement. To increase transparency and improve the management of chemicals in the workplace, California should adopt the 16-section Material Safety Data Sheet (MSDS) described by ANSI Standard Z400.1-2004.</p> <p>Recognition and Rewarding Success</p> <p>As California's Green Chemistry Initiative unfolds, it will be important to recognize efforts and reward successes. The State could establish a registry for companies seeking to align their business practices with the Green Chemistry principles and acknowledge their intent. Similarly, the registry could accumulate examples of product development decisions and substitutions that have resulted in reduced waste produced and energy inputs. The registry could be the basis for recognition of successes in reducing impacts from chemical exposures similar to the Presidential Green Chemistry Challenge Award, but focusing on results achieved through implementation of a program or application of a new chemistry rather than development of a new technology.</p> <p>SUMMARY</p> <p>California's Green Chemistry Initiative should emphasize all three components of sustainability: the social benefits of chemicals and products, the economic contributions through innovation and improved performance, and the environmental and human safety. California can confirm the baseline safety of chemicals through a prioritization based on hazard and exposure, assessment of risk, and management of risks including use-specific restrictions where necessary. California can drive innovation, the benefits of products and the continual improvement of the safety profile of chemicals by leveraging the State's expertise, and applying resources to the application of Green Chemistry research and development. California can expand access to information on chemicals in order to improve decision-making by taking advantage of their data management industries to organize the world's chemical data, and by increasing the disclosure of chemical ingredients in consumer products. Once California has implemented its Green Chemistry Initiative, it should recognize the efforts of those industries seeking to apply the principles of Green Chemistry and provide recognition to those that have had notable success.</p>
F-TD-40	We are sick of you scientists testing on animals for our needs. Find other alternatives. Now.
F-TD-41	please end testing of chemicals on animals....I want BOTH the earth and its animals to thrive. Living organically and chem-free is a must if nature is to come into balance.

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-42	<p>The following is feedback to the questions provided by the Department of Toxics Substances Control. After over 16 years of environmental engineering experience working for the Department of Defense (DOD), two tools have been identified that require coordination and work to fully implement. These tools are standardization of the LCA process as feasible covering most products and the Chemical Compliance Systems (CCS) quantitative analysis database programmed with data to rank any chemical relative to the universe of chemicals (quantitative analysis) and compare to the regulatory limits using the standardized environmental performance characteristic data provided by EPA and CAL EPA.</p> <p>With some work, these approaches would significantly improve the environment. At DOD and with those I interface with in the DOD and industry, it not a question of the intention to improve the environment and work "beyond compliance," but is a question of providing key data to the chain of industries moving product to market. This is now possible utilizing the CCS tool or similar applied to the LCA stages.</p> <p>Beyond the work, is a key to require manufacturers of chemicals, substances and products to provide both the hazardous chemicals in the Materials Safety Data Sheet (MSDS) and the nonhazardous chemicals so that a valid green rank score and comprehensive report may be provided via the web on-line automatically and real time. The report contains all the CALEPA and FED EPA environmental characteristics of concern with a normalized Environmental SCORE organized by the key areas ECOLOGY, HUMAN HEALTH and HUMAN SAFETY.</p> <p>Utilization of the ISO 14001 Environmental Management System (EMS) continual improvement for the environment of sustainability is an active process in DOD and city municipalities in whole or part that provides the management approach. Key is feedback to the manufacturers of chemicals, academia, industry, consumers etc so that the best choice for the environment may be made by all.</p> <p>This will mitigate the predicted increase of toxic pollution in the environment by CAL BERKLEY (see www.ucop.edu/cpre) "Special Report" Green Chemistry in California despite all the effort.</p> <p>Beyond Compliance is normal standard practice by DOD and industry. The key is quality real time information feedback to make the best choices by all involved in the "Cradle to Cradle" process of manufacturing-construction-R&D. As a team much is possible. Playing this in parts and pieces is not efficient.</p> <p>Further comments on Cradle to Cradle, Green Chemistry and Toxics in Products by Design.</p> <p>on behalf of Ray Paulson, P.E. Fleet Readiness Center Southwest North Island</p>
F-TD-43	<p>I agree that information is key for companies and consumers to make the best decisions regarding the chemicals/products they choose. However, I would respectively suggest that an ideal model is not one with data to rank any chemical relative to the universe of chemicals (quantitative analysis). Ultimately, we need a system that focuses on a chemical's rank relative to environmental performance and impacts on health, including worker health. While, in cases where there are not clear alternatives, we may have to gauge toxic chemicals in terms of the lesser evil, but our ultimate goal, and that of the Green Chemistry Initiative, should be in my view, one of measuring against the impacts of a particular chemical. The development of green chemistry should be seen and implemented as a means of developing alternatives that don't have to be compared on a scale of harm because they are designed so as not to be harmful. Granted that this is not easy, but what are goals are now will determine how successful we will be later.</p> <p>November 14, 2007 Andria Ventura, Clean Water Action</p> <p>The CCS tools referred to by Mr. Paulson both "rank any chemical relative to the universe of chemicals [across 43 ecological, health and safety endpoints] as he indicated AND rank each chemical "relative to environmental performance and impacts on health, including worker health" [and safety] as Ms. Ventura requested.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-44	<p>CCEEB believes that an effective green chemistry program should consider the concepts of risk management and net benefit as elemental to identifying topics of focus for this Initiative.</p> <p>“Risk” is usually expressed as a probability that an event will occur. Expressing risk in this way allows relative comparisons to be made about exposures to various substances and events. For example, expressing risks as a probability allows us to compare a variety of risks associated with daily living as shown in the table below:</p> <p>RISKS OF DAILY LIVING</p> <p>Relative Risk Type of Risk</p> <p>0.2 Disease from PCBs in diet</p> <p>0.3 Disease from DDT and DDE in diet</p> <p>1 Disease from drinking 1 quart of municipal water per day</p> <p>18 Dying by electrocution in any given year</p> <p>60 Disease from drinking 12 oz. of diet soda per day (saccharin)</p> <p>367 Falls, fires, poisonings in the home</p> <p>667 Respiratory illness caused by air pollution (Eastern U.S.)</p> <p>800 Dying in auto accident in any given year</p> <p>2,800 Disease from drinking 12 oz. of beer per day</p> <p>112,000 Disease from smoking one pack of cigarettes per day</p> <p>Chemicals are not inherently risky. Rather, risks result from a combination of several factors including a chemicals’ potential hazard, potential routes of exposure and dose- response relationships.</p> <p>An assessment of risk results in an understanding of the level and type of risk associated with a particular substance. Once that risk is understood, steps can be taken to manage it. Risk management efforts can involve a variety of approaches such as:</p> <ul style="list-style-type: none"> • Substituting alternative input materials, • Making process changes during manufacturing, • Installing technological controls (e.g., pollution control equipment), • Requiring use of personal protective equipment, • Instituting a range of pollution prevention options, • Training, • Labeling, • Imposing various storage, transport and disposal requirements, <p>This is a short list. There are many other regulatory and voluntary efforts to protect workers, the public and the environment. These efforts are embodied in the numerous Federal, state and local statutory and regulatory programs that require a wide range of existing, ongoing and active risk management</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>processes that are already being implemented by California's regulated community. Further, industries have undertaken many voluntary risk management efforts at their facilities worldwide.</p> <p>In addition, risk must be weighed against net benefit. There are many chemicals in use today that could pose a hazard if used improperly but have a net benefit that makes the risk acceptable. Common household cleaners like beaches and detergents are examples of chemicals that could pose a risk if used improperly, but are ubiquitously present in households in California because of their net benefit. Chlorine used to purify drinking water and fluorine added to drinking water by many communities to fortify teeth. Both of these elements are highly toxic in concentrated form and yet serve important community public health functions. Another example of the inherent net benefit of using individually toxic and highly reactive chemicals is the combination of butadiene and styrene to produce latex, a synthetic rubber and a safer paint product. Agencies developing California's Green Chemistry Initiative must realize the importance of applying the concepts of risk management and net benefit in developing and implementing the Green Chemistry Initiative.</p>
F-TD-45	<p>I respectfully disagree that we can rely on a risk management or risk assessment model to protect human health and the environment from the impacts of toxic chemicals. As stated in a recent letter submitted by the CHANGE coalition, of which Clean Water Action is a member, "Assessment of chemicals should focus on their intrinsic hazards and move away from reliance on time-consuming risk assessment methods that can be readily manipulated. Assessments should integrate the concepts of "cradle to cradle" and alternatives assessment to look for the least hazardous options in all cases. Furthermore, they should be based on the most sensitive criteria, such as the need to protect vulnerable human populations, endangered species, or water quality..."</p> <p>It has been our experience, working with communities, that in reality, toxic chemicals will out. If risk management is truly effective, why do we find toxic chemicals in our bodies, our water, and our air? Why is it that despite the difficulty of showing cause and effect in many cases, scientific evidence continues to mount demonstrating that many health and pollution impacts are tied to chemical use and release? Why are 1500 cases of preventable illness tied to chemical exposures in the workplace diagnosed monthly in California? And how do we determine cumulative impacts, even when the chemical mixtures we are exposed to contain "safe" levels of individual constituents? In fact, while we argue about the level of risk a hazardous substance may pose, the actual impacts occur.</p> <p>As for weighing benefits, such an analysis must also consider the "externalities", such as costs to communities in terms of lost wages from sick leave, health care costs, environmental degradation and the economic impacts that brings, expensive clean up actions, higher education costs due to higher rates of behavioral and developmental problems in highly exposed populations, etc. These are difficult things to quantify, but they are key if we wish to accurately weigh benefits vs. risk.</p> <p>No matter how well toxic chemicals are managed, there is the problem and cost of disposal at the end of the life of the products or processes in which they are used. We simply have to point to the mountains of electronic waste to demonstrate the impacts that these chemicals can have. It may be argued that we can impose rules on manufacturers, requiring take back and recycling, but we must also remember that those processes in themselves are expensive and have their own environmental or health impacts.</p> <p>Finally, I would suggest that moving toward a model in which hazard traits are prioritized will be essential in protecting and growing the California economy. As someone who comes from a business background, I believe that it really doesn't matter if stronger regulations in the EU and elsewhere are correct or not. The reality is that if our industries wish to compete in those markets, they will have to adapt. While the EU may accept risk management as a premise, hazard trait analysis can provide our companies with a competitive advantage by enabling them to develop/choose safer alternative chemicals and to respond to shifts in international regulatory frameworks as they occur.</p> <p>At the risk of sounding naive, I wonder why we want to stay with a model that requires us to accept a certain degree of harm (for example, acceptance that some percentage of the population will get cancer) and burdens us with the difficulty and cost of managing exposure instead of focusing on creating non-toxic alternatives from the beginning. I do not, for a moment think that we can change overnight, or that it will be easy. But by relying on old models,</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>we will not even approach a more sustainable way of production. Those industries and businesses that look at the real, unadulterated impacts of their decisions (in this case, the hazard traits of chemicals they use) will be in the best position to innovate and avoid negative consequences down the line. And they will be the ones that will enjoy a sustainable future.</p>
F-TD-46	<p>The California Green Chemistry Initiative (GCI) is an innovative mechanism with the potential to influence the design of products in ways that reduce the use of harmful chemicals and generate less waste and pollution. The objective to create partnerships between industry, the public, and government agencies to bring about this change represents an interesting social experiment. The success of such partnerships will surely rest upon the ability to simultaneously meet the competing needs of all stakeholders. Chemical Compliance Systems, Inc. (CCS) believes we have unique resources that can effectively assist California result in successfully establishing GCI partnerships.</p> <p>CCS has compiled the largest and most accurate relational hazardous chemical/product and regulatory databases in the world over the past 22 years. These unique databases have been derived from over 1,000 sources and are currently comprised of approximately 75,000,000 data elements for 210,000 chemicals, 350,000 products and munitions, and 650 local, state, federal, international and nongovernmental organization regulations. These databases are maintained current, expanded on a daily basis, and are constructed to facilitate utilization of discrete elements in a wide spectrum of analytical compliance systems. CCS has currently developed 13 nonmunition and 10 munition Web-based analytical compliance software modules that utilize different elements from these databases and could immediately be implemented, or easily be customized, to support GCI requirements/needs. In addition, CCS has developed eight detailed concepts that will apply to more broadly defined GCI considerations.</p> <p>CCS has been working to “green” products and the environment for nearly 10 years. We currently have four separate, but equivalent, Web-based “green” analytical compliance systems for chemicals, products, processes and munitions. Each of these four modules utilizes the same 43 specific ecological, health and safety criteria to quantitatively evaluate the “greenness” of a chemical, product, process (including wastestreams), or munition. Each of these systems also includes alternative product/process constituent chemical data tables to facilitate the selection of a less harmful ingredient. In combination, the “green” product/munition and process modules provide a complete life cycle (i.e., “cradle to cradle”) analytical capability. Each has product design and evaluation capabilities that enable chemists/engineers to design “greener” products/processes upfront, and acquisition, regulatory and ecological/health/safety professionals to assess, or compare, the “greenness” of the overall product/process (wastestream) to the level of detail they require. Each of these modules also simultaneously identifies the regulatory impact of the overall product/process, parts or components, or individual constituents. These tools will enable California regulatory agencies to partner with industry and the public to establish objective and quantitative “green” standards, or performance measures, for products and processes that can be incrementally increased over time and apply fairly to both small and large companies. The utilization of harmful chemicals will be reduced and less waste and pollution will be generated. The “green” standard will be a known, level playing field for industry, and the result will be greater protection for workers, the public, and for the environment. These “green” capabilities have also been incorporated into a Web-based Chemicals of Concern module that can quantitatively rank the concerns for a chemical/product inventory at a facility, thereby focusing alternative chemical acquisition, or research, on the worst offenders first, effectively accelerating pollution prevention.</p> <p>CCS regulatory compliance capabilities draw upon our List of Lists data that currently includes 650 state, federal, international, and nongovernmental organization lists and associated data. Our Web-based compliance capabilities are available as standalone modules, or incorporated into other analytical tools (as described above). Compliance assessments can be applied to facility inventories, products/processes, waste classification, and/or CERCLA/RCRA site remediation. CCS is scheduled to develop a new, Web-based Health Risk Assessment module for the U.S. Army that will utilize our</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>existing, Web-based Conceptual Site Model, and simplify RCRA Subpart X and CAA Title V Permit applications. Finally, CCS has conceptualized a Chemical Homeland Security System (C-HoSS) that will utilize existing facility chemical/product inventories to quantitatively rank resident chemical hazards, security risks and mortality risks by location at the facility. These three reports quickly prioritize inventory concerns. Entry of container accessibility constraints (i.e., storage conditions that control access) for chemicals of greatest concern enables C-HoSS to rank container vulnerabilities and identify accessibility requirements to nullify all vulnerabilities. C-HoSS concern levels are made proportional to the Homeland Security Advisory System daily risk levels. C-HoSS addresses all four levels in an effective security program (i.e., vulnerability assessment, corrective strategy, third party verification, and management system incorporation). C-HoSS will be a good tool for effectively eliminating terroristic chemical vulnerabilities at a facility. In addition, C-HoSS could have direct utility for preparation of California permit-required Security and Emergency Response Plans. Implementation of C-HoSS across the entire State of California can be accomplished "free," utilizing a state grant for "equipment" from the Department of Homeland Security.</p> <p>CCS hereby offers to provide a remote demonstration of our existing Web-based capabilities and detailed concepts, at no charge, to any parties interested in their potential utilization in support of the California GCI, to achieve corporate "green" objectives, or to utilize in "green" product acquisition.</p>
F-TD-47	<p>As a taxpayer of California, I strongly urge you to stop all animal testing and instead implement developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes.</p> <p>Thank you, Janet Girard</p>
F-TD-48	<p>Please abstain from using animal-based toxicity testing. It is not necessary. I am a California resident and an environmentalist, and I would be very upset if your plan to save the environment included the degradation of animals. Please act responsibly and do not embarrass yourself any further.</p> <p>Devri Speaks of Laguna Beach CA</p>
F-TD-49	<p>Vivisection is scientific fraud and science GONE MAD. Its only purpose is to save corporations from lawsuits. How can these vivisectors have had such an extensive education - but haven't come to the conclusion that animals' physiological makeup is COMPLETELY different than ours. Animals' systems have such a different reaction to certain drugs and/or medications than we would.</p> <p>The slave trade is alive and kicking. Has been for years and years. Animals ARE NOT OURS to kill and eat, wear, experiment on, use for clothing. They are not ours to exploit either (circuses, zoos, Sea World, etc.)</p> <p>VIVIssectVI (Roman Numerals 666)</p>
F-TD-50	<p>Animal testing is NOT science! Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-51	<p>My name is George Kopcsak. I am the former Deputy for Munitions in the Office of the Secretary of Defense. During that time efforts were initiated to accelerate the demilitarization (DEMIL) of approximately 1 million tons of old, outdated, unstable and/or incompatible munitions in our nation's stockpile. Initially this was accomplished through open burn and open detonation techniques. More recently there has been much focus on more environmentally friendly means to destroy munitions or to recycle the components. Some of this work is done within the state of California.</p> <p>Within the past decade a small business organization, Chemical Compliance Systems (CCS), has developed a metric to determine the environmental impact when differing DEMIL techniques are utilized. This metric is called the Green Munitions Analytical Compliance System (G-MACS) and was sponsored and initially funded by the US Army. I'm happy to say that this tool now exists on the web. Since this tool evaluates the ecological, health and safety risks associated with munitions by breaking each down to the chemical level I have learned that the tool can also be used by munitions designers and producers to evaluate the environmental impact of specific chemicals used to make the devices. The designer now has a tool to change specific components within a munition design and determine its positive impact on the "Greenness" of the design. The idea can now be carried forward to look at designing munitions to ease the environmental impact of its anticipated DEMIL 20 years down the road.</p> <p>Since CCS has focused on munitions at the chemical level they have been able to broaden their "compliance system" tools looking at any and all products being designed, produced, or destroyed as long as the chemical composition is known. This looks like a good fit with the California Green Chemistry Initiative. I believe that you should seriously consider its use.</p> <p>As a final note, the web-based CCS tools (G-MACS, GP-CAS, and G-MACS) appear to have the capacity to look at chemical compatibility issues related to their close proximity with a product design. This may well become important when one considers the environmental impact of munition/product aging or temperature cycling.</p> <p>Please give these tools a look.</p>
F-TD-52	<p>We know the material is already toxic. Use the computer formats and technology that we now have and stop committing suicide on helpless beings. You know they will die if you touch them with this stuff. Look what the oil spill did to thousands of birds and eco systems by just touching the oil. The planet is toxic enough. Stop wasting money on all of the toxic materials we are using and begin to look how we can stop this mania on beings which includes humans. Why don't you test the french fried potatoes at McDonalds. Now that is toxic to humans. They never break down - can you imagine what that does to a system of the body. Now that is toxic. Wake up people.</p>
F-TD-53	<p>I fully support the goal of protecting my native state's environment. It is important, however, that we use the best and most effective methods. In addition to being staggeringly cruel, animal testing is notoriously unreliable. The human body responds differently to toxins than do the bodies of other mammal. Human tissue tests and computer modeling are both ultimately more reliable and infinitely kinder.</p> <p>Green is good. But real "Green" ethics require a respect for life, including the lives of animal subjects. Please do not consider animal testing in any form for this program.</p>
F-TD-54	<p>A green research group would evaluate existing data first and pursue more modern testing techniques than utilizing and abusing animals for science. Animal testing for toxicity is both inaccurate and cruel. Please use alternate methods for your studies. Many chemicals have already been tested in government research programs.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-55	<p>The Dow Chemical Company (Dow) appreciates the opportunity to provide additional comments on a recent discussion initiated by the California Environmental Protection Agency on chemicals management policy. As a company providing products and services in over 175 countries, we comply with a broad range of chemical management policies and programs. Dow supports a consistent, coordinated regulatory environment for products at global, national and regional levels to complement industry voluntary efforts and to ensure a level playing field. Where new regulations are required, they should be based on established scientific risk assessment and risk management principles – predictable, flexible and capable of responsibly addressing society’s economic, environmental and safety requirements. We recognize that regulatory systems will inevitably vary by country since they must work effectively within the broader statutory and regulatory framework for each country. Nevertheless, we generally support broad regional programs that provide the greatest consistency and uniformity for the industry as a whole.</p> <p>As a result, Dow is not an advocate for any particular program. Instead, we have developed a set of principles for effective chemical management programs. As governments select specific legislative or regulatory approaches to product safety or chemical control policies, we believe that certain principles should be adhered to, and we present them below.</p> <p>on behalf of Dow Chemical Company</p>
F-TD-56	<p>As an informed citizen of California, I must stress the importance of researching and developing human-focused testing methods, such as cell and tissue assays.</p> <p>California’s implementation of Green Chemistry goals should mirror the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p> <p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p> <p>It only makes common sense for data gathering requirements to take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific</p>
F-TD-57	<p>The Bromine Science and Environmental Forum (BSEF) is pleased to offer the following recommendations to the California Department of Toxic Substances Control (DTSC) for your consideration in developing and implementing the Cal-EPA Green Chemistry Initiative.</p> <p>Summary:</p> <p>The guiding principle for this proposal is that it relies on successful management of chemicals already in the marketplace according to their characteristics and actual uses, rather than simply banning substances. This focus recognizes the important difference between risk and hazard, i.e., that hazardous substances properly managed may not pose actual risks, and would create a system that is based on successful management of identified risks, as opposed to establishing prohibitions based on potential hazard.</p> <p>on behalf of the Bromine Science and Environmental Forum (BSEF)</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-58	In this day and age it is clear that hurting innocent animals in toxicity tests is unnecessary and beneath us as a race, as well as misleading and possibly seriously inaccurate. How toxins and potential toxins may affect longer-living creatures such as humans should be tested through human cell and tissue methods. There are already enough differences among humans' response to toxins with regard to our age, weight, gender, etc. There is no need to add information on how poisons will affect a completely different species when it involves intentionally harming them. I'm sure that our state, which presents itself as compassionate and forward-thinking, will have a humane, socially-elevated, intelligent approach to these tests and use non-animal methods. If not, then California would not be an example to the rest of the country and would fall short of most Californian's expectations. The goal should be to protect all life from harm whenever possible, especially under the title of "Environmental Protection."
F-TD-59	it would be ridiculous to try to accomplish such a task and it is not efficient and is useless. California citizens should be embarrassed that their state is trying to take technology and civility back a century.
F-TD-60	It is my hope that all of God's creatures be treated fairly, kindly and with respect. Be proud of what you do and the results you achieve at all times!
F-TD-61	<p>Animal testing is unreliable, inhumane and selfish.</p> <p>I believe it was Gandhi who said "one can measure the progress of a nation by the way it treats it's animals." Based on this barometer, we Americans have much progress to make.</p> <p>As a citizen of California, I care deeply about protecting the environment and animals, whether wild, livestock or pets.</p> <p>Through circulating a petition to gain humane treatment of farm animals, I've learned how most people care as deeply as I do about these same issues. Protecting the environment is in the interest of every Californian. However, understanding the toxins in our environment need NOT be at the expense of defenseless animals.</p> <p>We need to get a handle on the toxic chemicals in our environment by developing and using cost/time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes.</p> <p>California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p> <p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p> <p>Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies.</p> <p>Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p> <p>Thank you for your consideration and compassion for all living beings.</p>
F-TD-62	<p>Dear Sir,</p> <p>Using animals to test toxicity of drugs, chemicals, and other products makes about as much biological sense as using horse urine to produce PreMarin and other drugs for women who are going through the change of life. It makes no sense to develop a product from a creature whose biological structure is absolutely foreign to our own. In the end, the only result is that the animal dies. There are other, more accurate, and less costly (and less deadly) ways to test drugs, chemicals, and other products than to test them on an animal when you already know up front that the results that you get will have no relevance to how it would react on a human. With all of the science and technology, not to mention the people who do this work are usually highly educated, why doesn't someone (or a team) put their heads together and develop a method or methods that have true value, will yield results that actually make sense, and save money?</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-63	It is truly barbaric that we continue to test on animals in the 21st century. Surely, there are more accurate, humane ways of finding cures for diseases. We should treat all forms of life, not just humans, with reverence and respect. I don't know how anyone can look into the terrified eyes of a chimp, cat, dog, or mouse and inflict pain and suffering in the name of science.
F-TD-64	To know animals suffer, and to think, experiment anyway, shows "mental illness." The horrifying reality is, this lack of empathy is pervasive in most humans. We need to concentrate on the human brain, specifically to figure out how to fix this sickness.
F-TD-65	<p>Please don't test on animals! It's not ethical, appropriate, or feasible to subject every chemical to a fixed list of animal tests. Animal tests do not protect human health and can use hundreds and even thousands of animals per chemical. In order to get a handle on toxic chemicals in our environment, California should develop and use cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods, and intelligent, tiered testing schemes—not cruel and archaic animal methods.</p> <p>Only human-focused testing methods such as cell and tissue assays should be used.</p> <ul style="list-style-type: none"> • Animal-based toxicity testing methods are dismally inaccurate, and they result in the painful deaths of hundreds or thousands of animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these outdated testing methods. • Thousands of chemicals have already been tested in other government programs, and existing data must be gathered, fully evaluated, and used prior to initiating further testing requirements. <p>CalEPA please protect both the environment and animals!</p>
F-TD-66	Animal testing is cruel and unreliable. There are numerous examples of substances that are toxic to animals, but not to humans, and vice versa. Perhaps the most famous example is penicillin, fatal to some animals, but a lifesaver to humans. Far more accurate and humane alternatives to animal testing exist. Let's use them and ban all animal testing!
F-TD-67	animal testing is barbaric,immoral and wounds all of creation especially humankind! All of creation that shares this planet with us are inextricably linked with us more than we realize and when we violate any part of nature most especially the animals that are sentient beings we damage, wound and cause harm to all of us. Animal testing is spinning wheels in the dark and can only lead to a downward spiral of destruction for our whole planet earth!!! Animal abuse (which is testing as well) is based on lies and will bear no good fruit - seek the TRUTH and we will all be Blessed!!! Sincerely, Margaret Rose Rivera
F-TD-68	animal testing is barbaric,immoral and wounds all of creation especially humankind! All of creation that shares this planet with us are inextricably linked with us more than we realize and when we violate any part of nature most especially the animals that are sentient beings we damage, wound and cause harm to all of us. Animal testing is spinning wheels in the dark and can only lead to a downward spiral of destruction for our whole planet earth!!! Animal abuse (which is testing as well) is based on lies and will bear no good fruit - seek the TRUTH and we will all be Blessed!!! Sincerely, Margaret Rose Rivera

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-69	<p>IF YOU SUPPORT SUFFERING, YOU WILL SUFFER. IF YOU SUPPORT TORTURE, YOU WILL BE TORTURED. IF YOU SUPPORT KILLING, YOU WILL BE KILLED. IF YOU SUPPORT EATING LIVING CREATURES YOU SHALL BE EATEN. IF YOU SUPPORT LOVE, YOU WILL BE LOVED. IF YOU SUPPORT LIFE, YOU WILL LIVE. IF YOU SUPPORT FREEDOM FOR ALL LIVING CREATURES, YOU WILL BE FREE.</p> <p>Book: "The World Peace Diet" by Will Tuttle, PhD. We are called to be caretakers of God's Creation not tyrants over God's creatures.</p>
F-TD-70	There has to be a better way, please stop testing on animals.
F-TD-71	<p>PLEASE ANSWER TO THE 21ST CENTURY AND FOREVER END, STOP ANIMAL TESTING!!!!!!!!!!!! NO MATTER WHAT YOU THINK, ANIMALS DO HAVE FEELINGS, BOTH EMOTIONAL AND PHYSICAL....CRUEL TESTS HAVE PROVEN THIS! PLEASE LEAVE A HUMANE LEGACY FOR YOUR CHILDREN AND THEIR CHILDREN! STOP AND END THE USE OF HELPLESS ANIMALS FOR TESTING POISONOUS CHEMICALS AND WASTE FOR THE SAKE OF OUR SELFISH HUMANITY. THERE ARE BETTER, SAFER AND WISER WAYS OF TESTING TOXIC MATERIALS.</p> <p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p>
F-TD-72	California can minimize animal testing by utilizing information from test programs that are planned or already underway. The U.S., Canada and Mexico have now agreed to a program to screen thousands of chemicals to see if further research is necessary to protect human health. It will follow work already being done in Canada prioritizing chemicals based on whether they show strong evidence of persistence, bioaccumulation and toxicity. USEPA has ongoing projects with the domestic chemical industry to gather data about large volume chemicals and fill in necessary information gaps. California should piggy-back any new chemical policy onto these programs rather than try to create its own testing agenda.
F-TD-73	This isn't the 1900 anymore, science as developed more reliable methods that do not involve the torture and destruction of helpless animals
F-TD-74	Animal testing should be outlawed. Thousands of innocent lives are lost for testing and because Animal and Humans react differently with chemicals, testing is inaccurate
F-TD-75	I'm writing in support of The Physicians Committee for Responsible Medicine (PCRM) in regard to CalEPA's proposed large scale chemical testing on animals. In a progressive state such as California, I'm surprised that this type of outdated horrific research continues to be done, especially knowing that there are more efficient, humane, & appropriate technologies available. We absolutely cannot say we're an advanced society by continuing to inflict cruelty on our fellow mammals and it's time to stop all animal testing. I say, "hands off the animals" and adhere to the National Academy of Science recommendations for tissue cultures, etc. Please, please work with PCRM!
F-TD-76	ALL Forms of ANIMAL TESTING are CRUEL and INHUMANE. Not to mention INCONCLUSIVE. There are OTHER Alternatives to Animal Testing. PLEASE USE THEM So MORE Animals DONT Have to SUFFER NEEDLESSLY and HORRIBLY !

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-77	Rutgers University purchases thousands of chemicals and products for use in hundreds of buildings throughout our three campuses. We have implemented comprehensive acquisition processes to assure that the products we purchase are manufactured and distributed in compliance with all applicable laws and Rutgers standards. In the past six months, I have become aware of the Web-based "Green" Product Compliance Analytical System (GP-CAS) and the "Green" Process Analytical Compliance System (G-PACS) developed by Chemical Compliance Systems, Inc. (CCS). These two, quantitative, Web-based systems have been incorporated into a third party cleaning product certification program by the Chlorine Free Products Association (CFPA). Together, GP-CAS and G-PACS evaluate the entire life cycle of a product. Rutgers University is currently in discussions with CFPA and CCS about the possibility of incorporating these capabilities into our chemical and product acquisition processes. California may find these existing Web-based capabilities applicable to the objectives of your Green Chemistry Initiative. They certainly have the potential to achieve a voluntary product certification program that could increase the application of available chemical hazard information in a way that reduces labor and cost requirements for both the State and industry, while increasing the protection of the public and the environment.
F-TD-78	<ul style="list-style-type: none"> • A recent report by the National Academy of Sciences, entitled "Toxicity Testing in the Twenty-First Century: A Vision and a Strategy," recommends an overhaul in the way chemicals are tested for toxicity. California's implementation of green chemistry goals should be consistent with this vision, and the state should commit resources to this effort. • Animal-based toxicity testing methods are dismally inaccurate, and they result in the painful deaths of hundreds or thousands of animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these outdated testing methods. • Thousands of chemicals have already been tested in other government programs, and existing data must be gathered, fully evaluated, and used prior to initiating further testing requirements.
F-TD-79	I am really for the enviroment and reducing my own carbon footprint as well as spreading awareness throughout my own community as to what anyone can do to be more enviromentally friendly. However I am not for cruelty to animals. Animal testing is barbaric, innacurate and unethical. I will not support YOUR organization if you support animal testing, plain and simple.
F-TD-80	<p>Since I was a child, I have been active in trying to put an end to animal testing. As an adult, I know that animal testing can be avoided if those doing the testing put their minds to finding a better, non cruel method for producing test results.</p> <p>As a culture, we haven't evolved very much if we are still killing animals in the name of science for the fifty years that I have been alive. Come on= put your energy into finding other ways to test your toxic products. Don't kill defenseless animals in the name of science. It's cruel, inhumane, and not a reliable gage for testing results on humans.</p> <p>Find another way!!! I challenge you!</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-81	<p>I want to join the voices urging green chemistry policies that do not involve using animals for testing, and are enacted quickly, as we are out of time. PCRM has said it best, so I will quote them below:</p> <p>Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California’s implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p> <p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p>
F-TD-82	<p>Serious environmental scientists know that it's not ethical, appropriate, or feasible to subject every chemical to animal tests.</p> <p>Animal tests do not protect human health and can use hundreds and even thousands of animals per chemical. To test on animals to simply make health claims for humans is not only unreasonable, it's unethical and very unnecessary. If this is what science has been reduced to, testing on animals to make health claims for humans, I think that science is the most pathetic and unevolved process that we have. It's a complete embarrassing joke. However, there are alternatives. Please take human cell and tissue methods, computer based methods and tiered testing schemes into consideration. If we have spent all this time to create and produce such methods that are notably more accurate than animal testing, and we do not use them, then what is the point. We already know what the majority of chemicals do to our bodies and the environment, why waste money, time, an innocent lives by conducting archaic animal tests. Please reconsider, science reputation and the lives of millions of animals count on it!</p>
F-TD-83	<p>The people that test on animals clearly have conduct disorder...how can you hurt these harmless animals...you are sick and disgusting! I don't know how you sleep at night but all I do know is after you kill these animals they go to heaven where they stop suffering...and when you die you will rot in hell suffering from the same experiments that you did to them..You are sick people and you will get what comes to you.</p>
F-TD-84	<p>As a taxpayer of California I am concerned about wasteful spending in our state government. I find that nothing wastes our time and money more than animal research. It's a gravy train for most scientists since most research is funded in huge part by the pharmaceutical industry. 98% of all animal tests fail and cannot be applied to humans according to the FDA's own statistic! The latest Vioxx scandal is just the tip of the iceberg. Yet a lot of scientists keep using this outdated model because the FDA and NIH are slow-moving bureaucrats that are not prone to quick change. And a lot of companies are not interested in change since they make money off animal research. Bad habits are hard to break, yet there's hope on the horizon. There are new and more accurate testing methods that do not involve animals and are safer for us, safer for the environment and simply superior to the animal model. Even the NRC (National Research Council) found that current animal toxicity tests are time-consuming, expensive, unreliable in predicting human toxicity and concludes that animal testing should be greatly reduced and possibly eliminated.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>I opt for cellular-based methods that are cheaper, faster and easier to use. In vitro tests can be automated to evaluate thousands of chemicals over a wide range and are able to identify the chemical's action on cell and gene function plus mode of action of toxicity. There are new and exiting technologies that use high-throughput cellular assays, microfluidics and computer models, all without using lab animals.</p> <p>I urge you not to go down the old road of costly wasteful animal testing but embrace the new and better research models. If not now, when? California is so much the frontrunner in so many ways, we should not be the rearguard when it comes to animal tests. Let these crude tests finally be a way of the past, not only for the animals' sake but for our sake.</p> <p>I also urge you to use existing data and not double-test what is already known to be toxic.</p>
F-TD-85	<p>Animal testing is dangerous because it has led to important errors when applied to humans. It is also an indication that a society still has much to grow in terms of morality and ethics.</p>
F-TD-86	<p>Please consider NOT testing on animals! Animal testing is cruel and useless. It does not give accurate results, as far as people go! If you want to be GREEN, respect all life -- including animals!</p> <p>Thank you for your time! PS: For more information, visit www.stopanimaltests.com!</p>
F-TD-87	<p>PLEASE DON'T TEST ON ANIMALS! Visit www.stopanimaltests.com for videos, photos, stories and what you can do to help animals in labs!</p>
F-TD-88	<p>Animal testing is sick, sad and sadistic... There are new advances in technology! We don't need to test on animals! That's a thing of the past. Please consider doing tests on computers --- not animals! Animals want to live free and happily; not be tested on in some dark, scary lab!</p>
F-TD-89	<p>Dear Sirs, Please protect the earth! Do what is best for Mother Nature and all her wonderful creations! We've got one planet and one change --- don't mess it up! Thank you for the time, Niki</p>
F-TD-90	<p>Animal-based toxicity testing methods are dismally inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p>
F-TD-91	<p>Any good environmentalist knows that there is a balance within the environment and that balance includes animals. The use of animals in testing only helps to further corrupt our environment by taking away these creatures from either their natural habitats or helping to further the industries that breed animals so that the only future they have is loveless, cruel and painful lives. Humans are also animals and this planet belongs to us all, we have no right to say that furthering our existence is more important than letting the other earthlings that we share this planet with leading their lives as they were meant to be. Afterall, it is us as humankind that have lead to the slow deterioration of our home and innocent animals should not be left to foot the bill for it.</p>
F-TD-92	<p>As a native of California, I care deeply about the environment; I also care about animals in laboratories. CalEPA does not need animal testing to achieve its goals. On the issue of toxic animal testing (or any type of animal testing), I am in complete agreement with the position of the highly respected organization Physicians Committee for Responsible Medicine. NO ANIMAL TESTING!</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-93	Aside from being cruel, testing on animals is useless because it is not scientifically valid. If the animal gets sick/dies it is not necessarily true that a human will get sick/die from the same substance. If an animal does not get sick/die, it is not necessarily true that a human will not get sick/die from the same substance. Hence, the tests on animals do not guarantee safety for humans.
F-TD-94	We don't experiment on demented humans so how can we rationalize experimenting on animals? Non-human animals and human animals differ only in the quantity of their expression of certain characteristics not in the characteristics themselves. Non-humans have their own interests, they are capable of feeling pain and we should therefore extend moral significance to them. Speciesism is no different from racism and sexism. I believe we're ready to move beyond speciesism by stopping the use and abuse of nonhuman animals for our own pleasure and convenience. I don't believe any experimentation on animals should be done. But, in the event that some great benefit could accrue from such experimentation, the burden should be on the shoulders of the experimenter to prove without a doubt that this is so and that no other alternative would be acceptable. Again, there is no basis for setting non-human animals apart from our moral community. If we put our energies towards change, I'm certain we can discover many great alternatives to animal testing.
F-TD-95	There are other ways you can run tests. There are clones made from human cells and tissues that you can use, and also computer models of the human body. These human models are much more accurate than a rabbit or mouse. Please don't subject an innocent animal to unnecessary pain and suffering just for our benefit. Most people would never want an animal to suffer. The only reason most people are ok with these tests are because they are behind closed doors where you don't have to see them or think about them. If you saw the horrific things they did to these poor animals, I know you would try to stop it. Please think of the other methods that are available to run your tests. Thank you.
F-TD-96	Moving away from the use of animals in testing is a no-brainer. It's been demonstrated time and time again that data from animal subjects can't be trusted to extrapolate to humans. We should be researching and developing human-focused testing methods such as cell and tissue assays, which have proven to be more reliable than animal-based research. Moreover, we can take advantage of existing data gathered from other testing programs, preventing costly and needless suffering for animals.
F-TD-97	The scientific community has access to hypersophisticated technology so advanced that it makes animal testing seem even more archaic, barbaric and Draconian that it actually is. Isn't it about time that this technology is implemented to its fullest capacity, to save lives, both human and animal?
F-TD-98	Please use better testing methods that do not include harming other living creatures. Animal testing is not always a good predictor of how things will affect human beings anyway. Use the cell and tissue assay testing that has been developed to research the effects of toxins in the environment. This will give you the results you need and no living creature will need to be harmed in the supposed "name of science"!!!!!!
F-TD-99	...and the proposed large-scale toxicity testing initiatives aren't them. Let's not reinvent the wheel and cause undue animal suffering (and expense!), only to find in the end that the results have little bearing on humans. Why not commit funding and resources to the effort already initiated by The National Academy of Sciences? Not to do so would be wasteful in so many ways.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-100	<p>Animal-based toxicity testing methods are dismally inaccurate, and they result in the painful deaths of hundreds or thousands of animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these outdated testing methods. Thousands of chemicals have already been tested in other government programs, and existing data must be gathered, fully evaluated, and used prior to initiating further testing requirements.</p> <p>I feel that it's not ethical, appropriate, or feasible to subject every chemical to a fixed list of animal tests. Animal tests do not protect human health and can use hundreds and even thousands of animals per chemical. In order to get a handle on toxic chemicals in our environment, California should develop and use cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods, and intelligent, tiered testing schemes—not cruel and archaic animal methods.</p> <p>A recent report by the National Academy of Sciences, entitled "Toxicity Testing in the Twenty-First Century: A Vision and a Strategy," recommends an overhaul in the way chemicals are tested for toxicity. California's implementation of green chemistry goals should be consistent with this vision, and the state should commit resources to this effort.</p>
F-TD-101	<p>There are human cell and tissue methods, computer-based methods, and intelligent, tiered testing schemes. Why hurt creatures of our environment? A Green Program should be friendly to all of the environment including all its animals!</p>
F-TD-102	<p>Protect the Environment Accurately!!</p> <p>Hi. We all want to protect the environment, but animal testing should play no part in that protection. That's because animal-based toxicity testing methods are inaccurate. Should we subject hundreds to thousands of animals--per chemical--to sometimes painful and always needless deaths? California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. More accurate methods must be employed.</p>
F-TD-103	<p>Stop Cruel and Useless Animal Testing!!!</p> <p>Please stop testing on animals. It's cruel, unnecessary, outdated, and ultimately archaic.</p> <p>Serious environmental scientists know that it's not ethical, appropriate, or feasible to subject every chemical to a fixed list of animal tests. Animal tests do not protect human health and can use hundreds and even thousands of animals per chemical. In order to get a handle on toxic chemicals in our environment, California should develop and use cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods, and intelligent, tiered testing schemes—not cruel and archaic animal methods.</p> <p>Don't believe me? Read this cold hard facts!:</p> <p>>A recent report by the National Academy of Sciences, entitled "Toxicity Testing in the Twenty-First Century: A Vision and a Strategy," recommends an overhaul in the way chemicals are tested for toxicity. California's implementation of green chemistry goals should be consistent with this vision, and the state should commit resources to this effort.</p> <p>>Animal-based toxicity testing methods are dismally inaccurate, and they result in the painful deaths of hundreds or thousands of animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these outdated testing methods.</p>
F-TD-104	<p>Animal testing is disgusting STOP ANIMAL TESTING NOW! We Californians are better than that</p>
F-TD-105	<p>Animals Have Nervous Systems Just Like You How could you sleep at night while animals would scream with pains you would cause? BE HUMANE!</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-106	<p>I love animals but not to the exclusion of humans -- the results of testing on animals don't necessarily prove what the results would be on humans. Spare the animals unnecessary testing and test only where results would be accurate for humans -- on human</p> <p>As a citizen of California who cares about the environment and animals in laboratories, I am concerned about CalEPA being involved in animal testing. The following points brought to my attention in an e-mail from the PCRMC should be heeded by CalEPA:</p> <p>Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input.</p> <p>We need to get a handle on the toxic chemicals in our environment quickly — that means developing and using cost - and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes.</p> <p>California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p> <p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p> <p>Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies.</p> <p>Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p> <p>Thank you for your consideration.</p>
F-TD-107	<p>The planet will die (& us with it) unless we change to green ways</p> <p>Protecting the environment is in the interest of every Californian (and human), and any programs or processes should be open and transparent with an opportunity for public input.</p> <p>We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes.</p> <p>California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p> <p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p> <p>Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies.</p> <p>Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p> <p>Likewise, somewhere in there should be the dire need for conservation. Grass is a ridiculous waste of future generations' water supply and it adds carbon with the power mowers, etc. Cutting back on wasteful practices also reduces the toxins released into the air, soil and water.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-108	Animal Toxicity testing does not extrapolate to humans; it wastes our precious taxpayer dollars!!! I am a native Californian and I have a right to comment on and have input on any programs or processes that affect my health and the environment. I support quick results and that means developing and using cost and time efficient high through-put human cell and tissue methods, computer-based methods like (Q) SAR and intelligent tiered testing plans. "Green Chemistry" goals should be achieved by following the lead of scientists who advocate 21st Century Toxicity Testing of the National Academy of Sciences and by committing funding and resources to achieve this effort and ensuring that any Green Chemistry initiatives related to tox testing take this groundbreaking report into account. Animal based tox testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of tox tests for all chemicals is wasteful and unscientific. As a taxpayer, I am very tired of paying for animal based studies that can not be extrapolated to humans and that doing so can even cause harm to humans. Let's not repeat tox testing that has already been done, just to justify salaries. We already have a budget deficit for next year---let's not waste millions more taxdollars on "old" science that is already proven ineffective and wasteful. California is a proven trendsetter; let's keep it that way in this arena too!
F-TD-109	Animal testing cannot be the only option. Don't do it. Let's do it right by using any other available alternative. Ilaria
F-TD-110	No Animal Testing! There is no need to do animal testing for this. There are many other alternatives to get the data and conclusions that you need. Also, why waste all the money on suffering? Please do not test on animals.
F-TD-111	Animals should never be used for this horrific inhumane testing. We should set the precedent by not being barbaric like China and other asian countries that cruelly treats their animals. Please do not use animals for any testing.
F-TD-112	The traditional approach to gauging the potentially harmful effects of chemicals on humans has been to expose animals to the chemicals and look for overt signs of toxicity, such as death. Chemical toxicity should be assessed using a sophisticated array of non-animal approaches which can be done. This would completely eliminate the use of animal-based testing. Humanely all animals need to be eliminated from any kind of testing.
F-TD-113	Animal testing ? It is cruel and unnecessary to experiment on animals please rethink your strategy on testing methods.
F-TD-114	Animal tests are cruel and useless First, let's establish a few things here. * Animal testing is cruel and unethical. Period. In no way, shape or form do you even have the right to kill thousands of animals, especially when easy alternatives exist. * Animal testing is useless. First, for the obvious SPECIES DIFFERENCE. Animals bodies are not like ours, and the outcome you get from an experiment may end up harming humans. If you want to protect your California residents, use alternatives designed for humans, that will render the right results. In conclusion, the fine people who have posted above share my reasoning; we simply don't want pig-headed, ignorant people slaughtering thousands of animals in the sake of "science".
F-TD-115	end to cruel and painful treatment of animals Please help this country stop any and all animal testing and the pain and cruelty that is a result of it. Please set up standards for testing, research, development based on means such as human focused cell and tissue assays. Thank you.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-116	<p>Californians want their state to be forward-thinking. And that includes moving away from out-dated methods of testing chemicals. Please take into account the report from the National Academy of Sciences, "Toxicity Testing in the Twenty-First Century." If the National Academy of Sciences is calling for a re-tooling of the way toxicity is researched, shouldn't California be taking heed of this, and leading the way towards this goal? Please also take into account the many chemicals that have already been tested; it is a waste of time, money, and animal lives to compile redundant research on these.</p> <p>I'm proud of California for leading the way on so many environmental issues; let's stay cutting-edge on the issue of moving towards modern research methods, too. Please use only tissue and cell assays for whatever testing is necessary.</p>
F-TD-117	<p>Stop animal research... Cruel AND inaccurate! I cannot believe in our world today that you would still use animals to test upon when we have computer and cell culture technology! The use of animals is so cruel, redundant, as well as, so inaccurate! Get with the times!!!</p>
F-TD-118	<p>Animal testing is cruel and inhumane. We live in an advanced society where other methods can be used. If scientists continue using animals in these horrific experiments that are unfounded and useless, they are nothing more than barbaric beings of another kind.</p>
F-TD-119	<p>ANIMAL TESTS INHUMANE UNETHICAL AND NOT APPLICABLE TO HUMANS It is bizarre that we this we must torture and kill others to make products safe for humans. In rality, the torture and killing is a given in these procedures but the benefits are simply not there - many animal tests have resulted in a false sense of safety in the past. THIS IS WRONG AND WASTEFUL. PLEASE STOP!</p>
F-TD-120	<p>No Animal Testing! Animal testing is ineffective and cruel. It's not necessary. Changing what's being allowed and cleaning up what has occurred will work. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. This is a critical decision. The end does not justify the means. We'll never get where we want to go by unnecessarily slaughtering animals. Thank you for your consideration.</p>
F-TD-121	<p>Protect Humans, but Use Tests that Work and Don't Harm Animals I want to be protected from toxic chemicals as much as anyone, but let's use methods that work. I understand the Physicians' Committee for Responsible Medicine is more than willing to assist you in developing methods for testing toxicity that are more accurate than outdated animal tests. Animal tests are torture and there is enough data showing that they often do not apply to humans. Let's use more cost and time efficient methods such as high-throughput human cell and tissue methods, computer-based methods and intelligent, tiered testing schemes. Thank you.</p>
F-TD-122	<p>Pain and suffering cannot be justified There is no justification for the use of animals for this testing. I will not vote for anyone who supports this initiative. Animals deserve our protection .</p>
F-TD-123	<p>LEAVE ANIMALS ALONE!</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-124	<p>Painful Test to Animals Under the guise of "helping" humans we resort to painful, debilitating experiments on live animals which have uncertain, sometimes useless or undeterminate results. There are other ways to test the chemical's effects, which I am sure intelligent scientists that you are -can utilize. Testing put forth by the National Academy of Science that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. Another way -is to do the chemical tests on yourselves and get the results first hand Ed K</p>
F-TD-125	<p>Animal Testing Please do not continue with animal testing as it is not accurate. Going green is great but life is what you are trying to save so destroying it in the process is unthinkable. Thank you for listening and hopefully knowing what is right and helping the defenseless.</p>
F-TD-126	<p>No animal testing please, its not nessiscary completly unnessiscary.</p>
F-TD-127	<p>why animals who gives humans the write to torture our fellows animals for our own benefit? I certainly do not support this cruelty. Animals are living with us and are part of the world as we are. I respect every living thing and try my best to respect that in my everyday life and this is also why I am a vegetarian. can somebody explain me why is it acceptable to torture innocents creatures and why society accept proven murderers in jails and I pay with my taxes their food and habitat. What is wrong with that picture?</p>
F-TD-128	<p>Animal-based toxicity testing methods are CRUEL & INACCURATE Sir: Animal-based toxicity testing methods are dismally inaccurate, and they result in the painful deaths of hundreds or thousands of animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these outdated testing methods. Thousands of chemicals have already been tested in other government programs, and existing data must be gathered, fully evaluated, and used prior to initiating further testing requirements. I feel that it's not ethical, appropriate, or feasible to subject every chemical to a fixed list of animal tests. Animal tests do not protect human health and can use hundreds and even thousands of animals per chemical. In order to get a handle on toxic chemicals in our environment, California should develop and use cost- and time-efficient high-through put human cell and tissue methods, computer-based methods, and intelligent, tiered testing schemes—not cruel and archaic animal methods. A recent report by the National Academy of Sciences, entitled "Toxicity Testing in the Twenty-First Century: A Vision and a Strategy," recommends an overhaul in the way chemicals are tested for toxicity. California's implementation of green chemistry goals should be consistent with this vision, and the state should commit resources to this effort</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-129	<p>End Useless Animal Testing</p> <p>California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p> <p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p> <p>Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies.</p> <p>Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific</p>
F-TD-130	<p>Don't listen to human-hating animal rights nuts</p> <p>Look -- There are two sides to this debate. You can be a realist and recognize that in order for humans to thrive, some animals must be sacrificed. Or you can be an intellectually incomplete bunny hugger and prefer to save lab rats over your neighbors, relatives, and friends. It's that simple. And tell the Physicians Committee for Responsible Medicine to mind its own business and admit that only 4 percent of its members are doctors. I would rather have science policy in California dictated by 100 random names from the San Francisco phone book, rather than these single-issue nut cases.</p>
F-TD-131	<p>GW not an excuse to waste \$\$ or lives</p> <p>Please don't use the miniscule degree of natural warming as an excuse to torture animals with archaic toxicity testing. There's going to be huge amounts of money spent on this scam, but don't pay for it with innocent lives of animals. Most testing done would be redundant anyway. Be fiscally responsible and use human based testing methods, which are much more accurate.</p>
F-TD-132	<p>Stop Toxicity Tests on Animals</p> <p>Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input.</p> <p>We need to get a handle on the toxic chemicals in our environment quickly, that means developing and using cost, and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes.</p> <p>California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p> <p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p> <p>Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies.</p> <p>Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p> <p>Thank you for considering my comments.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-133	<p>Mr</p> <p>I feel that it's not ethical, appropriate, or feasible to subject every chemical to a fixed list of animal tests. Animal tests do not protect human health and can use hundreds and even thousands of animals per chemical. In order to get a handle on toxic chemicals in our environment, California should develop and use cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods, and intelligent, tiered testing schemes—not cruel and archaic animal methods.</p> <p>A recent report by the National Academy of Sciences, entitled "Toxicity Testing in the Twenty-First Century: A Vision and a Strategy," recommends an overhaul in the way chemicals are tested for toxicity. California's implementation of green chemistry goals should be consistent with this vision, and the state should commit resources to this effort.</p> <p>Animal-based toxicity testing methods are dismally inaccurate, and they result in the painful deaths of hundreds or thousands of animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these outdated testing methods.</p> <p>Thousands of chemicals have already been tested in other government programs, and existing data must be gathered, fully evaluated, and used prior to initiating further testing requirements.</p>
F-TD-134	<p>ms</p> <p>please stop any and all animal testing. Can you not create a scientific environment that is both safe for animals and humans and where you can perform your testings.</p> <p>Whenever I read where there is unwarranted animal testing is being practiced, it reminds me of the experiments the Nazis did in concentration camps. I have no doubt that if these scientists today could experiment on humans to get the most accurate data, they would.</p>
F-TD-135	<p>Animal torture is scientifically useless</p> <p>Animal testing results are routinely disregarded or disputed by the scientific community, government AND chemical companies anyway, so why do they keep doing them? Let's stop it, already! There are plenty of accurate, humane methods for testing chemicals (human cell tests...). Do not sponsor animal cruelty under the guise of helping/protecting people.</p>
F-TD-136	<p>Their physiology is slightly different from ours, as their systems are adapted to consume things we can not and vice versa, so the testing would undoubtedly be inaccurate. Even if I still ate animal anymore, I'd have to cook the creatures the Empress Panthera caught before I could consider eating them, but her idea of fine dining is freshly captured and played to death. If you must test, insist upon using the CEO of the company.</p>
F-TD-137	<p>Let's get past medieval methods for toxicity testing</p> <p>California's Green Chemistry goals are laudible, and should not be sullied by use of cruel and inaccurate animal testing methods. Modern, humane, and more accurate methods should be used instead, and should follow the recommendations of the National Academy of Science's "Toxicity Testing in the Twenty-First Century" report. Most Californians favor protection of the environment, and we also deserve a say in how this is accomplished and who (or what) is hurt along the way, so please allow for public input to decisions on methods to accomplish toxic chemical testing.</p> <p>Thank you</p>
F-TD-138	<p>no animals tests, please</p> <p>I respectfully encourage the state of California, which I am a resident of, not to subject hundreds or even thousands of animals to tests involving chemicals. There are a few reasons. First, many of these tests may have already been conducted by other government agencies, so the data is available already. Second, what we learn from these tests on animals do not translate to humans. Third, computer programs are available now that make animal testing obsolete. Thank you.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-139	<p>No Animal Tests Please make Green testing animal friendly testing too. Human-focused tests are not only more humane, but also more reliable. For good science, and good ethics, create a policy that does not include animal tests. Animal-based toxicity testing methods are dismally inaccurate, and they result in the painful deaths of hundreds or thousands of animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these outdated testing methods.</p>
F-TD-140	<p>Where do you draw the line? Animal testing? Come on, in case pharmaceutical and chemical companies didn't noticed, we are in the 21st century! Hello! First of all, we don't need more chemicals. Second, before we create more harmful products, we should figure out what to do with the mess that we created, that ends up in our water, our rivers, our lakes, our oceans and ultimately in our faucets (that's where people start to care). But that is another topic. But if we must continuously produce more and more (compliment of our capitalist world), then don't drag innocent animals in this ugly business, inflicting them unthinkable torture. If half of what is done to mice, rabbits, monkeys and who knows what other animals was done to dogs or cats, people would sue the companies for felony. Same goes for animal farming, but that is yet another hot topic that requires immediate action. What can companies do then? Get a handle on the toxic chemicals in our environment by developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. That would be a great place to start.</p>
F-TD-141	<p>Animal tests are CRUEL and INACCURATE for HUMANS I was outraged to hear that CA - one of the most progressive states in our nation - is passing off cruel animal testing as part of a "GREEN" initiative. Living green is a life philosophy that includes humane treatment of all beings. As a resident of CA, I am extremely disappointed that you would sell this initiative to the public as Green when you plan to conduct inhumane animal tests. Yes, we need to understand the toxic chemicals in our environment quickly—but it should be done using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p>
F-TD-142	<p>The preservation of our environment should go hand in hand with the preservation of life, not one for the other, otherwise it will ultimately defeat its purpose. There is no point in working to preserve our environment while condoning violence because it will all still lead to our own demise.</p>
F-TD-143	<p>Animal testing cannot be extrapolated to Homo Sapiens! As a citizen of California who cares about the environment and animals in laboratories, CalEPA needs to hear from you! You may want to include the following points: Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p>
F-TD-144	<p>The Importance Of Life Protecting the environment should be in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input, as a democracy, people today should have a say on what decisions are being made! Another important topic we have to face whether we like it or not is that we need to get a handle on the toxic chemicals in our environment quickly—without further delay which means that life does not have to be sacrificed for science. There are many equally valuable alternatives such as developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific</p>
F-TD-145	<p>Stop useless animal testing As a citizen of California who cares about the environment and animals in laboratories, please develop and use cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p>
F-TD-146	<p>ANIMAL TESTING DOES NOT WORK !! Why doesn't the scientific community admit to the fact that it has been proven a multitude of times, that the results derived from testing on animals do not correlate to the results of testing on humans. There are also many test materials that can be used instead of animals and with far more accuracy and far less cost. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account</p>
F-TD-147	<p>Violence toward animals boomerangs as disease in humans When we sow seeds of inflicting disease on otherwise healthy animals, we reap disease in ourselves - it's unavoidable. Very stupid, except for those making big bucks from animal and human misery and suffering.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-148	Animal Testing is NOT Necessary in this Day and Age Some sicko must have thought up this one. I do believe that the people that think up animal tests are enjoying torturing them and this is an excuse. It certainly is not a necessity in this day and age. Please do not allow them to stoop to this low level.
F-TD-149	Animal tests are misleading and are torture Scientists do not gain valid information about the toxicity of a substance by giving an animal one times the dose a human would get and "testing" the result. A civilized and compassionate nation does not allow its people or its animals to be tortured.
F-TD-150	Testing on animals is not only cruel, it's dangerous. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.
F-TD-151	Is this 2007? You would think that it would not be necessary to torture animals with the technology we have now.
F-TD-152	mr. Please stop all tests on animals. It is unnecessary.
F-TD-153	Please don't use animals, I've heard them cry! If you've ever been to animal testing facility, you wouldn't been able to sleep for the rest of your life. I've heard rabbits scream and dogs cry, please, don't test on animals. We live in 21 century and have better ways to test without killing innocent helpless animals jailed in their cages for torture.
F-TD-154	anti-animal testing reason Animal testing is no longer necessary because chemicals always react differently in different animals than in humans! This means that a product might be safe for an animal but dangerous to us humans!
F-TD-155	Therefore, the animal-testers could test the products on themselves in order to determine whether or not the animal-tested products are safe!
F-TD-156	Why would any agency consider animal testing? It's hard to believe that inhumane animal testing is still being considered by any agency or lab, after so many results from it have proved unreliable and/or useless. It's time to stop this terrible cruelty and begin to obtain better results from better lab tests.
F-TD-157	animal testing? are you kidding me? seriously now, theres no need

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-158	<p>No More Animal Testing I'm asking CalEPA to stop using animal testing. I do not support it and do not want my tax dollars supporting animal suffering. Please put funding toward R&D of cost- and time-efficient human-focused testing methods such as cell and tissue assays and computer-based methods such as (Q)SAR. Also, please refer to the groundbreaking report put forth by the Nat'l Academy of Science and take advantage of existing data. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific. Animal tests are barbaric. The cruelty and suffering it inflicts on animals is unethical and unacceptable. This is 2007. With today's technology we'd all be better off using advanced testing methods, not crude animal testing. Thank you. Sincerely, CF</p>
F-TD-159	<p>Useless, outdated information. Testing on animals is outdated science! Its expensive, ineffective, and a waste of time, not to mention CRUEL. They feel pain exactly like we do, only they can't scream. Instead, use other methods of testing, computer based tests or tests involving human cells & tissue. STOP THE MASSACRE.</p>
F-TD-160	<p>Vioxx legacy Merck has agreed to pay \$4.85 billion to settle 45,000 lawsuits by people who claim they or their family members suffered injury or died after taking Vioxx. Vioxx was tested on animals and presumed to be safe, but obviously animal testing is a poor substitute for human cell and tissue methods. From now on, the "knew or should have known" standard will be applied to medical research, both private and public. Who wants to be associated with another Vioxx scandal? We need to move forward with more meaningful research that yields results humans can count on.</p>
F-TD-161	<p>NO MORE EXCUSES FOR BAD SCIENCE AND TAKING OF LIVES Every time toxicity tests for human-use products are done using members of other species, they certainly show the effects on those members of other species; they do NOT show any valid results on humans, and are nothing but a senseless waste of time, money, and precious lives, and therefore unconscionable. Modern methods such as tissue assays, cell cultures, and computer modeling have existed for some time, and they are far better models than members of other species for testing human-use products; moreover, they do not result in senseless suffering, the taking of lives, or the waste of yet more of our taxpayer dollars. It is way past time to stop this antiquated and barbaric practice and use modern methods.</p>
F-TD-162	<p>animal testing IT IS SO VERY IMPORTANT THAT WE CONTINUE TO RESEARCH AND DEVELOP HUMAN-FOCUSED TESTING METHODS IN PLACE OF THE BARBARIC DESCARTESIAN METHODS WE HAVE IN PLACE TODAY. WHAT A TERRIBLE LEGACY DESCARTES LEFT US. LET'S MOVE BEYOND THE ANIMALS' INQUISITION, THE ANIMALS' AUSCHWITZ. THE ANIMALS ARE INNOCENT, AND HAVE DONE NOTHING TO DESERVE THIS CRUEL AND INHUMANE SENTENCE INTO INFINITY! WILL CAL EPA MOVE INTO THE 21ST CENTURY, OR WILL IT, ALONG WITH THE OTHER INSTITUTIONS THAT TORTURE ANIMALS, REMAIN FOREVER IN THE DARK AGES? CAL EPA - DO YOU HEAR THE ANIMALS' SCREAMS OF PAIN? HAVE YOU SEEN THE UNDERCOVER VIDEOS OF THE SAD, PATHETIC, AND TORMENTED ANIMALS IN THE ANIMAL RESEARCH LABS? PEOPLE LAUGHING AND JOKING, MUSIC PLAYING IN THE BACKGROUND, WHILE ANIMALS ARE SUBJECTED TO UNSPEAKABLE PAIN AND SUFFERING? WHILE THE ANIMALS ARE DRIVEN INSANE? I HOPE WITH ALL MY HEART AND SOUL, THAT SUCH HEARTBREAKING ATROCITIES WILL SOON BE A THING OF THE PAST. AND I WILL CONTINUE TO SPEAK OUT, AGAIN AND AGAIN, WITH ALL MY HEART AND SOUL, AND FIGHT AGAINST THESE TERRIBLE INJUSTICES WHEREVER I FIND THEM.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-163	END ANIMAL TESTING There is no need to test on animals in this day and age. It is cruel, ineffective and inhumane, and you know it!! You need to end it!!
F-TD-164	Stop Useless Animal Testing Please stop all inhumane and useless animal testing. Just because something works on a mouse, doesn't mean it will do the same on a human; because something is not toxic to a guinea pig, doesn't mean it will not poison a human. Surely, computer modeling and other methods can give better an more accurate results
F-TD-165	No more animal tests animal testing is unnecessarily cruel. Enforce other options instead of cruel ones.
F-TD-166	saving lives both animal and human a like by wathcing - www.suprememastertv.com - i've evolved and learned that animals are our co-inhabitants. and we should treat them with dignity and respect. Please, lets spare our loving friends and use technology instead of torture
F-TD-167	Come out of the Dark Ages--stop animal testing. Come out of the Dark Ages--stop animal testing. How often must we say this??
F-TD-168	Mr. Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific
F-TD-169	If you wouldn't test it on your child, don't test it on an animal Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	As Californians, we must lead the world in rational and humane practices. Thank you.
F-TD-170	Animal Tests Are Ineffective It has been proven repeatedly that information from animals does not extrapolate to humans. Animal testing is archaic, unscientific and barbaric. If CalEPA cares about protecting us stop the farce of animal testing and start utilizing methods that actually give sound data
F-TD-171	The difference between a baby and an animal = nothing Well Would ya ever think that human are the most well placed to be tester instead of poor animal without any defense... D'ya think I am NOT right to think about it??? Well, YOU'LL surely think about that the next time a rat or a puppy please you to stop these filths... Think one more thing : THEY SUFFER, RIGHT????
F-TD-172	Animals feel pain just as people do only they do not have a voice I live in CA and I am disgusted that animals will be used for this test. How does that make this world a better place? Animals are not substitutes for humans. If there are toxins that is self explanatory and toxin usually means poison. One does not need to test them on animals to find that out. If we all pitched in and recycled, the earth would be cleaner without torturing innocent animals. Education is where the dollars should go and where the data should be collected. Teach students about repairing the environment along with the value of life for all animals. Children today lack empathy and this is a way to improve the environment while teaching empathy for all living things.
F-TD-173	Tell CalEPA to Stop Toxicity Tests on Animals and Use Instead Sound Alternative Methods As a citizen of California who cares about the environment and animals in laboratories, I urge you to develop green chemistry policies and regulations, including developing and using cost- and time-effective testing methods. Alternatives to animal testing should be used, including (but not limited to) human cell and tissue methods, computer-based methods, and tiered testing schemes. These green chemistry goals should align with the vision for 21st-Century Toxicity Testing as articulated by the National Academy of Science.
F-TD-174	It is time to stop testing on animals and use other methods that have proven to be more accurate, such as tissue methods and human cell testing. Please do your part to save animals from torture and death for unnecessary testing. Thank you.
F-TD-175	Please Stop! Please stop testing on animals! It is not only cruel and inhumane, but unreliable and unneeded.
F-TD-176	Do not use animals for testing Animal-based toxicity testing is barbaric. We are better than that. Please stop this. November 9, 2007 Scott Hurlbert To test on the little creatures that God gave us to take care of is truly barbaric!
F-TD-177	To test on the little creatures that God gave us to take care of is truly barbaric!
F-TD-178	Animal Testing is Unreliable I only want human-focused testing methods such as cell and tissue assays to be used in developing green chemistry technologies. Animal-based testing methods are not only inaccurate, but result in painful deaths to innocent animals.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-179	<p>Testing on Animals Some businesses, agencies etc. have been able to do away with animal testing, still protect the public without diminishing their profits. If some can do so I urge all people to follow suit. As someone once said people, a country, a race can be judged by how they treat their animals.</p>
F-TD-180	<p>Animal Testing ... Are you kidding me? You are asking us for permission to test toxic substances on animals? Well the short answer is NO. There are alternative ways to test chemicals without the loss of life. Please consider them. The PCRM has more information if you are not sure of the alternatives. Keep California residents healthy.</p>
F-TD-181	<p>No need for outdated science There are other more efficient, effective ways to test products besides animal testing. California is a leader in innovation, let's set an example that California will no longer take part in causing animals to suffer needlessly...STOP ANIMAL TESTING!!!</p>
F-TD-182	<p>ANIMAL TESTS ARE CRUEL AND USELESS! PLS STOP! ANIMAL TESTS HAVE BEEN PROVEN INEFFECTIVE WAYS TO HELP HUMANS. THEY ARE CRUEL AND USELESS. OTHER METHODS ARE NOW AVAILABLE THAT ARE MUCH MORE USEFULL TO HUMANS. THESE METHODS SHOULD BE USED AND ANIMAL TESTING STOPPED.</p>
F-TD-183	<p>Do not do Animal Testing! I note the many inputs to you on not using animals in your toxicity testing. I support that request, strongly. In this modern day such methods are not justified, Thanks for paying attention to the citizens of CA. Bill Kleinbauer</p>
F-TD-184	<p>NO ANIMAL TESTING We want our environment to be clean however this will NOT be supported if animals are used. There are other methods to use for testing and on animals is by far NOT one of them!</p>
F-TD-185	<p>Ms. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p>
F-TD-186	<p>No Animal Testing As an educator, I know the importance of protecting our environment, and as a native Californian I appreciate how our state has stringent rules regarding pollution, especially when it comes to protecting humans and other species we coexist with. Regarding the toxic chemicals in our environment, we need to use 21st century methods for testing. Human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes are the responsible and clearly ethical way to go. The National Academy of Sciences has put forth green methods for toxicity testing, and California should take note of this, because animal toxicity testing is not only outdated and cruel, but the results cannot be trusted, which in turn means the citizens of California aren't truly being protected. Lastly, it seems absurd not to use existing data and intelligent testing strategies when determining toxicity. It's high time humans realized that we are intelligent enough to protect ourselves without the need to use and abuse other species.</p>
F-TD-187	<p>Intelligent Humane Testing is the Way to Go Toxicity tests based on animal testing are not the direction we need to go in this day and age. There are other humane, accurate and intelligent data</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	testing methods available. Animal testing is archaic, inhumane and barbaric.
F-TD-188	Please use human-focused testing methods to keeps CA healthy! Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds of animals per chemical. Please use the methods suggested by PCRM to keep California residents healthy.
F-TD-189	Please stop animal testing Serious environmental scientists know that it's not ethical, appropriate, or feasible to subject every chemical to a fixed list of animal tests. Animal tests do not protect human health and can use hundreds and even thousands of animals per chemical. In order to get a handle on toxic chemicals in our environment, You should develop and use cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods, and intelligent, tiered testing schemes—not cruel and archaic animal methods.
F-TD-190	ANY ANIMAL TESTING IS CRUEL..USE ALTERNATIVE METHODS..NO ANIMAL KILLING (TWICE) Animal-based toxicity testing methods are INACCURATE and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California CANNOT ENSURE ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is WASTEFUL and UNSCIENTIFIC
F-TD-191	Abandon animal-based toxicity testing. While it is true that we are all animals,tests using the non-human variety of subjects,as a whole, have little reliability when it comes to relating them to human physiological responses. The tendency to use out-dated testing methods is likely based on a number of factors: habit, laziness, grant funding, unwillingness to search out and employ more effective and humane methods of testing, etc. My state, California, in spite of a general reputation for advancing enlightened pursuits, still utilizes in its institutions and labs cruel, non-productive and wasteful tests, and, where humans are concerned, tests that create misleading results that can pose a dangerous potential for human health. Outdated tests methods will not keep us safe. Humanity, common sense, compassion and ethics, all demand that we abandon animal-based toxicity testing.
F-TD-192	Ms I'm a concerned citizen of California - concerned for the poisoning of our waters and air...and concerned for the wellbeing of animals cruelly and needlessly, repeatedly and wastefully subjected to 'testing'. We know the toxins are virulent. We know that they must be removed. Stop cruel use/misuse of animals and misuse of funds that could contribute -instead of to animal suffering and death- to progress in controlling toxins in our environment. Please follow PCRM's suggestions and guidelines. Thank you, Ruth Feldman
F-TD-193	Abandon Unnecessary and Cruel Animal Testing With new technology we can no longer use animals as our 'guinea pigs' to test on for human purposes. There is no reason to subject animals to toxic and painful tests for the purpose of the betterment of human health. Along with the use of human tissues and cells for experimentation, computer programs can be used to determine needed testing outcomes. Green the testing procedures and leave animals out of the equation.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-194	<p>Stop the Testing on Animals The CalEPA should not only take care of the enviremont but also animals because they live in our enviremont and they are part of it.</p>
F-TD-195	<p>No Animal Testing We MUST stop using animals for testing -- most tests do not equate to human use. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Let us start being humane.</p>
F-TD-196	<p>Please do not allow more animals to be used for needless testing!! This has got to stop!! Animals deserve love, and a warm home, NOT a wire cage with little or no human contact only to be taken out out long enough to be poked and prodded! What an awful life!</p>
F-TD-197	<p>Dow Chemical's Comments on Educational Programs The Dow Chemical Company (Dow) is pleased to provide the attached paper on the role educational programs could play in California's Green Chemistry Initiative (GCI). We have appreciated the open, collaborative environment utilized for this process and have taken advantage of opportunities to participate in a variety of ways. Attached is a brief paper on educational programs where Dow has been engaged with the objective of improving science education and understanding of sustainability. This is intended to catalyze DTSC's thinking about the role education can play and the types of programs to consider. Dow believes that education must play a key role in California's Green Chemistry Initiative for the effort to reach its full potential. on behalf of the Dow Chemical Company</p>
F-TD-198	<p>Step Testing on Animals To Whom It May Concern at the California Environmental Protection Agency: It is unethical and unscientific not to mention downright contradictory to conduct toxicity tests on animals in the name "environmental protection." You should focus your energy on banning the use of the toxic pesticide "methyl iodide" once and for all as the EPA has admitted it can cause thyroid tumors. Period. End of story. No testing on animals whatsoever. Your agency should promote organic products, and land management on a manageable humane scale to humans, the other animals (besides the humans who think they are celestial beings and can do whatever they want to other species) and the environment. And you should focus on developing human-focused testing methods such as cell and tissue assays. It is downright shameful and backwards to continue testing on animals. I hope your agency is making sure to attend all of the Green Festival conferences (www.greenfestivals.org) to continue to grown and advance your knowledge in a positive proactive pro-environmental way rather than to inflict pain and suffering on innocent animals in the name of progress. Sincerely, Adrienne Guy</p>
F-TD-199	<p>sad legacy (TWICE) Testing on animals is unnecessary and inhumane. There are many technological advances that can replace animal testing. I don't want to see any money used for animal vivesection.</p>
F-TD-200	<p>Ms As a biologist and fellow inhabitant of planet earth,I strongly recommend toxicity testing which focuses on human tissue culture techniques-rather than the often inaccurate and always cruel animal tests!!!</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-201	No more animal cruelty with testing Animal cruelty in testing is unnecessary. Just get rid of the toxins. Stop creating toxins. Listen to the ancient cultures still alive today and knowledgeable about plant cures. Western science has lost its way. Find your heart - connect those brains with your soul and heart. NO MORE TESTING ON ANIMALS! They too have heart, soul, a longing for a life of love and care. Ever watch them with their young and mates? NO MORE TESTING ON ANIMALS!
F-TD-202	Please don't test on animals. Please find alternative methods rather than using animals.
F-TD-203	Stop animal testing Please stop all animal testing. It is cruel and not necessary as animals do not give the same results as a human would because their systems and bodies are not like ours. Isn't it time that we decided that we don't need to do tests any longer? We already know what is and is not safe for us, why is it necessary to continue to inflict such hurt and suffering on innocent creatures for our benefit?
F-TD-204	stop testing on animals and use alternative methods Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.
F-TD-205	Please! Be Humane! Can you even begin to imagine what it must be like to be strapped down and injected with who knows what and be in pain and suffering and not be able to move or get away from it? To have something done to you and not be able to escape, the burning, the pain, for days, months or even years? Can we as people think that is even ok to do to any living thing? And then on top of that to cause animal testing when you are trying to save the environment? Do these kind of companies even want to have to do that? Do we want to cause something bad to be done for a good cause? Please don't ask for anything that causes this kind of pain to another living being
F-TD-206	WASTEFUL, CRUEL AND UNETHICAL It is a waste of valuable resources and fraud to expose non human living beings to drugs and chemicals which at best can only produce unreliable data due to incompatibility of species. Furthermore, ignoring all the technological alternatives to animals available for testing drugs and chemicals which are many times more accurate than using other species is immoral, unethical and right out criminal. In fact the only reasonable explanation one can reach from this outrage is that it is done for the sake of scamming large sums of moneys for greedy, scrupless corporations and individuals.
F-TD-207	No more animal testing Please stop the cruel animal testing and test on something that will have results that pertain to humans.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-208	Stop unnecessary & cruel animal testing, NOW! Please listen to the voices of the citizens of California -- we oppose the archaic and unethical testing on animals in the name of environmental welfare. Have a conscience and exercise other options for conducting toxicity testing.
F-TD-209	please stop these cruel experiments on helpless animals.
F-TD-210	Stop Animal testing Animal testing is cruel and will not solve the problem.
F-TD-211	Stop Animal Testing Animal testing is inhumane. Stop!!!! Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods
F-TD-212	<p>Toxics In Products By Design</p> <p>The question posed by California's Department of Toxic Substances Control (DTSC) in this section of the "Conversation with California" goes to toxics intentionally contained in a product, and the possible policy responses to address those cases.</p> <p>It has been noted elsewhere that everything is or can be toxic in some measure. The inherent toxicity of a substance (based on its hazard characteristics) needs to be distinguished from the apparent toxicity of the substance as it is used. While a human exposure to a single molecule may not constitute a serious threat, a massive exposure to even a benign material can have significant consequences. So dose matters, and exposure matters. Risk—the combination of exposure and inherent toxicity—must be considered.</p> <p>It is particularly important to understand how DTSC construes the term "in products by design." If DTSC interprets the term to mean a toxic "used to create the product but not present as the product is used," the possible policy responses are very different from an interpretation that focuses on a toxic "in the product as used and from which the user has a possible exposure." Indeed, the latter case may be more appropriately considered the case of a toxic present by accident.</p> <p>Let's assume for the moment that California intends the Green Chemistry Initiative to articulate some particular principles that might be applied to minimize the potential risks of toxics. Because everything can be toxic in some measure, there should be no absolute principle against the use of toxics per se. Perhaps California might base its future policies on a general principle about minimizing the use of toxics to the extent possible consistent with environmental and health considerations, efficiency, economics, and product performance, or encourage the design of products so that at the end of their use no new or elevated threat to health or environment is created.</p> <p>Indeed, from those very general principles it becomes evident that the DTSC may wish to focus on those materials that persist unnecessarily in the environment or that accumulate in biological materials. There are objective criteria for these two hazard characteristics that can be measured and are widely accepted, and provides a more productive direction for the discussion of "toxics" in products by design.</p> <p>Taking persistence and bioaccumulation into account provides a sharper tool to distinguish chemicals for potential regulatory attention. If a precautionary approach suggests doing no harm, even DTSC should be careful to design measures that do no harm overtly and that do not unintentionally do harm by removing truly useful substances.</p> <p>Several existing programs provide sound models for characterizing and assessing the persistence and bioaccumulating properties of chemicals. The U.S. Environmental Protection Agency (EPA) has for some time made its "PBT Profiler" evaluation tool freely available. See http://www.epa.gov/pbt/tools/toolbox.htm. The tool is an important risk screening tool, and has been used effectively in assuring that EPA's policy on new chemicals that exhibit persistence and bioaccumulation is followed.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Canada, Mexico, and the United States recently agreed to a program to complete screening level risk assessments on approximately 9,000 substances in North American commerce by 2012—the vast majority of the chemicals in U.S. commerce. The program builds on Canada’s efforts to prioritize chemicals for further review according to their persistence, bioaccumulation, and toxic characteristics. The Canadian program identified some 500 high priority chemicals that will require additional assessment and possible regulatory action. The program also “set aside” some 19,000 chemicals on the Canadian inventory as being of low or no regulatory concern (like the U.S., the Canadian chemical “inventory” is a historical database of chemicals that were on the market; both inventories contain more chemicals than are actually in commerce). More information on the regional screening program is available at http://yosemite.epa.gov/opa/admpress.nsf/0cd7fdf95b701616852572a000658ef2/77660c0da9fe643e8525733e0065d48b!OpenDocument. DTSC should determine how it can leverage the results of this assessment program in its recommendations, as well as identifying and finding alternatives for those chemicals identified as priority chemicals.</p> <p>As DTSC considers recommendations under the Green Chemistry Initiative, persistence and bioaccumulation are appropriate priorities in a focus on toxics in products. Such an approach can leverage the considerable number of assessment tools and information that already exists, while providing important assurance that potential impacts on health and the environment from particular risks have been addressed.</p>
F-TD-213	<p>No more testing on animals Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific. Advanced computer programs can now simulate any necessary testing method vs the cruel use of animals in experiments.</p>
F-TD-214	<p>toxicity testing on animals Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California’s implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-215	<p>Understanding TSCA Sections 4 and 6</p> <p>At several of the Green Chemistry Initiative stakeholder meetings held over the past few months, and in several entries in the “Conversation with California,” the U.S. Federal Toxic Substances Control Act (TSCA) has come under attack. Some have suggested that the law provides no basis for California to assume that health and the environment have been protected from unwanted or unnecessary chemical exposures. In fact, some say that the U.S. Environmental Protection Agency (EPA) is unable to ban chemicals.</p> <p>California’s Department of Toxic Substances Control (DTSC) is going to make recommendations on chemical regulatory matters as a result of the Green Chemistry Initiative. Some of those recommendations may include additional regulatory programs, actions that the legislature should consider, and some will likely be related to how the state drives a “green chemistry” approach through policy and the marketplace. As far as I know, no one is suggesting that California simply rely on the U.S. EPA and TSCA when it comes to chemical regulatory decisions. But it is important that Californians understand that the Toxic Substances Control Act provides an effective chemical management system, so that the state does not duplicate effort or waste scarce resources. Some of the misperceptions about TSCA involve EPA’s testing authority under Section 4. Some claim that the law imposes too great a burden on the agency, making it difficult for EPA to justify issuing test rules. The truth is EPA only needs to meet a modest burden to support a test rule on a chemical. The law only requires EPA to show that a substance MAY present an unreasonable risk, or MAY reasonably be anticipated to enter the environment in substantial quantities, or that there is or MAY be significant or substantial human exposure. EPA has even said that when it considers whether a chemical “may present” a hazard, it does not require definitive scientific data, but of necessity looks to reasonable scientific assumptions, extrapolations, and interpolations.</p> <p>EPA has even stated that it only need to establish that exposure MAY arise because of activities associated with the manufacture, use, etc. of the chemical. Federal courts have ruled that EPA can rely on the mere POTENTIAL for human exposure in deciding whether a chemical “may present an unreasonable risk.”</p> <p>Section 6 of TSCA gives EPA authority to regulate the manufacture, processing, distribution, use, or disposal of a chemical if the agency has a “reasonable basis” to believe the chemical “presents or will present an unreasonable risk to health or the environment.” Section 6 identifies various regulatory options—from an outright ban to warning and labeling requirements—and provides that EPA may impose one or more of the listed requirements “to the extent necessary to protect adequately against such risk using the least burdensome requirement.” That was Congress’ way of telling the agency to take the most efficient regulatory approach consistent with the potential threat to health and the environment.</p> <p>When acting under Section 6, EPA must, among other elements, take into account the health and environmental effects of the substance, the magnitude of exposure, the benefits of the substance, the availability of substitutes, and the reasonably identifiable economic consequences of the proposed rule. Some say that EPA can’t regulate effectively under Section 6 because of a federal court decision that overturned an EPA ban on certain asbestos-containing products. Critics like to say, “If EPA cannot ban asbestos, then what can it ban?” The truth is that EPA’s failures in the asbestos regulation were not deficiencies in the statute, they were failures in implementation. Simply put, EPA did not do what Congress told it to do. The fact is, EPA has used Section 6 rulemakings since the asbestos case was decided, albeit not very frequently, largely because TSCA provides multiple authorities for EPA to achieve its desired risk management results.</p> <p>TSCA critics want to suggest that these perceived failings in the federal statute should persuade California that the state must step in to correct these “deficiencies,” by establishing its own chemical regulatory system, among other approaches. The fact is, TSCA is protective of public health and the environment. There may well be important opportunities to improve the timing, quality and transparency of EPA’s chemical management decisions, and important opportunities to enhance the level of cooperation and coordination between the California and U.S. EPA.</p> <p>Which leads back to one of the fundamental questions that the Green Chemistry Initiative needs to grapple with—what is the problem that needs to be addressed?</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-216	<p>In claiming that TSCA Sections 4 and 6 work well and are easy for EPA to use, Mike Walls of the American Chemistry Council (ACC) omits or glosses over key aspects of what EPA must do to use these authorities. I address some of these below.</p> <p>But first consider that the real proof of the effectiveness of these provisions is, as they say, in the pudding:</p> <ul style="list-style-type: none"> • Over the 30 years TSCA has been in effect, EPA has succeeded in issuing test rules or enforceable consent orders under Section 4 for fewer than 200 of the many tens of thousands of chemicals that have been in commerce over that same period. • Over that same period, EPA has succeeded in restricting only five chemicals (and then, only certain uses or occurrences of them) using its Section 6 authority: <ol style="list-style-type: none"> 1. PCBs (accomplished through an additional statutory mandate); 2. fully halogenated chlorofluoroalkanes used as propellants in aerosol spray containers (superseded by a ban under the Montreal Protocol); 3. the removal for disposal of certain wastes containing dioxin at a specific site in Arkansas; 4. asbestos, but limited to products no longer in commerce, because the initial rule was vacated by U.S. courts after legal challenge (see more below); <p>and</p> <ol style="list-style-type: none"> 5. hexavalent chromium-based water treatment chemicals for use in comfort cooling towers. <p>Here's some of what Mike left out in his discussion of TSCA Section 4 test rules: To require testing of a chemical under Section 4, EPA must issue a rule using full notice-and-comment rulemaking. It can do so only if it makes a number of findings, not just one as Mike claimed. EPA must find, based on sufficient evidence, that:</p> <ul style="list-style-type: none"> • the substance “may present an unreasonable risk,” based on evidence of more than a theoretical risk of exposure, <p>OR:</p> <ul style="list-style-type: none"> • it is or will be produced in “substantial” quantities and either: <ul style="list-style-type: none"> o it is entering or may enter the environment in “substantial” quantities, or o there is or may be “significant or substantial” human exposure to the chemical, <p>AND:</p> <ul style="list-style-type: none"> • insufficient information exists to assess potential risk, <p>AND:</p> <ul style="list-style-type: none"> • testing is necessary to develop the needed data. <p>Making the latter two findings is non-trivial; each requires substantial time and resources and is frequently the basis for challenges by industry (ACC members among them) during the comment period for a proposed rule, and sometimes via lawsuits brought against the Agency after a final rule is issued.</p> <p>EPA itself has noted that using its Section 4 authority is difficult and imposes substantial burdens, for a number of reasons. In practice, EPA says it rarely has enough information to make the “may present an unreasonable risk” finding, and instead is usually forced to rely on making the exposure-based finding. But EPA reports that obtaining the requisite exposure information needed for rulemaking is particularly difficult. EPA also indicates that finalizing rules under Section 4 can take from 2 to 10 years and require the expenditure of substantial resources – resources that are in increasingly short supply as its budget has been declining. (EPA provided these comments to the Government Accountability Office, and they are discussed in GAO’s 2005 report, Options Exist to Improve EPA’s Ability to Assess Health Risks and Manage Its Chemical Review Program, pp. 25-26, at http://www.gao.gov/new.items/d05458.pdf, and GAO’s 1994 report, Toxic Substances Control Act: Legislative Changes Could Make the Act More Effective, pp. 45-47, available at archive.gao.gov/t2pbat2/152799.pdf.)</p> <p>Two examples:</p> <ul style="list-style-type: none"> • EPA has succeeded in issuing one test rule covering only 16 of the more than 250 unsponsored chemicals under its voluntary HPV Challenge Program.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>That rule took more than 5 years to promulgate. Proposal of a second rule that will cover only about 40 more unsponsored HPV chemicals is already years late. EPA will not be able to require testing for many of these unsponsored chemicals because it cannot make the requisite findings.</p> <ul style="list-style-type: none"> • In 1991, OSHA identified 658 chemicals for which it needed data on dermal (skin) absorption due to potential worker exposure, and requested that data be developed for them using a relatively inexpensive in vitro test. OSHA cannot itself require companies to test chemicals, and must instead request that EPA do so using its Section 4 authority, as it did in this case. Eight years later, EPA proposed a test rule covering 47 of these chemicals, because these were the only ones for which EPA could make the required Section 4 findings. This proposed rule was heavily challenged by industry, with the result being that the final rule covered only 34 chemicals and was not issued until 2004 – 13 years after identification by OSHA of many hundreds of chemicals for which it needed the data. <p>As for TSCA Section 6, Mike's rendition of the asbestos saga reflects what has become a fashionable storyline of late among some in the chemical industry: He essentially resorts to "blaming the victim" – in this case EPA – by claiming the agency simply didn't do a good job. In fact, EPA spent over a decade and millions of dollars developing the Section 6 rule, in the process compiling a 45,000-page record, making it one of the most extensive and expensive rulemakings in EPA history. (For more balanced views of the history of Section 6, see, for example: Carnegie Commission on Science, Technology, and Government, Risk and the Environment: Improving Regulatory Decision Making, 1993, available online at www.carnegie.org/sub/pubs/science_tech/reg.txt; and Lisa Heinzerling, Testimony Before the Subcommittee on Environment and Hazardous Materials of the Committee on Energy and Commerce, U.S. House of Representatives, July 13, 2004, at www.law.georgetown.edu/faculty/Heinzerling/Testimony/POPs_Testimony_July_2004.pdf.)</p> <p>This "blame the victim" argument also demonstrates considerable chutzpah on Mike's part, since of course groups like ACC and its members stand at the ready to challenge any rule EPA does manage to propose or finalize.</p> <p>Here's what EPA is required to assess and the findings it is required to make under TSCA Section 6 to control any chemical in commerce: It must first find that the chemical "presents or will present an unreasonable risk of injury to health or the environment." To do so, EPA must evaluate not only health and environmental effects and exposure, but also the benefits of the chemical; the availability of substitutes; and the economic and social effects of the rule it proposes, including impacts on the economy, small businesses and innovation. EPA must prepare analyses of hazard and exposure, conduct a risk assessment, develop a substitution analysis for each use it proposes to restrict, and provide a full economic (cost-benefit) analysis. Then it must demonstrate that the proposed control is the least burdensome it could have proposed. Finally, it must demonstrate that no other statute could address the concern. EPA must also develop and finalize its regulation through full notice-and-comment rulemaking.</p> <p>Is it really any wonder EPA has given up trying?</p>
F-TD-217	<p>Stop Toxicity Tests on Animals</p> <p>I am a resident of California and was dismayed to learn that the CalEPA is considering large scale, cruel laboratory tests on animals, which would result in the torture and death of thousands of animals. CalEPA can still support "green chemistry" by researching and developing human-focused testing methods, such as cell and tissue assays.</p> <p>"The greatness of a nation and its moral progress can be judged by the way its animals are treated."</p> <p>--Mahatma Gandhi</p> <p>California should lead the nation as well as the world in how we treat our animals.</p>
F-TD-218	<p>Testing toxicity on animals is unethical, wasteful and counter-productive</p> <p>We should use good science responsibly as we begin to take responsibility for our own mess. Testing toxicity on animals is shameful as well as poor</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	science.
F-TD-219	<p>Create a Priority List A list of the most toxic chemicals should be compared with the importance of their use and the degree of difficulty of their removal, change in usage, or substitution. There are many toxic chemicals which find usefulness, such as zinc oxide (a carcinogen at certain levels) which are in fact food additives (this one is a vitamin additive in cereals). Zinc oxide ointment is also useful. The list should also prioritize on the basis of quantity. Perhaps zinc oxide quantities are less than, say, thalate or bispenol-A quantities.</p>
F-TD-220	<p>Dr. We must develop ways to eliminate toxic chemicals in our environment now. In the last 50 years we have polluted our air, water and soil blindly. If we don't change our practices now what will be left for future generations. We must develop humane methods and consider Green Chemistry.</p>
F-TD-221	<p>Toxicity testing on animals As a citizen of California who cares about the environment and animals in laboratories, I wish to comment on toxicity testing. - Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. -We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. -California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. -Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. -Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific. Thank you for the opportunity to comment.</p>
F-TD-222	<p>California need to lead the way for the environment Protecting the environment is not only a matter of personal interest, it is in the best interest of every Californian. Any program or process must be open and made available for public input and total scrutiny by our gifted scientific community. We need to get a handle on the toxic chemicals in our environment quickly. What this means is developing and using cost- and time-efficient computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science. All efforts related to toxicity testing should take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific. I am a concerned citizen of California and I know for a fact that we as a state are capable of setting the goals and achieving greatness when it comes to environmental legislation and stewardship.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	Please consider my comments when devising strategies to encourage manufacturers to take greater responsibility for the products they produce that contain toxic materials.
F-TD-223	<p>CalEPA- recommendations on protect human health w/o to cruel lab. tests on animals. Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. We need to get a handle on the toxic chemicals in our environment quickly-that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p>
F-TD-224	<p>mr The California Environmental Protection Agency (CalEPA) is looking for recommendations for "green chemistry" policies and regulations, which could include large-scale toxicity testing initiatives that would result in the deaths of thousands of animals. You can help prevent these animal tests by contacting the CalEPA today! PCRM scientists have attended meetings and workshops held at CalEPA in order to provide the agency with recommendations on how to protect human health without resorting to cruel laboratory tests on animals. CalEPA is also accepting public comments from Californians until Friday, Nov. 16. Please take a moment to compose a short statement on the importance of researching and developing human-focused testing methods, such as cell and tissue assays. Follow this link, scroll to the bottom, click on "Create New Post," and compose a personal comment. As a citizen of California who cares about the environment and animals in laboratories, CalEPA needs to hear from you! You may want to include the following points: * Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. * We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. * California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p> <p>* Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods.</p> <p>* Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.</p> <p>Thank you so much for your compassion and commitment.</p> <p>Best regards,</p>
F-TD-225	<p>Chemical Testing: Use Only Cell & Tissue Assays</p> <p>It has come to my attention that chemical testing activities directed at live animals continue in the state of California. Departments, labs, and organizations should cease and desist activities of this nature. It is reasonable, prudent, ethical, and ultimately more accurate and effective to use only human-focused testing methods such as cell and tissue assays.</p> <p>Please note the following:</p> <p style="padding-left: 20px;">A recent report by the National Academy of Sciences, entitled "Toxicity Testing in the Twenty-First Century: A Vision and a Strategy," recommends an overhaul in the way chemicals are tested for toxicity. California's implementation of green chemistry goals should be consistent with this vision, and the state should commit resources to this effort.</p> <p style="padding-left: 20px;">Animal-based toxicity testing methods are dismally inaccurate, and they result in the painful deaths of hundreds or thousands of animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these outdated testing methods.</p> <p style="padding-left: 20px;">Thousands of chemicals have already been tested in other government programs, and existing data must be gathered, fully evaluated, and used prior to initiating further testing requirements.</p> <p>Thank you for your time and consideration.</p>
F-TD-226	<p>Science Without Sadistics</p> <p>As a citizen of California who cares about the environment and animals I strongly support the importance of researching and developing human-focused testing methods, such as cell and tissue assays.</p> <p>CalEPA should focus on developing and using cost & time efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes.</p> <p>Animal-based toxicity testing methods are inaccurate and result in the painful deaths of many animals. Protect human health without resorting to cruel laboratory tests on animals.</p> <p>Furthermore, California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-227	<p>No animal testing: both a scientific and moral imperative In silicon valley for may years we had been told about our "clean industries." It is now apparent that the high tech industry is a major source of chemical pollution in all phases of production (manufacture to disposal). Dealing with these problems is important to the health of all; and so is the approach we take. I urge CalEPA to reject animal testing as part of any program to develop chemical policies and regulations. In addition to being inaccurate, animal testing results in the the torture and death of many animals to address a mess we humans have made. We have both a scientific and moral imperative to use currently available and superior methods to address the damage we have caused to the environment.</p>
F-TD-228	<p>Going green does not require testing on animals. 1. Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. 2. We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. 3. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. 4. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific</p>
F-TD-229	<p>No animal testing Please, let's move into the 21st century and use humane alternatives to cruel, barbaric animal testing. The alternate testing exists and it is more accurate. Going "green" means good for everyone and everything effected. Let's follow that true standard.</p>
F-TD-230	<p>Sustainability - the jigsaw puzzle Putting the Jigsaw Puzzle Together: Comprehending the bigger picture of global sustainability encompasses inextricably interconnected issues such as geometric population growth, escalating increases in per capita consumption, toxic environmental pollution, global warming and climate change, externalities which are not incorporated into economic and business models, rapidly depleting non-renewable natural resources and materials, damaging ecological impacts of activities such as monoculture, aquifers sucked dry, animal/ecosystem habitat destruction and population collapse, soil erosion and desertification, exhausted ocean fish-stocks, wholesale mammal species extinctions, rainforest logging and clearing – the biomass capital of the world being rapidly consumed, following encroachment of apex-predator humans into every part of the world – these are all pieces of the same jigsaw puzzle. The extinction of most other life forms on the planet is the price being paid for untrammled increases in human population. But its unsustainable. How will it end? Humans need to change to holistic social, political and economic paradigms in conducting our activities on the planet, both for the survival of Spaceship Earth as an ecosystem, and for every species in it, including humans, so succeeding generations can live into a future that is worth living.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-231	Animal Testing is wrong and unnecessary Most animal testing produces results that are unreliable since animals do not respond the same way as humans do in most tests. Other testing models exist that produce faster, less expensive and more reliable test results. In addition, it is immoral to test on animals. That is not God's purpose for His animals. Humans are poor stewards of the earth and its creatures and we all need to change that.
F-TD-232	No more animal testing! I can't believe that California is even considering doing further animal testing on reaction to toxics! It is absolutely reprehensible, and we must cease and desist immediately, so as to set a god example to the rest of the nation! You have only to consult the Union of Concerned Scientists and Physicians for the Ethical Treatment of Animals to find other cheaper ways to test toxics.
F-TD-233	abolish animal testing and research Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes over a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific
F-TD-234	California needs to be smart, not cruel ... Protecting the environment is in the interest of every Californian, and any programs or processes should be open and transparent with an opportunity for public input. We need to get a handle on the toxic chemicals in our environment quickly—that means developing and using cost- and time-efficient high-throughput human cell and tissue methods, computer-based methods such as (Q)SAR, and intelligent, tiered testing schemes. California's implementation of Green Chemistry goals should align with the vision for 21st-Century Toxicity Testing put forth by the National Academy of Science by committing funding and resources to this effort and ensuring any Green Chemistry initiatives related to toxicity testing take this groundbreaking report into account. Animal-based toxicity testing methods are inaccurate and can result in the painful deaths of hundreds or sometimes more than a thousand animals per chemical. California cannot ensure the health and safety of its citizens or wildlife by relying on these methods. Data gathering requirements must take advantage of existing data gathered from other testing programs as well as intelligent testing strategies. Requiring a fixed list of toxicity tests for all chemicals is wasteful and unscientific.
F-TD-235	STOP DOING CRUEL TOXICITY TESTS ON ANIMALS This practice is outdated in todays times. It needs to be stopped!
F-TD-236	Please stop all toxicity tests on animals. They are outdated and we don't need them any longer. Animals feel pain and suffering like we do. Please stop the suffering now.
F-TD-237	Stop all toxicity tests on animals NOW!

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-238	<p>please stop all animal testing there is no need for them and the animals feel pain and fear the same as we do</p> <p>Thoughts on Fostering Product Stewardship The Consumer Specialty Product Association's (CSPA's) members are committed to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers. To demonstrate this belief and practice, in 2001, CSPA initiated our Product Care program. CSPA's Product Care program is a stewardship program for the consumer and institutional specialty products industry where participating companies have agreed to go beyond government regulations in emphasizing health, safety and environmental concerns by carefully designing products, purchasing raw material and packaging, operating safe manufacturing facilities, promoting safe storage and distribution, providing useful product information, answering consumers questions and anticipating product disposal needs. CSPA believes that these types of product stewardship programs should be considered as frameworks for programs developed under the Green Chemistry Initiative. Product Care provides a framework for companies to identify and commit to stewardship principles, share ideas and information and benchmark better performance. Participating companies have pledged to develop management principles for each of seven areas in a product's life cycle from development in a research facility through product use and disposal. In doing so, Product Care participants commit to the following concepts:</p> <ul style="list-style-type: none"> • We will strive to improve our efforts to protect and reach out to our employees, our customers, the community and the environment, as they are affected by our products and operations. • We will seek and value public comment regarding our products and operations. • We will provide information on safe and effective use of our products, as well as their health and environmental risks, to consumers and other affected stakeholders, encouraging them to partner with us in the appropriate use and disposal of our products. • We will, through CSPA, work with government and other stakeholders in the ongoing review and development of responsible laws, regulations and industry practices to help safeguard the home, workplace, community and environment. • We will promote our values to our contractors and other business partners. • We are committed to the sustainability of our environment and economy, and will work in partnership with governments and other stakeholders to encourage sustainability. <p>1. Product Design</p> <ul style="list-style-type: none"> • We will independently seek to design products, packaging and labeling that are appropriate for the intended uses, and seek to minimize potential harm to our employees, customers, consumers and the environment. • We will have our products evaluated for health and safety in an effort to identify the consequences of potential exposures. <p>2. Raw Material, Package and Service Supply</p> <ul style="list-style-type: none"> • We will have an internal process for our independent selection of raw material, package and service suppliers to promote our product stewardship objectives. • We, as suppliers, will share our expertise and information to assist our customers in using our materials and services safely and effectively in their operations. • We, as formulators, will make full use of the expertise and information of our suppliers to help us use their materials and services safely and effectively in our products and operations. <p>3. Manufacture and Production Site Management</p> <ul style="list-style-type: none"> • We will have systems in place to identify potential risks to our workers, the community and the environment presented by our operations, and design prevention measures to manage, reduce or eliminate those risks.
F-TD-239	

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> • We will have emergency response programs for our facilities. <p>4. Product Storage and Distribution</p> <ul style="list-style-type: none"> • We will establish and make available procedures for the handling, storage and distribution of our products to protect personnel, property and the environment. • We will have an emergency response plan to address the risks associated with our handling, storage and distribution. <p>5. In-market Support, Incident Evaluation and Follow-up</p> <ul style="list-style-type: none"> • We will support dissemination of safety related product information regarding routine use of our products that is accurate, complete and in context to the inquiry or concern. • When product-related incidents occur, we will have systems in place to minimize adverse effects, assist our consumers/customers and provide needed information. • We will strive to influence product and label design as well as develop educational messages on safe and responsible product use based on information regarding unintended events and other types of exposures involving our products. <p>6. Consumer Education and Outreach</p> <ul style="list-style-type: none"> • We will support public education programs that promote the safe and effective use of our products, and that help consumers put exposure and toxicity in proper context with hazard and risk. This can be done through programs of CSPA and the Alliance for Consumer Education (ACE). • We will provide appropriate training materials when necessary to assure the proper and safe use of our products that are intended for commercial, institutional or industrial consumers. • We will communicate appropriate environmental, health, safety and efficacy information, as well as warnings, to employees, distributors, and consumers, and ensure that labels, labeling, bulletins, material safety data sheets, and other appropriate product information, are designed to be accurate and not misleading. <p>7. Product Disposal</p> <ul style="list-style-type: none"> • We will strive to make our products and packages compatible with typical municipal solid waste or sewage handling systems, encourage recycling of our products where recycling exists, and support other forms of waste minimization. • We will support programs of Integrated Waste Management (IWM) in communities, recognizing the distinct roles of manufacturers, retailers, governments, and consumers in the cost-effective management of waste. <p>Stewardship did not begin when CSPA's Product Care program was initiated in 2001. Responsible companies have long followed policies promoting safe products that provide important health benefits while not adversely affecting the environment. CSPA believes it is vital that these types of product stewardship programs and companies that participate in these programs be recognized and fostered through any program developed under the Green Chemistry Initiative.</p>
F-TD-240	<p>Stimulating Green Chemistry</p> <p>"Green Chemistry" is an intellectual framework that aligns technology innovation with improvements in the health and environmental "footprint" of materials used in our society. It requires inter-disciplinary collaboration among a variety of experts in chemistry, toxicology, and environmental science that work in business, government, and academia. Government cannot, and should not, dictate by statute or regulation precisely how this process for innovation and collaboration should occur.</p> <p>Importantly, a "Green Chemistry" program, in and of itself, should not be picking "winning" or "losing" products. Instead, it should be removing barriers and creating objective tools to allow companies to create new products and enable consumers to recognize and choose them. According to a March 28,</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>2002, publication of the Organisation for Economic Co-operation and Development (OECD) (of which the United States is a member) entitled, "Need for Research and Development Programmes in Sustainable Chemistry" (available at http://www.oecd.org/dataoecd/9/55/2079870.pdf), "For government, sustainable chemistry is a non-regulatory way of making regulations work more effectively." OECD at 15.</p> <p>Member companies of the American Chemistry Council (ACC) are leaders in Green Chemistry and Green Engineering in their operations and have been honored for their efforts (e.g., see http://www.epa.gov/greenchemistry/pubs/pgcc/past.html for a list of EPA Presidential Green Chemistry Challenge winners). Our members view both the American Chemical Society's (ACS) Green Chemistry Principles and the ACS Green Engineering Principles as useful approaches to resource efficiency, pollution prevention, and safety. These principles, however, were never intended to be applied as government mandates. In fact, prominently displayed on the home page of the Green Chemistry Institute is the statement:</p> <p>Green Chemistry differs from previous approaches to many environmental issues. Rather than using regulatory restrictions, it unleashes the creativity and innovation of our scientists and engineers in designing and discovering the next generation of chemicals and materials so that they provide increased performance and increased value while meeting all goals to protect and enhance human health and the environment.</p> <p>So, how can California encourage Green Chemistry rather than attempt to mandate it? Several actions may be taken to stimulate Green Chemistry in California and the United States broadly. For example, government can and should provide encouragement for Green Chemistry collaborations through the sharing of expertise, financial support for research, information exchange, and public education. In fact, a variety of federal agencies (including EPA and DOE), companies, professional associations such ACS, Non-Governmental Organizations (NGO), and universities are already working together to encourage Green Chemistry strategies. Additionally, government should consider offering incentives for companies to pursue and foster Green Chemistry and Green Engineering to help ensure these products/technologies can become economically viable and gain initial access to a competitive marketplace. These incentives might include tax incentives, low interest loans, awards, and marketing exposure.</p> <p>I. Education and Research/Development</p> <p>Industry is always working to drive down production costs. For specialties and fine chemicals, the synthetic chemists working in developing these materials have to know how to ask the Green Chemistry questions. This stands squarely in the realm of science education, especially in schools of chemistry. Not only do chemists and others involved in chemistry need to understand toxicology, but they also need to better understand the interaction between health and environmental protection, toxicology, and price. It is therefore essential that California support education in the methods and principles of Green Chemistry for all its state colleges and universities (and in its high schools and vocational schools, as appropriate). Anywhere that chemistry is taught, toxicology and Green Chemistry should also be taught.</p> <p>Additionally, California should encourage innovative research in Green Chemistry and Green Engineering. Research funding into new Green Chemistry methods is always welcomed by colleges, universities, and others, and should be an important part of any Green Chemistry program. According to the OECD (again referring to their March 2002 publication):</p> <p>Governments can promote sustainable chemistry R&D...by establish[ing] and fund[ing] programmes on sustainable chemistry R&D. ... In addition, parts of industrial programmes are often supported by government funds. Governments, in general, can provide funds for basic and pre-competitive research. ...Practically, governments can orient sustainable chemistry R&D programmes by adjusting the distribution of funds for fundamental and applied research or by commanding competitive and targeted funds depending on policies.</p> <p>OECD at 15.</p> <p>II. Incentives</p> <p>To further stimulate Green Chemistry and Green Engineering, California should consider the following incentives: (1) awards like EPA's Green Chemistry Challenge (see http://www.epa.gov/greenchemistry/pubs/pgcc/presgcc.html for more information); (2) tax incentives/subsidies/grants/low interest loans</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>for research and development; and (3) marketing exposure for Green Chemistry processes and products. For example, when California purchases chemicals for state contracts, it could decide to pay a modest premium for a set period of time for new “green materials” that show promise. The goal of this subsidy would be to help a new material achieve greater economies of scale, but avoid locking in an inefficient permanent subsidy. California could additionally make capital available to companies at preferential terms, whether via grant or lower interest loans, to encourage Green Chemistry and Green Engineering manufacturing process development. And California could also consider a marketing program (perhaps akin to the “California cows” and dairy ads currently on television) whereby the state would promote companies that are actively engaged in Green Chemistry and Green Engineering, and products that are the result of Green Chemistry and Green Engineering. The OECD suggests: [G]overnments can facilitate the consideration and application of sustainable chemistry R&D by supporting efforts which aim at educating and informing industry and the general public of the importance and benefits of sustainable chemistry. One possible role for government would be to identify incentives and disincentives for the promotion of sustainable chemistry and to use this information to modify or develop their policies accordingly. When appropriate, the use of incentives, such as a reduction in taxes or the use of subsidies, can be an effective way of supporting R&D by academia and industry in the field of sustainable chemistry. ... It is essential that any sustainable chemistry technology or product be competitive in the marketplace, at least in the long term. However, some of those technologies, even if they are beneficial in the long term, will not be able to survive economically without incentives. Economic incentives, such as subsidies or tax reductions, could be effective in these cases. OECD at 15 and 17.</p>
F-TD-241	<p>A Modern Chemicals Policy For California CALIFORNIA MEDICAL ASSOCIATION A MODERN CHEMICALS POLICY FOR CALIFORNIA (2007) Introduced by: San Francisco Delegation Whereas, the state, national, and global scale of industrial chemical production is immense and is expected to grow four-fold by 2050, and the chemical industry is an important industry with wide contributions to health and human development; and Whereas, ever-expanding research confirms that many chemicals that are useful to society are also known to be hazardous to human biology and health, particularly in utero and in developing children; and Whereas, for new and existing medications, the Food and Drug Administration has long required pre-approval evaluation of safety as well as efficacy, and many industrial chemicals with known impacts on human biology are present in human bodies at levels similar to active doses of medications; and Whereas, numerous other nations including Canada and the European Union are adopting more proactive health-oriented chemicals policies, based upon scientific knowledge, assessment, and accepted public health principles; and Whereas, there are long-standing deficiencies in the federal regulation of industrial chemicals, most notably in the Toxic Substances Control Act (TSCA), as confirmed by the National Academy of Sciences and others, and the University of California documented in a 2006 report to the California Legislature that TSCA's deficiencies are important and can be remedied; and Whereas, these problems include the projected appearance of 600 new hazardous waste sites each month in the U.S. over the next 25 years; the appearance of hundreds of industrial chemicals in human tissues and fluids, including those of infants; and the development of chronic diseases caused by chemical exposures on the job among 23,000 California workers each year; and</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Whereas, the American Public Health Association's leadership has recently endorsed a policy titled "Calling on the U.S. Congress to restructure the Toxic Substances Control Act and implement a modern, comprehensive chemicals policy", to be considered for adoption at the annual APHA meeting in November; Therefore, be it</p> <p>Resolved: That the CMA calls upon the State of California and United States to implement a modern, comprehensive chemicals policy in line with current scientific knowledge on human health, and which requires a full evaluation of the health impacts of both newly developed and existing industrial chemicals now in use; And be it further</p> <p>RESOLVED: That this matter be referred for national action (AMA).</p> <p>REFERENCES: http://www.healthandenvironment.org/science/papers on behalf of the California Medical Association</p>
F-TD-242	<p>Check out This Tool that Will Work!!!</p> <p>Last week I attended the Western Regional Pollution Prevention conference in San Diego and had a chance to see a demo of a software tool that would be incredibly effective in addressing some of the concerns here. In fact I understate my excitement because it is so eye-popping to see to see the software in action, I can only hope to do it justice here.</p> <p>The software is very sophisticated but unlike other solutions I've seen, this one is actually very user friendly. It is the first real tool I've seen that can be used by industry experts, academia and the general public. Wow, let me say that again...the general public can actually use this tool it is that user friendly.</p> <p>The implications for Compliance Managers, Risk Assessment Departments and Purchasing agents are enormous. In addition to these individuals who must regularly make decisions that affect their organization, colleagues, and communities, there are also many in the medical profession, biotech, agriculture, ecologists and yes even economists (!) can plug in use this tool to get the results they need.</p> <p>Those of us posting here can dig into the inner workings of the software, because behind the easy-to-use interface is a complex, meticulous database that has been so well tested and refined that it is virtually bulletproof with respect to passing peer-based reviews.</p> <p>Dr. George Thompson has spent 25 years creating a chemical database of 75 million data elements for more than 210,000 chemicals, 350,000 products compiled from over 1,000 sources. His software can generate a score that can accurately and effectively measure the toxicity levels in a given chemical recipe, process, or product and give specific information about the impact on Health, Safety and Ecology.</p> <p>Not only that, it is possible to cross reference information regarding the chemicals, CAS numbers, regulatory lists, (very exciting!) and can eliminate redundant data so that it's easier for departments to work together and get things done faster.</p> <p>There is much more detail that I can go into, however what's more important is that you, as you're reading this, get curious enough to check out Dr. Thompson's tool. It is worth the time to take a look, and even more than that, I would be thrilled to see the technology implemented as part of California's comprehensive solution. For this reason, I'm getting the word out on the other forums too.</p> <p>We need to be looking at this solution. There is no more time to wait.</p> <p>We must involve people at the business and community level.</p> <p>We must give people at the business and community level a tool that will work for them.</p> <p>Not just us.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Check out www.chemply.com Read more about this man's work. It is phenomental!!!!!!</p>
F-TD-243	<p>Ch</p> <p>Last week I attended the Western Regional Pollution Prevention conference in San Diego and had a chance to see a demo of a software tool that would be incredibly effective in addressing some of the concerns here. In fact I understate my excitement because it is so eye-popping to see to see the software in action, I can only hope to do it justice here.</p> <p>The software is very sophisticated but unlike other solutions I've seen, this one is actually very user friendly. It is the first real tool I've seen that can be used by industry experts, academia and the general public. Wow, let me say that again...the general public can actually use this tool it is that user friendly.</p> <p>The implications for Compliance Managers, Risk Assessment Departments and Purchasing agents are enormous. In addition to these individuals who must regularly make decisions that affect their organization, colleagues, and communities, there are also many in the medical profession, biotech, agriculture, ecologists and yes even economists (!) can plug in use this tool to get the results they need.</p> <p>Those of us posting here can dig into the inner workings of the software, because behind the easy-to-use interface is a complex, meticulous database that has been so well tested and refined that it is virtually bulletproof with respect to passing peer-based reviews.</p> <p>Dr. George Thompson has spent 25 years creating a chemical database of 75 million data elements for more than 210,000 chemicals, 350,000 products compiled from over 1,000 sources. His software can generate a score that can accurately and effectively measure the toxicity levels in a given chemical recipe, process, or product and give specific information about the impact on Health, Safety and Ecology.</p> <p>Not only that, it is possible to cross reference information regarding the chemicals, CAS numbers, regulatory lists, (very exciting!) and can eliminate redundant data so that it's easier for departments to work together and get things done faster.</p> <p>There is much more detail that I can go into, however what's more important is that you, as you're reading this, get curious enough to check out Dr. Thompson's tool. It is worth the time to take a look, and even more than that, I would be thrilled to see the technology implemented as part of California's comprehensive solution. For this reason, I'm getting the word out on the other forums too.</p> <p>We need to be looking at this solution. There is no more time to wait.</p> <p>We must involve people at the business and community level.</p> <p>We must give people at the business and community level a tool that will work for them.</p> <p>Not just us.</p> <p>Check out www.chemply.com Read more about this man's work. It is phenomental!!!!!!</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-244	<p>Total lifecycle evaluation Cal EPA should begin by picking a product, any product, and evaluating the entire lifecycle of that product. One or more companies may be interested in partnering with Cal EPA to evaluate their product. Cal EPA should analyze every aspect of that product's lifecycle, from the harvesting and processing of raw materials, to that product's ultimate disposal or "end of life" management. Cal EPA should focus on forms and quantity of energy used, and environmental harm done, for everything from mining the metals that go into the product, to the source of wood in the product, to what kinds and amounts of energy are used to transport raw materials, to what kind of and how much energy the manufacturer uses to make the product, in addition to the products formulation, and what happens to the product at its end of life. Questions to answer include: Are sustainable mining and timber harvesting providing raw materials. Are their more environmentally friendly ways to process and transport the raw materials. Is the manufacturer using renewable and sustainable energy (i.e., solar). Is the product designed for end of life management (recycling, reuse, materials recovery) What impact is the manufacturing and disposal of the product having in developing countries. Can hazardous materials in the product be replaced by less hazardous materials. And so on, and so on, and so on...</p> <p>This type of exercise would then be the paradigm for the evaluation of other products</p>
F-TD-245	<p>Green Energy and Renewable Resources It seems that most options have focused on designing products with different or new chemical formulations that are less harmful to the environment or human health. Something that may have been overlooked is efforts to use renewable resources and "clean" energy to support manufacturing. Cal EPA ought to encourage the use of renewable resources, continuously recycled materials, and green energy (i.e., alternative fuels and solar power) in manufacturing. Any program to reward or recognize "Green Chemistry" efforts ought to recognize companies that use renewable or continuously recyclable materials, and/or implement the use of green energy to support their manufacturing operations. Although the substitution of dangerous chemicals with less dangerous chemicals is definitely worthwhile, it is not the only approach to reducing the global and environmental impact of manufacturing. Cal EPA should think outside the box.</p>
F-TD-246	<p>Thoughts About Substitution Contributions from chemistry bring many benefits to society, but there are chemicals which can pose risks to health or the environment in certain circumstances. Some argue that the most sensible approach to these chemicals is to replace them with substances considered less hazardous—a seemingly simple concept, but substitution is not always feasible and not always the right choice. American Chemistry Council (ACC) members, through Responsible Care®, regularly consider substitution as an option in their broader green engineering and process design efforts. When doing so, companies must closely examine the implications for the safety, functional performance, and cost of alternatives to avoid ineffective changes with unintended negative health and environmental impacts. A good cook knows that you cannot arbitrarily change ingredients in a recipe. Whole wheat, rye, all purpose, and pastry are just a few of the many different varieties of baking flour. Yet, bakers know that while all flour is similar, many cannot be substituted without creating a result nobody would want to eat. The same holds true for chemical processing. You cannot simply replace one chemical ingredient for another without impacting the final product. Therefore, significant problems would result if chemical substitution were mandated as the solution of first choice without careful consideration of potential consequences. This is very much the approach taken by an international group of experts to the Intergovernmental Forum on Chemical Safety</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>(IFCS) earlier this year in talking about “informed substitution”. (see the background elements of the IFCS paper available at http://www.who.int/ifcs/documents/forums/forum6/12_original_prop.doc)</p> <p>SUBSTITUTIONS MAY CHANGE THE NATURE OF THE PROBLEM RATHER THAN SOLVE IT Mandatory bans and forced substitutions often are not a complete solution because, as one issue is addressed, another set of concerns may arise. This is the difference between “informed substitution” and “regrettable substitution”, with the goal of “informed substitution” being to avoid “regrettable substitution”. For example, the health and convenience of our lives has been greatly enhanced by modern refrigeration. Refrigerators originally used ammonia, a toxic chemical, as a coolant. As scientific discoveries were made, chlorofluorocarbons (CFCs) replaced ammonia. While CFCs are practically non-toxic, they were later implicated in depleting the ozone layer and eventually banned. CFCs were then replaced with hydrochlorofluorocarbons (HFCs), which have no impact on the ozone layer, are non-flammable, have low toxicity, and high energy efficiencies. Scientists have now learned that HFCs could contribute to global warming if released into the air. Alternative coolants such as hydrocarbons and carbon dioxide have been considered, but both need to be carefully examined because of the potential for emissions and the possible dangers from higher operating pressures. In another example, consider the Peruvian government’s decision to stop chlorinating drinking water. The result in 1991 was a five-year epidemic of cholera which spread to nineteen Latin American countries, causing more than one million illnesses and 12,000 deaths. After the outbreak, U.S. and international health officials criticized Peruvian water officials for not chlorinating the entire water supply. An official with the Pan American Health Organization (PAHO) blames the inadequate chlorination, at least in part, on concern over disinfection byproducts. In a 1997 article in the Journal of the American Water Works Association, Horst Otterstetter states, “Rather than being abated by increased use of chlorination, the waterborne transmission of cholera was actually aided because of worries about chlorination byproducts.” Substituting one material for another is never as simple or straightforward as it might at first appear.</p> <p>SUBSTITUTIONS MAY RESULT IN UNINTENDED ADVERSE CONSEQUENCES Trading in a fuel-hungry SUV for a moped may address energy efficiency concerns, but it’s probably not a reasonable option for a mother of four. Like the moped, forced substitution, without full consideration of the potential impacts, is impractical and unwise. For example, some substitute chemicals require higher processing temperatures and greater pressure conditions in order to achieve the same result as the original chemical. Additionally, if the substitute chemical is not compatible with the processing equipment, it can cause break downs or failures. In some circumstances, the substitute is not as effective as the original chemical and more quantity must be used which results in larger amounts of waste materials and increased waste disposal management and risks. All of these factors can lead to increased safety concerns for the worker population, as well as increased energy consumption by the company. This unintended consequence of substitution was clearly demonstrated in Europe when energy companies decided that fuel derived from plants would be more environmentally friendly than fossil fuels. Those companies developed specialized generators for palm oil, which increased demand. To keep up with that demand, palm plantations cleared large tracts of land by draining and burning peat land, resulting in huge carbon emissions into the atmosphere. The production of the plant derived fuel had an unintended consequence of creating more harmful emissions than the fossil fuels they were intended to replace.</p> <p>SUBSTITUTION IS NOT THE ONLY VIABLE APPROACH TO CONTROL RISK The principle of risk reduction is and always has been part of the normal day-to-day operations for the business of chemistry. Industry’s ability to innovate allows us to respond to society’s evolving needs for better, safer products. Beyond substitution, the chemistry industry considers many other options to minimize potential hazards, such as operational management systems, engineering controls, modifications to the chemical product, and waste management innovations. The industry also provides specialized consumer</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>training and works with communities to implement effective recycle/reuse programs. Through ACC's Responsible Care® initiative, ACC member companies go above and beyond government rules and regulations to continuously improve their environmental, health, safety, and security (EHS&S) performance. ACC members employ a rigorous EHS&S management system that is certified by third-party auditors. Among numerous other elements, auditors verify that our companies have systems to manage risk associated with chemical products including management of product development, transport, use, and disposal in a safe and secure manner. Companies are also audited on their programs to protect the environment and to conserve resources, as well as their efforts to dialogue with community stakeholders about the organization's impact on human health and the environment. Company performance under Responsible Care® is publicly shared through americanchemistry/responsiblecare.com. For more information on Responsible Care®, please visit http://www.responsiblecaretoolkit.com.</p>
F-TD-247	<p>CHANGE's Perspective on a Successful Program We write to you today on behalf of CHANGE, Californians for a Healthy and Green Economy. Ours is a broad-based growing coalition of approximately 35 environmental and environmental justice groups, health organizations, labor advocates, community based groups, parent organizations, and others who are concerned with the impacts of toxic chemicals on human health and the environment, as well as the lack of a regulatory framework that seeks to prevent exposures to toxic chemicals. We thank you for your leadership initiating the Green Chemistry Initiative and would like to take this opportunity to join the Conversation with California by offering our perspective on what would make the program successful in addressing the critical human and environmental issues related to chemical use.</p> <p>on behalf of CHANGE</p>
F-TD-248	<p>Dow Chemical's Green Chemistry Thoughts The Dow Chemical Company (Dow) is pleased to provide the following comments on California's Green Chemistry Initiative (GCI). On June 29, 2007 Dow provided initial comments that represented our principles for sustainable chemistry at a corporate level. That letter spoke of Dow's accomplishments in sustainability, Dow's aggressive 2015 Sustainability Goals, and Dow's suggestions for framing California's GCI. We have engaged fully in the DTSC's process; Dow people have spoken at two of the three Green Chemistry Symposia and have participated in the workshops, including serving as break-out session facilitators. This current submission offers Dow's more-detailed thoughts in the specific areas of:</p> <ul style="list-style-type: none"> § Life-Cycle Assessment § Eco-Labels § Consumer Choice § Environmentally-Preferred Purchasing § Incentives <p>on behalf of the Dow Chemical Company</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-249	<p>Chemistry is Essential to California Chemistry is essential to California. When the science of chemistry is applied, it helps make the lives of Californians and others throughout the world safer, healthier, and more productive. American chemistry also plays a fundamental role in helping the California economy be more energy efficient. Our products go into modern materials used to make insulation, weatherization equipment, firefighting and other emergency response equipment, lightweight vehicle parts, coatings, lubricants, and energy-efficient appliances. ACC members are proud to be doing our part to reduce greenhouse gas emissions and intensity and improve energy efficiency. In fact, we've improved energy efficiency by 46 percent since 1974 and reduced absolute greenhouse gas emissions by 10 percent since 1990 – exceeding the Kyoto Protocol's target and deadline.</p> <p>In addition to the 84,802 jobs directly created by the chemical industry in California, a total of 524,584 jobs in California are generated indirectly by chemical industry activity in California and other states. For every chemical industry job in California, a total of 4.5 jobs are created within the state, a total of 300,627 jobs. In total, 609,386 jobs in California are supported by the chemical industry. These jobs generate \$30 billion in earnings and \$1.7 billion in state and local tax revenues.</p> <p>Industries that use chemical or chemical-derived products include: farming, new residential construction, emergency response services, plastic bottle manufacturing, upholstered furniture manufacturing, dry cleaning services, building services and health care, to name just a few. In California, more than 4.9 million jobs (or 31.8% of all California jobs) are dependent on chemical products. These jobs generate \$230.8 billion in earnings and generate state and local tax revenues of \$13.4 billion.</p> <p>The principles of sustainable chemistry are at the heart of our everyday business of producing chemical products. ACC member companies incorporate Green Chemistry and Green Engineering in their operations, and have been recognized for their efforts; having won 9 Green Chemistry Challenge Awards issued annually by the US Environmental Protection Agency.</p> <p>For California, American Chemistry is essential to producing the products, jobs, and innovations that will help us achieve a more sustainable future.</p>
F-TD-250	<p>Have EPA programs really closed the data gap? These comments respond to the American Chemistry Council's comments titled "Addressing the Data Gaps" posted on October 15, in particular those characterizing the types and amounts of information reported to EPA under:</p> <p>(1) the TSCA Inventory Update Rule (2) the US HPV Challenge Program and the industry's Extended HPV Program.</p> <p>(1) Information submitted to EPA under the TSCA Inventory Update Rule For certain chemicals in commerce, limited and infrequent reporting of production, use and exposure information by manufacturers has just been initiated under EPA's Inventory Update Rule (IUR). Such reporting is required only of chemical manufacturers (and in some cases, processors), but not of companies that use chemicals, whether directly or as ingredients in products.</p> <p>Beginning in 2006, manufacturers of non-exempt chemicals produced or imported in amounts of 25,000 pounds or more per year per site are required to report to EPA the information noted by ACC – to the extent it is "known or reasonably ascertainable." For chemicals manufactured in amounts of 300,000 pounds or more per year per site, the additional information on downstream processing and use noted by ACC must be reported – but only to the extent that it is "readily obtainable."</p> <p>Fewer than 10,000 chemicals are covered by the basic production information reporting requirements, and only a few thousand of these will be subject to the more extensive reporting that extends to downstream processing and use information.</p> <p>Reporting is required only once every five years and then only for a single reporting year.</p> <p>Much of the information reported to EPA is designated confidential business information (CBI). Under TSCA, EPA is prohibited from divulging any CBI to</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>the public or to other governments, including the State of California.</p> <p>(2) Information developed under the US HPV Challenge Program and the industry's Extended HPV Program. For more detail and documentation of my comments below, see my recent report, High Hopes, Low Marks: A Final Report Card on the High Production Volume Chemical Challenge, available online at www.environmentaldefense.org/hpvreportcard. The Challenge represents the only systematic effort by the US Environmental Protection Agency (EPA) to foster the development of and public access to basic hazard data on a relatively large number of chemicals in commerce. It should be acknowledged that the program is developing and making public basic hazard information for more chemicals in less time than any prior effort, and it represents the first significant step taken in the US toward closing the gap between what we know and what we should know about widely used chemicals. But the limitations of this voluntary program and the information it is providing need to be understood as well. Because the Challenge is voluntary, it side-steps the onerous findings EPA must make to exercise its authority under Section 4 of TSCA to compel hazard testing of chemicals. However, for the same reason, EPA also has limited recourse to ensure full participation by manufacturers or the timely submission and high quality of hazard data sets developed for HPV chemicals. The following statistics on the status of the HPV Challenge, which began in 1998, are current as of July 2007. MORE THAN 18 MONTHS AFTER THE ORIGINAL DEADLINE, THE HPV CHALLENGE IS FAR FROM COMPLETE</p> <ul style="list-style-type: none"> • Two-and-a-half years after final data sets were due, fewer than half (47%) have been submitted. • 10% of eligible HPV chemicals were not volunteered for the Challenge by the companies that produce them; EPA has issued rules to compel testing for only 6% of these chemicals. <p>THE QUALITY AND COMPLETENESS OF FINAL DATA SETS HAVE YET TO BE DETERMINED</p> <ul style="list-style-type: none"> • The average quality of sponsors' initial submissions, while originally quite good, has declined over the course of the Challenge, especially in the past 18 months. The grade point average for initial industry submissions has declined from a solid B-plus in 2001 to a C-minus in 2006. • Of the final submissions examined so far by EPA, covering about 100 HPV chemicals, EPA has found that data gaps remain in about a third of them. <p>THE HAZARD DATA SUBMITTED ARE SCREENING-LEVEL DATA ONLY</p> <ul style="list-style-type: none"> • Hazard data being collected under the Challenge are limited to a subset of the Screening Information Data Set (SIDS), developed under the auspices of the OECD. • The SIDS data are generally acknowledged to be insufficient to provide the basis for a full hazard assessment, let alone a risk assessment, for a chemical. It relies primarily on testing of acute or subchronic toxicity, for example, and its ecological endpoints only include toxicity to aquatic organisms. <p>THE PROGRAM FOCUS IS LIMITED TO HAZARD DATA</p> <ul style="list-style-type: none"> • By design, the Challenge did not call for submission of use and exposure information, although some sponsors did submit some such information. • As a result, the program will provide little if any reliable, comprehensive information about the use of and exposure to HPV chemicals. <p>EPA HAS LITTLE RECOURSE IF DATA QUALITY IS POOR OR DATA ARE INCOMPLETE</p> <ul style="list-style-type: none"> • Because the HPV Challenge is voluntary, EPA has very limited ability to ensure that the data submitted by sponsors are of high quality and complete. While EPA and other commenters have often identified deficiencies in initial submissions, there is no legal or binding obligation on the part of sponsors to heed those comments. • EPA has agreed to conduct a quality and completeness review on final submissions, and to make known the results, but cannot compel sponsors to address any problems that are identified. <p>THE REGULATORY "BACKSTOP" FOR THE PROGRAM IS WEAK</p> <ul style="list-style-type: none"> • EPA's authority under TSCA to compel testing of the 10% of HPV Challenge chemicals that were not voluntarily sponsored is seriously constrained; to

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>date, EPA has issued test rules for only 16 (6%) of the 265 unsponsored “orphan” HPV chemicals. THE MAJORITY OF CHEMICALS IN COMMERCE ARE NOT HPVS</p> <ul style="list-style-type: none"> • While, as ACC notes, HPV chemicals constitute the bulk of chemicals in commerce when measured by tonnage, non-HPV chemicals far outnumber HPV chemicals. • The TSCA Inventory contains more than 82,000 chemicals that have been in commerce at some point since 1979. Based on the 2002 TSCA Inventory update reporting, EPA reported some 5,400 so-called medium production volume (MPV) organic chemicals manufactured in 2002 in amounts above 10,000 pounds per year; an unknown number of chemicals below that threshold are in commerce in the US, because they are not required to be reported. • The European Union (EU) estimates that about 30,000 chemicals are produced there in quantities at or above one metric ton (2,200 pounds) per year, fewer than 3,000 of which are HPV chemicals. <p>THE EXTENT OF SPONSORSHIP OF NEWLY EMERGED HPV CHEMICALS IS POOR</p> <ul style="list-style-type: none"> • Of nearly 600 newly emerged HPV chemicals – those that have reached HPV levels of manufacture since the Challenge was launched – eligible for sponsorship, only 40% have been sponsored through the chemical industry’s Extended HPV Program. • EPA has found wide gaps in publicly available hazard data for these chemicals. • No test plans for these chemicals have yet been made available, and industry has not provided any tracking system to monitor the status of these commitments. • No final data sets have been submitted, despite a claim when the program was launched that data would be submitted starting in 2006. • These findings indicate that the chemical industry is not making the development of, and public access, to hazard data on all HPV chemicals “evergreen” practices.
F-TD-251	<p>Some ideas for what California can do to start advancing chemicals policy Here are some ideas for what California can do to start to advance chemicals policy and promote green chemistry. They are derived from ideas I have presented at several GCI forums, but I wanted to add them into the mix being collected via the Conversation. What can California do?</p> <ul style="list-style-type: none"> • Ensure access to information gathered by others <ul style="list-style-type: none"> – Negotiate for access to confidential business information (CBI) submitted under the European Union’s REACH Regulation and under the Canadian Environmental Protection Act (CEPA) – Require companies making/importing chemicals in California that are subject to REACH or CEPA to submit the same information to California officials – Enhance existing IT infrastructure to receive and share the large volumes of REACH data • Set clear criteria to identify chemicals of concern <ul style="list-style-type: none"> – Can be hazard-based (e.g., PBTs) and exposure-based (e.g., chemicals detected through biomonitoring) – Use these criteria to drive further assessment and control of chemicals meeting the criteria – Require adherence to clear timelines for conducting assessments and making control decisions • Map the flow of chemicals in California by developing and sharing production/use info <ul style="list-style-type: none"> – Require California producers/importers and users to submit and update information on production and processing (amounts, facility locations), uses (including in products), and post-use management – Require updating of MSDSs to reflect all available data (US HPV Challenge, REACH, Canada) – Require disclosure of chemicals in consumer products

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> • Could focus initially on priority chemicals (Canada priority list, REACH Substances of Very High Concern (SVHC) list) • Advance the science <ul style="list-style-type: none"> – HPV, REACH data sets use 20+ yrs. old tests (“old toxicology”) – Fail to account for: <ul style="list-style-type: none"> > Emerging issues, e.g., endocrine disruption, development neurotoxicity > Emerging science, e.g., low-dose effects, timing of exposure during development > Emerging methods, e.g., toxicogenomics, high-throughput screening and mechanistic assays > Perpetual concerns: e.g., cumulative, aggregate exposures, susceptible subpopulations – California is well-positioned to help move toxicology into the 21st century – Can help to develop, road-test and share new methods, testing strategies – Utilize biomonitoring data and methods to advance dose and exposure measurement – Press industry, federal government to move forward – Collaborate with universities Why do this? <ul style="list-style-type: none"> • Casts a broad net – to identify not only “bad actors” but also chemicals of low concern • Influences and informs chemical and product design decisions • Identifies and fills gaps – information (data and safety) and technology gaps • Empowers a range of actors – government, industry, academics, public – to advance knowledge and make better decisions about chemicals
F-TD-252	<p>Limitations to Risk-Drive Approaches to Chemical Prioritization [NOTE: This post is based on a paper I published in the OECD Series On Testing And Assessment, No. 51, Approaches to Exposure Assessment in OECD Member Countries: Report from the Policy Dialogue on Exposure Assessment in June 2005, Chemicals Committee, Organization for Economic Cooperation and Development, p. 109, available at http://appli1.oecd.org/olis/2006doc.nsf/linkto/ENV-JM-MONO(2006)5. It is provided in part to respond to the American Chemistry Council's comments arguing for sole reliance on risk-based evaluation for chemicals.]</p> <p>While both hazard and exposure are clearly relevant in determining chemical risks, there are critical differences between our ability to assess hazard and exposure that have implications for the development and application of risk and exposure assessment policies. And real-world experience in chemical assessment programs that have attempted to rely on exposure information to prioritize chemicals also offers lessons for exposure assessment. In this paper I first address these issues, and then discuss their implications for risk and exposure assessment policies.</p> <p>Critical differences between assessing hazard and exposure</p> <p>Approaches to integrating exposure assessment into regulatory decision-making need to acknowledge and account for a number of critical differences between the nature of hazard and exposure information and their relative extent of availability. While both hazard and exposure are clearly relevant in determining risk, certain characteristics of exposure information pose serious challenges to sound decision-making:</p> <p>1. Hazard is largely inherent to a chemical, and doesn't fundamentally change over space or time, whereas any exposure information necessarily represents only a “snapshot” in both space and time.</p> <p>A chemical's hazard is relatively intrinsic, largely or entirely independent of how the chemical is used, where or how it enters the environment, or other factors that vary with time and place. Hazard data are therefore relevant (i.e., necessary though not sufficient) in characterizing risk whatever the use of a chemical, and hence are useful in understanding any and all potential uses of or exposures to a chemical -- and what kind of exposure-reducing efforts</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>may need to be taken.</p> <p>Just the opposite is true for exposure, the potential for which changes depending on how a chemical is produced, used, transported and discarded. Conditions that determine exposure can and often do differ enormously for every setting and point in time that a chemical is present. And even if a “snapshot” of current exposure were able to be assembled, the next new use or activity leading to a release would alter the exposure picture. The variable nature of exposure poses a major challenge to exposure (and risk) assessment: It means that exposure assessment must be an ongoing activity, with the scope and frequency of its measurement sufficient to characterize the variation in as well as magnitude of exposure.</p> <p>2. Voluntary and regulatory mechanisms for generating and collecting exposure information are undeveloped relative to those for hazard information. Extensive international consensus exists as to how to test a chemical for most hazardous properties. Detailed government-sanctioned procedures, guidelines, criteria and standards are already in place for conducting hazard tests, for assuring the quality and reliability of the results, and for determining whether the results constitute evidence of a particular hazard. Moreover, these measures allow that results are reproducible and can be independently verified.</p> <p>In contrast, virtually none of these mechanisms are in place to assure that exposure information is complete and accurate. Debates over what constitutes adequate exposure assessment and how to address the “moving target” nature of such information are far from resolved. Government-sanctioned procedures for generating, evaluating the adequacy of and interpreting exposure data have yet to be developed or validated, including testing and measurement standards, guidance, methods and tools.</p> <p>Even use and exposure information reported in sufficiently qualitative terms or sufficiently aggregated form so as to eliminate any confidential business information (CBI, see next bullet) concern is rarely systematically collected and made public. For the first time, beginning in 2006, USEPA has begun to require the reporting of basic information relevant to understanding uses of and exposure to chemicals, although it will be limited to several thousand chemicals, and will be collected only once every five years – despite enormous documented variability in these chemicals’ production volumes that presumably reflects changes in their underlying use patterns.</p> <p>3. Differential access to both exposure data and the means to generate them severely limit the “reproducibility” of such data. In addition to the variability and absence of agreed-upon procedures noted above, other factors limit “reproducibility,” that is, the ability to readily and independently measure or verify exposure data. Most exposure data and the means to generate them reside virtually exclusively with industry. It must be acknowledged that industry has a strong interest in maintaining that exposure to its products is low, so the ability to independently measure and verify exposure data is critical. Yet physical access to many exposure “settings” (e.g., workplaces) is very limited and infrequent at best, even for government officials.</p> <p>Broader access to exposure-relevant information is even more restricted: Wide latitude is typically provided to claim chemical use and exposure information as CBI, preventing even its review outside government; this situation is often in contrast to that applying to hazard data, which is more likely to be deemed ineligible from designation as CBI.</p> <p>Finally, even chemical manufacturers have incomplete access to and information on their customers and how their chemicals are used. Intermediaries (vendors, brokers, distributors) are a formidable information flow bottleneck, as is the often-proprietary nature of information concerning downstream use and competition among suppliers. These factors serve to impede information-sharing even within supply chains, which in turn affects the extent and accuracy of exposure-relevant information that any one entity in a supply chain can provide if asked or required to do so.</p> <p>For all of these reasons, we believe that risk and exposure assessment at this time are simply too uncertain and unreliable to serve as a basis for deciding for which chemicals hazard data should be developed. While ultimate decisions concerning risk identification and management need to account for exposure as well as hazard, in all but the most exceptional cases, chemical prioritization approaches should be hazard-, not risk-driven.</p> <p>Difficulty of using exposure information in chemical priority-setting: OECD experience as a real-world example</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>The ongoing work of the OECD Existing Chemicals Program vividly illustrates the limitations to available exposure information – and to efforts to prioritize chemicals based on such information. In that program, chemical-by-chemical assessments of high-production volume (HPV) chemicals are conducted. Typically, industry collects existing information and conducts any testing needed to fill gaps in the required set of hazard information. Industry then prepares draft assessment documents, which are reviewed by health and environmental agency officials in member countries. While the primary emphasis is on hazard assessment, program procedures currently allow for exposure information to be included to “place the hazard information into context.” As we have documented in detail elsewhere, in practice this exposure information is routinely being used to decide that chemicals that have been identified as possessing clearly hazardous properties are nevertheless low priorities for further work based on “anticipated low exposure.” Unfortunately, the exposure information typically being relied upon has truly massive deficiencies with respect to scope, quality and completeness. Such information typically is:</p> <ul style="list-style-type: none"> • very limited in scope, and hence incomplete or even haphazard in its coverage of potential exposures, because it: <ul style="list-style-type: none"> - covers only a portion of known production and use; - covers only a subset of relevant activities, e.g., production, transport, storage, processing, use by customers, use in consumer products, product disposal, waste management; - covers only a subset of exposed entities, e.g., workers, consumers, the general population, sensitive populations, and wildlife; - addresses only a subset of relevant routes of exposure, e.g., by inhalation, ingestion or dermal contact; through food, water, air; - rarely is based on ongoing or sufficiently frequent measurement to address variation or changing conditions; • unverified, unpublished, rarely peer-reviewed and of uncertain or undetermined quality; • frequently based on judgment or speculation, rather than on actual measurements, monitoring or validated methods of exposure modeling. <p>Some of these deficiencies are related to the limited requirements under the program governing what exposure information is to be provided. However, others reflect the fundamental characteristics of exposure information described in the first section of this paper, as well as limitations on the extent and quality of information actually available and the capacity for effective review, and the lack of agreed-upon measures of scope, quality and completeness. The OECD Existing Chemicals Program has wrestled repeatedly with this problem over its history. Indeed, because of what many saw as an over-reliance on exposure-related considerations in the absence of an agreed-upon approach, the program went through a major refocusing to return to a primary focus on hazard characteristics as the primary driver for the program. However, despite the refocusing effort, inconsistent and insufficient exposure-related information – more than any other factor – drives the recommendation process for chemicals being assessed through the program.</p> <p>Implications for risk and exposure assessment policy</p> <p>All of the factors discussed above mean that assembling a complete and reliable exposure picture even for a single point in time faces obstacles and has proven exceedingly difficult in practice. So how should risk and exposure assessment policies – and practices – address these current realities?</p> <p>Guidelines development: We continue to strongly support the development of comprehensive guidelines for collection, analysis, validation and presentation of exposure information, as the much-needed foundation of any exposure assessment policy and practice. In our view, the OECD program needs to invest at least the same effort in developing a process for exposure assessment as was invested in developing the hazard screening program. There remain a number of substantial obstacles that must be solved in order to ensure that adequately robust data on exposure can be gathered.</p> <p>Resolving these challenges will not be easy. These obstacles include:</p> <ul style="list-style-type: none"> • lack of agreement as to what exposure information is relevant and needed; • lack of consensus as to the framework and methodologies needed to conduct an exposure assessment; • limited availability of and access to internationally accepted, comprehensive measured exposure information or models for predicting exposure; and • limited information available on all uses and other exposure pathways of chemicals. <p>Guidelines need to ensure that the measured and modeled or estimated data address and are representative of the full range of actual and potential</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>exposures that can or do occur. Procedures are needed to govern, for example, the minimum number of samples, the frequency of sampling, and other parameters so as to ensure that the results of any exposure measurements are both statistically meaningful and representative of the spatial and temporal variations present in the sampled environment. Quality assurance/quality control procedures to ensure data quality are needed. Where data are available for only a subset of production sites/release points/exposure sources, procedures are needed to determine whether and if so how extrapolations from available data can be used to characterize exposures arising from the missing sources.</p> <p>Adequate expert review: Policies need to provide for thorough review of exposure information. This starts with ensuring exposure-related expertise among reviewers is sufficiently diverse to address each of the various relevant exposure settings (workplace, consumer, environmental), and data generated through direct measurement as well as modeling. The review process should yield an explicit assessment of the scope, completeness and quality of the exposure information, in which any conclusions are qualified to accurately reflect the actual extent and nature of exposure information provided and hence the degree of associated uncertainty. Specific factors to be assessed should include:</p> <ul style="list-style-type: none"> • Scope and Completeness: geographic, temporal extent of applicability and associated limitations; to what fraction of total production and use, to what uses, and to which specific facilities, processes, activities and products the provided information applies; which activities associated with the chemical's full lifecycle (production, processing, storage, transport, use and disposal) are covered; whether information on releases and exposures relate to workers, consumers, public or the environment; whether information is based on measurements, modeling, judgment, extrapolation. • Quality: extent of documentation provided/cited; reference to/description of procedures used; representativeness of sampling underlying any measured data; validation of any model used; peer review and extent of access to underlying data; assignment of measures of reliability; reproducibility. <p>Accounting for the variable nature of exposure: Policies need to acknowledge and account for the inherent variability in exposure over time as well as space. For example:</p> <ul style="list-style-type: none"> • For new chemicals, the nature or extent of production, use and exposure needs to be tracked and revisited/reassessed over time, not only as a chemical enters commerce but as its production level and range of uses change. During the initial review/approval process, conditions should be included that require reporting of any changes in the nature and extent of production and use and other exposure-relevant factors, and such reports should trigger a reassessment of exposure potential. • For existing chemicals, policies should also be responsive to changes in the production level or use profile of a chemical. One recent illustration of this need in the U.S. is the change that has accompanied the phase-out of pentabromodiphenyl ether and its replacement with a different chemical, the production and use of which has increased dramatically as a result. <p>Data verification and model validation: To the extent data from industry are relied on, policies need to incorporate mechanisms to ensure and demonstrate that such data are accurate and representative, and wherever possible, to be able to independently verify such data.</p> <p>To the extent that modeled as opposed to measured data are relied on to provide exposure estimates, policies need to outline procedures to be employed to validate the models, provide public access to the models and their underlying data sets. Just as for measured data, policies also need to ensure that models effectively account for variation in exposure over time.</p> <p>Differential access: The differential access to exposure-related information (as discussed above) is a serious barrier to public confidence in both industry- and government-derived exposure assessment. In addition to adopting and abiding by comprehensive guidelines covering all aspects of exposure assessment, government needs to develop and implement mechanisms to demonstrate that it can independently verify the reliability of industry-generated exposure information; and industry needs to be encouraged or required to implement its own measures to increase confidence in the information it provides, including routine third-party review and a commitment to make information public whether exculpatory or not.</p> <p>In addition, policies need to consider means to break through the supply-chain bottlenecks that effectively prevent development of a full understanding of chemical processing and use. In our view, one of the key innovations offered by the European Union's REACH regulation is its intent to compel information-sharing up and down the chemical supply chain.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Finally, in our view, serious reconsideration of the currently overbroad broad allowances for CBI claims related to exposure-relevant information is warranted.</p> <p>Transparency: Policies should ensure that any descriptions of exposure information are clear and transparent in describing the scope and nature of the information and its limitations, including by addressing all of the elements specified above under Scope and Completeness and Quality.</p> <p>Policies should require that conclusions or recommendations be carefully written and explicitly qualified so as to limit their perceived and actual applicability to those settings for which information has been provided and deemed sufficient to warrant the conclusion or recommendation. Furthermore, the degree of uncertainty associated with a conclusion or recommendation should be stated and should reflect the extent of exposure information available. Lastly, policies should ensure that in the absence of good exposure information, exposure should be assumed possible or likely.</p> <p>Additional challenges</p> <p>Cumulative and aggregate exposures: A common limitation of exposure assessments in practice is to examine exposures only to single chemicals at single points in time, or from single sources or products, as if they occur in isolation from other exposures that are in fact relevant to understanding the true nature and magnitude of exposure. While understandable given the complexity involved in going further, this frequent failure to consider or even acknowledge the need to ultimately examine cumulative and aggregate exposures undermines the credibility of an exposure assessment. Policies, therefore, need to ensure that an accurate context is provided within which to judge a particular exposure assessment, one that accounts for factors such as:</p> <ul style="list-style-type: none"> • production, processing and use of the same chemical by multiple entities; • multiple uses of the chemical leading to actual or potential exposures; • multiple routes of exposure (direct, indirect) to a chemical; • continuous or periodic release of or exposure to a chemical; and • exposure to multiple chemicals producing the same/similar effects and/or acting by the same/similar mechanism(s) <p>Biomonitoring/environmental monitoring/health tracking: The ultimate arbiter of the value of exposure assessment is the extent to which its findings comport with reality. It is relatively rare for extensive data from actual environmental and biomonitoring to be available, and rarer still for health tracking statistics to be available that can be linked to particular exposures. Nonetheless, exposure assessment policies should ensure that such data are examined and incorporated where available, and should encourage the development of and public access to such data.</p> <p>Susceptible subpopulations: In addition to variation over time and space, exposure to a chemical or the effects arising from such exposure may differ among particular subsets of human or ecological populations. This variation may be due any number of factors, such as inherent differences in the subpopulations themselves (e.g., children's respiratory rates are higher than those of adults), differences with respect to proximity to, or reliance on activities associated with, particular sources of exposure (e.g., occupational exposure, dependence on a diet high in fish or groundwater as a drinking water source), or differences in sensitivity to a substance (e.g., sensitization, genetic susceptibilities). (Less understood at present are the analogous differences in ecological subpopulations.) Policies need to account for such variations and ensure protection of the most susceptible and sensitive sectors of potential exposed populations.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-253	<p>The Dose –Response Principle is Key to a Science-Based Program The Dose –Response Principle is Key to a Science-Based Program</p> <p>To protect public health and the environment, Cal-EPA needs to assure that the approaches under consideration within California are science-based and follow the dose-response principle. The principle of dose response underlies the scientific practice of pharmacology, and is the foundation of clinical therapeutics. However this principle, which is used to determine appropriate dosages and regimens for administration of therapeutic chemicals (pharmaceuticals), is also integral to the mechanisms through which chemicals of all kinds (pharmaceuticals as well as industrial chemicals) produce the unwanted effects, also known as toxicity. The dose-response principle stipulates that there is a direct relationship between the amount of exposure to a chemical and the level of response, regardless of the response being evaluated. Therefore dose-response is a principle that underpins both the science of pharmacology (therapeutic response) and toxicology (unwanted response). Most importantly, and often overlooked by scientists without pharmacology and/or toxicology backgrounds, is that there is a dose level below which no response occurs. Although there are some who suggest that any degree of exposure to a chemical affords unreasonable risk, this assertion is without scientific basis and in fact is just plain wrong. In fact, such assertions border on irresponsibility. In any science-based program dealing with chemical exposure, consideration of toxicity must be accompanied by an evaluation of the circumstances of exposure (the dose).</p> <p>Illustration of Dose-Response Principle</p> <p>The principles of dose-response are easily illustrated. Let’s consider a chemical for which it has been proven that: 1) repeated chronic exposure to high doses of the chemical causes cancer in humans; 2) acute exposure to high doses of the chemical over a short period of time causes neurotoxicity in humans; and 3) exposing women to sufficient doses during pregnancy causes a developmental syndrome characterized by mental retardation and birth defects. Now, let’s ask the question: Should this substance be considered “toxic to humans at any exposure level? Also: Would this substance be considered to pose a threat for “causing cancer or developmental toxicity” to humans at any level of exposure, no matter how minute? Should this substance be “banned”? If we know that this chemical is present commonly in food at a concentration of about 5000 ppm, would exposure to this chemical pose a concern for inducing cancer or neurotoxicity? We may also want to ask about concern for cancer or neurotoxicity when foods containing the chemical are consumed by school aged children day in and day out. Would that pose an “unacceptable hazard or risk”? Would there be a risk of developmental toxicity in fetuses exposed to this chemical in the womb when their mothers ingest 30 grams of a food containing this chemical, one to three times a day, and the chemical is present at concentration of from 3000 to 5000 ppm?</p> <p>If a hazard-based approach, where any exposure would be considered unacceptable, is used to answer these questions, it is likely that one would answer “yes” to all of the questions above. But, using the science-based principles of toxicology and dose-response, the answer will be no. Why? Because knowledge about the toxicity of a substance at high doses, under specific conditions of exposure, is insufficient, by itself, to determine what the potential health risks will be to humans under other conditions of exposure. Dose-response principles dictate that if exposure is maintained below a “threshold” concentration in a tissue that is the target for toxicity, no toxic effects will be manifested. This principle applies to all chemicals, both natural and synthetic. In this case, the “threshold” concentration is that dose that is necessary for toxicity to occur.</p> <p>Illustration Revealed</p> <p>So what is the chemical being referred to above? It is ethanol. Certainly abuse of alcoholic beverages chronically (high, repeated exposures over years) can cause cancer, and clearly drinking alcohol during pregnancy places the developing fetus at risk of fetal alcohol syndrome. Yet, there is no risk of developing cancer or birth defects from eating two slices of bread a day, day in and day out, even though the ethanol content in bread has been shown to range from 400 to 10,000 ppm (Logan and Distefano 1998) . Nor is there a risk of developing ethanol-induced cancer or birth defects from ingesting fruits or fruit juices, even though fruits commonly contain ethanol at concentrations ranging from 60 to 900 ppm while fruit juice (e.g., apple juice) can contain up to 5000 ppm ethanol.</p> <p>The Dose-Response Principle –the Scientific Basis for Chemical Management</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Clearly, it is not the chemical per se that poses the risk, it is the chemical within the context of dose, where the magnitude, frequency and duration of exposure, as well as the lifestage and susceptibility of the exposed individual, determine whether the chemical poses a potential risk to human health. In the case of human drugs used to treat disease, to see efficacy, a critical concentration of the drug at the target site is needed. The same principle applies to toxicity -- effects at high doses will not be realized at lower doses if the concentration falls below the target site threshold level. If the dose-response paradigm is rejected, then for therapeutic agents "cures" would be predicted to be triggered by any dose of a therapeutic agent. However, evidence-based medical practice rejects such homeopathic beliefs. Similarly, by analogy, hazard-only based chemical regulatory approaches should be considered as belonging in the realm of "homeopathy" rather than evidence-based toxicology and epidemiology. It is only the consideration of toxicity in combination with dose-response and the level of exposure that provides the scientific basis for risk-based chemical management approaches.</p> <p>Laura M. Plunkett, Ph.D., DABT Integrative Biostrategies LLC</p>
F-TD-254	<p>Very informative. Surely dose/response considerations should be key to any government actions. If such risk factors are not evaluated, then it is easy for the total effect of government action to result in a less healthy instead of a more healthy California and world. When unnecessary costs and limitations are imposed, resources are squandered. These resources are then unavailable for something that would make a big health difference. The ethanol example would work with salt and many other substances.</p>
F-TD-255	<p>Director Environmental Sustainability Programs Ecolab Inc. supports science and risk-based chemical management policies that balance the 'triple bottom line' of sustainability: protection of the environment, assurance of product safety and promotion of innovation in the marketplace. Ecolab encourages the members of the California 'green' committees in the following specifics:</p> <ul style="list-style-type: none"> • Understand both the burdens and benefits of new regulatory proposals. • Find a way to successfully manage both toxicity and exposure (i.e., risk) while providing the solutions California needs. • Utilize risk assessment methods that integrate knowledge regarding potential hazards of chemicals with an understanding of their uses and exposures. • Look for product stewardship and risk management programs that establish mechanisms to assure exposures remain in the safe region for typical uses and foreseeable misuses; and • Enact laws and regulations that: <ul style="list-style-type: none"> • are science-based, • balance potential risks with benefits, • factor in existing scientific knowledge as well as reasonable uncertainties, and • consider the degree of risk to people and the environment." <p>We encourage California to study the availability of data now, particularly the availability of both hazard and exposure data, so that risk determinations can drive decision making. Please coordinate information needs with other governments and other sources of information. Do not reinvent the wheel. Ecolab is in the process of evaluating products/services to evaluate the 'greenness' and 'sustainability' of our products. One of the companies we have evaluated is Chemical Compliance Systems, Inc. (CCS) which specializes in ecological, health and safety compliance, chemical security, and hazardous material management services. CCS has a database containing 220,000 chemicals and more than 75,000,000 data elements comprising 43 key environmental metrics. I first became aware of CCS on June 28, 2007 when I heard Dr. George R. Thompson, President & CEO, giving a presentation called "Web-based Databases That Facilitate Chemical, Product and Process "Green" Assessments and Automated "Green" Cleaning Product</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Development or Acquisition Assessments” at the 2007 Green Chemistry & Engineering Conference, Washington DC (www.GCandE.org) For products we submitted to them, they organized the results in three categories Ecology, Human Health and Safety in their default product 'report card' which weighs constituent chemicals and their percentages in the formulation. They evaluated and produced 'report cards' on both concentrates and ready-to-use solutions on a number of our products, showing the sensitivity of their approach. The following procedure was used to produce each report card. For each metric, the chemical that is least sustainable/green is given a score zero and the most sustainable/green is assigned 100. The scores in between are normalized so that each chemical (all 220,000) has a quantitative normalized score. They also have a Cross-Reference Dictionary & Regulatory Lists. The Chemical Cross Reference Dictionary contains 550,000 records of purified CAS numbers and their associated synonyms. This file facilitates accurate and complete materials management data searches and product substitution research. The Regulatory List of Lists file is comprised of over 650 international, federal, state and local regulated chemical lists and their associated data, as well as numerous CCS compiled lists (e.g., incompatible chemicals, hazard classes, etc.). CCS' modules compare a single chemical inventory file against these lists and generate a multitude of regulatory reports utilized by logistics, environmental/safety/ health, and chemical security professionals, as well as first responders. I strongly recommend California evaluate CCS's capabilities for application as part of California's Green Chemistry Initiative. I believe California's efforts will benefit from use of CCS's capabilities.</p>
F-TD-256	<p>Risk-Based Evaluation – the One Approach that Makes Sense Chemistry has enabled the development of countless products that consumers use each and every day, and consumers want to understand what impact these products may have on the environment and on their health. Industry shares this desire, and continues to strive to develop, produce and market products that are both beneficial and safe for people and the environment. Given the complex and multifaceted technical, societal and policy elements that are inherent in the design, manufacture, use and disposal of these products, one must consider a number of factors to effectively assure their safety. Approaches to safety that are performance based and flexible will provide the greatest benefits and allow the development of innovative approaches within the context of California's Green Chemistry Initiative. Industry works to minimize exposure of workers and the public to all chemicals that could be considered hazardous as used, and we pay particular attention to chemicals considered to be hazardous to humans or the environment. At the same time, industry uses chemicals that are least hazardous, and thus require the least expense in worker and public safeguards, consistent with the production of effective and economically accessible products. The two halves of risk--hazard and exposure--are always part of our planning and never far from our minds. Approaches that utilize risk-based evaluations of chemicals to determine efficacy and safety should serve as the foundation for decision making within programs that flow from the California Green Chemistry Initiative. While the toxicity of a substance is an important consideration in a risk based evaluation, the potential for toxicity must be considered in the context of exposure--including exposure level, route, duration and timing. Every substance can produce toxicity under certain exposure conditions. Even commonplace substances usually thought of as benign, such as water and table salt, can cause death when ingested at too high a dose over short periods of time. Conversely, even the most toxic substances pose virtually no risk when releases are controlled and exposures are minimized to levels below which, given an adequate margin of safety afforded by risk assessment techniques, the doses will not elicit adverse effects. For example, arsine gas is used to make microcontroller and microprocessor chips, and although arsine gas is highly toxic when inhaled, its "presence" in semiconductor chips in products used in every day life--computers, calculators, appliance microprocessors--poses no health hazards or risks from in-home normal and customary uses. So the question is not just, "How do we control toxic substances?", but also how do we successfully manage both toxicity and exposure--risk--while providing the solutions society needs? The answers to these questions are best provided through:</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>1) Risk assessment methods that integrate knowledge regarding potential hazards of chemicals with an understanding of their uses and exposures;</p> <p>2) Product stewardship and risk management programs that establish mechanisms to assure exposures remain in the safe region for typical uses and foreseeable misuses; and</p> <p>3) Laws and regulations that:</p> <ul style="list-style-type: none"> • are science-based, • balance potential risks with benefits, • factor in existing scientific knowledge as well as reasonable uncertainties, and • consider the degree of risk to people and the environment.
F-TD-257	<p>Quantitative Assessments of “Green” Munitions and Chemicals of Concern</p> <p>For many years, the Department of Defense (DOD) has made a concerted effort to reduce the potential impact of munition constituent and other chemicals on human health and the environment. In 2000, the U.S. Army Defense Ammunition Center (DAC) began working with Chemical Compliance Systems, Inc. (CCS) to use CCS’s extensive centralized Relational Chemical and Product Databases as the basis for a series of integrated, web-based modules within what has become the Munitions Analytical Compliance Suite (MACS). (CCS’s centralized databases included over 650 regulatory lists.) MACS includes eight modules. In a few months, the 9th and 10th automated modules the Emissions Risk Assessment and Human Health Risk Assessment—will be added. The most comprehensive of the MACS modules is the “Green” Munitions Analytical Compliance System (G-MACS). CCS developed G-MACS for DAC and PEO Ammunition Office in 2003. DAC and CCS co-own G-MACS, which has been available to 13 military munitions demilitarization facilities and two munitions management offices from coast to coast since its development. Military munitions design engineers can use the G-MACS’s 43 quantitative ecological, health and safety criteria (Endpoint Criteria) to eliminate or reduce the use of hazardous munitions constituents to create a theoretical munition composition that substitutes alternative components, parts or chemicals, and calculates the “green” grade for the total, component, or part composition in 5 to 20 seconds. G-MACS can also quickly identify which munition constituents have an impact on any of 112 state, federal or international regulations. This electronic design capability greatly reduces the labor and time required to design a “greener” munition. G-MACS also has application to other munitions activities (e.g., acquisition handling, demilitarization). Using a munition’s National Stock Number (NSN), G-MACS can calculate a munition’s overall “green” grade, its ecological, health and safety scores, and the 43 Endpoint Criteria scores within five to 10 seconds. Because all scores are normalized on a scale from 0 (worst) to 100 (best), comparisons of the “greenness” of two (or more) munitions is easy and quantitative. The evaluator can view individual scores, from worst to best, as a means to determine those constituents that need to be replaced to improve the “green” grade.</p> <p>When G-MACS is combined with CCS’s proprietary “Green” Process Analytical Compliance System (G-PACS) the four stages of a product life cycle (i.e., design; manufacture; stockpile management [e.g., handling, transportation, storage]; and disposal) can be evaluated. G-PACS uses the same 43 Endpoint Criteria as G-MACS, but analyzes the chemicals used in each step of the manufacturing process, or wastestream, rather than the constituents used in a munition.</p> <p>The MACS Chemicals of Concern (MACS-COC) module combines the objective and quantitative 43 Endpoint Criteria with quantitative Regulatory Impact and Inventory On-Hand Criteria to calculate a ranked Level of Concern listing for any facility’s inventory. This prioritized list can be beneficial in decision making, particularly in regard to inventory management, pollution prevention, and cleanup.</p> <p>I strongly recommend California evaluate CCS’s capabilities for application as part of California’s Green Chemistry Initiative. I believe California’s efforts will benefit from use of CCS’s capabilities. CCS’s web-based capabilities, their innovative approach, and their willingness to develop new or modified, integrated capabilities has proven beneficial to the Army’s efforts to both be good stewards of the environment and to implement its sustainability</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>program. Although I have not used them, I am aware of CCS's non-munitions capabilities, and believe that they would prove to provide tools of value to the civilian community and decision makers.</p>
F-TD-258	<p>Addressing the Data Gaps Is more data always better when it comes to understanding chemical safety? In many cases, the answer is yes, but when making this determination, it is important to understand the difference between a "data gap" and a "data need." WHAT DATA IS NEEDED? The U.S. EPA has clearly distinguished "data gaps" from "data needs" in the past. Data gaps are areas that could benefit from additional data, additional analyses, or clearer presentation, while "data needs" are data gaps requiring additional work before the potential risks can be adequately characterized – an important distinction to keep in mind. As was discussed at OEHHA's October 1 – 2 workshop on "Practical Decision-Making Tools," there are many models, tools, and guidance on structure-activity relationships to provide California with a tremendous amount of knowledge about chemicals without performing direct testing. The Canadian chemical prioritization under its Environmental Protection Act (CEPA) discussed at length in the workshop made extensive use of such modeling. The oft-touted EU REACH system initially proposed broad new testing mandates, but in its final version, the regulation backed away from that in deference to concerns over animal welfare. Sound scientific decision-making does not require the blunt approach of mindless box checking that only serves to require unnecessary data and animal testing, and burdens already strained public and private resources. Simply requiring unnecessary testing would only serve to put California seriously out-of-step with scientific consensus in the U.S., Europe, and the 30+ member countries of the Organization for Economic Co-operation and Development (OECD). WHAT CAN CALIFORNIA DO? 1. California should begin its assessment of information needs by first leveraging the information that already exists on chemicals. This includes accessing the information publicly available on High Production Volume (HPV) chemicals. Through the groundbreaking HPV Chemical Challenge Program, the OECD ICCA HPV program, and industry-led extensions of that work in the US, the chemical industry has already made and continues to make more information publicly available on more chemicals than any other voluntary or regulatory program globally. HPV chemicals in this program represent more than 95 percent of the U.S. market for commercial chemicals by volume. The information provided covers 17 endpoints internationally agreed by the OECD member countries as sufficient to initially assess chemical hazards including physical/chemical properties, environmental fate, ecotoxicity, and hazards to human health. Although this database is still being populated, there is a wealth of data and a solid platform from which the state of California can prioritize chemicals of interest, and evaluate further information needs. 2. Additionally, the HPV hazard data will be soon be supplemented with the information required by EPA's Inventory Update Rule. Specifically, in 2006 chemical manufacturers and importers of chemicals with site-specific annual production of 25,000 pounds or more were required to submit the following information for chemicals manufactured or imported in calendar year 2005:</p> <ul style="list-style-type: none"> • Basic company and facility site information • Chemical identify information • Specific chemical production volume • Chemical site limited status • Number of workers reasonably likely to be exposed to the chemical substance at the site of manufacture or import (in prescribed ranges); • Physical form(s) of the chemical substance as it leaves the submitter's possession, along with the associated percent production volume; and • Maximum concentration of the chemical substance as it leaves the submitter's possession (in prescribed ranges).

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>In addition, manufacturers and importers of chemicals with site-specific annual productions of 300,000 pounds or more were also required to provide the following production and use information:</p> <ul style="list-style-type: none"> • Application - North American Industrial Classification System ("NAICS") codes that best describe the industrial activities conducted by the sites that use or process the substance; • Industrial functions of the chemical substances; • Approximate number of processing and use sites; • Estimated number of workers reasonably likely to be exposed to each chemical substance at all sites at which the chemical is used or processed; • Commercial and consumer uses of reportable chemical substances <p>o An indication of whether the commercial/consumer products are intended for use by children;</p> <p>o Maximum concentration of the reportable chemical substance in each commercial and consumer product category; and</p> <ul style="list-style-type: none"> • Estimated percentages of the submitter's production volume in each industrial function category and commercial and consumer product category. <p>A compilation of the IUR information will be made publicly available by EPA sometime by the end of this year, and will provide the core of basic chemical "mapping" data discussed in recent Green Chemistry dialogues.</p> <p>3. California should also work now to understand how it can leverage the regional chemical cooperation program recently announced by Canada, Mexico and the United States under the Security and Prosperity Partnership (SPP). The SPP program will leverage the information Canada has produced under its Chemical Management Program, and the related CEPA priority-setting. In addition, the U.S. has committed that by 2012 it will assess and initiate any action necessary on more than 9,000 existing chemicals produced in the U.S. This will include both HPV chemicals and Moderate Production Volume (MPV) chemicals.</p> <p>WHERE CAN CALIFORNIA GET THIS DATA?</p> <p>Identified below are websites where California can obtain a significant amount of information on chemicals that already exists.</p> <p>The HPV Challenge data is available at:</p> <ul style="list-style-type: none"> • http://www.epa.gov/hpv/pubs/hpvrstp.htm <p>A more user-friendly version of the above referenced database is being built, and should be complete later in 2007. An initial version of that database is available now at:</p> <ul style="list-style-type: none"> • http://www.epa.gov/hpvis/metadata.html. <p>Recently, the chemical industry announced that it is extending its work on HPV chemicals - calling it the Extended HPV Program or EHPV. The EHPV Program broadens the original initiative by calling on companies to provide health and environmental information on 573 chemicals that have become HPV since the initiation of the Challenge Program, and increases the scope of information requested for all sponsored HPV chemicals by asking companies to provide use and exposure information. Information from this program will be submitted to the EPA over the next four years.</p> <p>Additional information is being generated under the Voluntary Children's Chemical Evaluation Program (VCCEP), in which USEPA evaluates both hazard and exposure information submitted by companies which have volunteered to determine potential effects on children's health. This information is publicly available at:</p> <ul style="list-style-type: none"> • http://www.epa.gov/chemrtk/vccep/index.htm <p>Beyond the databases for these voluntary programs, there are numerous other publicly available government databases. The Toxic Substances Control Act Test Submission database, TSCATS, is a central system for the collection, maintenance, and dissemination of information on unpublished technical reports submitted by industry to EPA under TSCA. Studies on over 8,000 chemicals are categorized into three broad subject areas (health effects, environmental effects, and environmental fate). Searches can be conducted using these subject areas as well as indexing terms.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<ul style="list-style-type: none"> • http://www.syrres.com/eSc/tscats_info.htm EPA and its Office of Research and Development maintain an electronic database called the Integrated Risk Information System (IRIS) and it contains descriptive and quantitative information on human health effects that may result from exposure to various chemicals in the environment. IRIS was initially developed for EPA staff in response to a growing demand for consistent information on chemical substances for use in risk assessments, decision-making and regulatory activities. Information in IRIS is intended for those without extensive training in toxicology, but with some knowledge of health sciences. The heart of the IRIS system is its collection of computer files covering individual chemicals. • http://www.epa.gov/iris/ The European Chemical Substance Information System (ESIS) is an electronic system that provides information on both new and existing substances in the EU. It includes proposed classification and labeling for 3,300 chemicals, information and data for roughly 2,500 EU HPV chemicals and final risk assessment reports for chemicals with completed assessments. • http://ecb.jrc.it/ESIS/ The EU's REACH legislation will eventually make available hazard data on all chemicals in the European market, as well as use-specific chemical risk assessments for chemicals on the European market above a specific threshold. Data will be publicly available, fully searchable, and formatted in software known as IUCLID. The International Council of Chemical Associations has committed to submit data and assessments for 1,000 global HPV chemicals to the 30 developed nations of the OECD for government assessment. To date, 667 chemicals have been assessed under the OECD program and work is continuing. OECD assessments are published as soon as they are completed on the OECD website. The data included in those assessments are also available, via the United Nations Environment Program (UNEP). • http://cs3-hq.oecd.org/scripts/hpv/ • http://www.chem.unep.ch/irptc/sids/OECDSIDS/sidspub.html The EXICHEM database is a pointer system on current, planned and completed activities on existing chemicals in OECD member countries and other relevant bodies. It was created to provide information for the OECD member countries on "who is doing what with which chemicals", (e.g. information gathering, testing, evaluation), in order to assist countries that are identifying opportunities for co-operation. • http://webdomino1.oecd.org/ehs/exichem.nsf The International Program on Chemical Safety (IPCS - a joint program of UNEP, ILO and WHO) developed INCHEM - a freely available collection of internationally peer-reviewed documents about chemicals and chemical safety. It was initiated in 2003 in response to priorities established by the Intergovernmental Forum on Chemical Safety (IFCS) and provides convenient worldwide full-text electronic access to chemical safety-related documents provided by intergovernmental organizations. All documents referenced by INCHEM contain hazard information and the site can be queried by key-words and free text. INCHEM contains Environmental Health Criteria documents, and cancer assessments by the International Agency for Research on Cancer. • http://www.inchem.org/
F-TD-259	<p>Innovation and Regulation</p> <p>Some of the suggestions posted in the Conversation with California appear to recommend that the State adopt a regulatory framework that would somehow coerce or command companies to innovate and develop "green" products or processes. The underlying assumptions seem to be that (1) the current system somehow stymies innovation and (2) forced regulation is the only way to bring about innovation. Unfortunately, neither of these assumptions are supported by the facts.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Let's look at the current U.S. chemical regulatory system and opportunities to bring new, better chemicals to market (a surrogate for measuring innovation). A comparison of the US system against the pre-REACH European system found that opportunities for the innovation were stifled for the European companies, not the US companies. European firms showed a lower economic performance, lower R&D productivity, lower patent productivity, lower number of polymer patents, and lower numbers of new chemical notifications (Fleisher, Manfred, Sabine Kelm, Deborah Palm. Regulation and Innovation in the Chemical Industry. Social Science Research Center Berlin. October 2000). Our current system allows companies to use the sophisticated techniques developed by EPA to assess potential risks for chemicals and incorporate the findings into future business decisions. Thus, far from being a barrier to innovation, the U.S. regulatory system confers some important benefits in the breadth and speed of technological progress. What about the second assumption that we need to regulate to force innovation? If "green" chemistry is to work, there must be inter-disciplinary collaboration among a variety of experts in chemistry, toxicology and environmental science that work in business, government and academia. No government can dictate precisely how this process for innovation and collaboration should occur. It will be unique for each circumstance. A one-size-fits-all regulatory framework will not only fail to bring about new innovation; it could, in fact, stifle ongoing innovative processes.</p> <p>In addition, stricter management controls (including bans) of existing chemicals provide no guarantee of "greener" outcomes, although this has been implied by others. Green chemistry explicitly identifies materials or processes that reduce health and environmental impact while maintaining or improving cost-effective performance. A regulatory action taken against an existing chemical may or may not be supported by a careful analysis of the health and environmental impact of substitute products or processes; and those substitutes may or may not provide cost-effective performance to meet the specific societal need. Unless such an analysis occurs, it is not clear that regulatory action improves health and environmental protection.</p> <p>The reality is many chemical companies are already addressing green chemistry objectives through their ongoing product stewardship work. Product stewardship is the practice of making health, safety and environmental protection an integral part of the full life cycle of chemical products. It includes evaluations of chemical products and their uses to help assure that those products deliver their intended benefits to society while protecting public health and the environment. As part of Responsible Care®, members of the American Chemistry Council employ a rigorous management system that is certified by third-party auditors. In addition to numerous other elements, those auditors verify that our companies have systems to manage risk associated with chemical products and that those systems include management of product development, transport, use and disposal in a safe and secure manner. Companies are also audited on their programs to protect the environment and conserve programs, as well as processes to dialogue with stakeholders about the organization's impact on human health and the environment. ACC member companies have a track record of bringing new, innovative products to market that address new societal needs, including health and environmental protection.</p> <p>In addition, shifting market expectations and liability regimes are already at work in instituting the increased attention to health and environmental effects. The market is already leading the way -- the risk of a government "meat-ax" could stifle that innovation in its tracks.</p> <p>ACC agrees that government can and should encourage the collaborations that can produce "green" chemistry, through mechanisms such as the sharing of expertise, financial support for research, information exchange and public education. In fact, a variety of federal agencies (including EPA and DOE), the private sector, professional associations such as the American Chemical Society, Non-Governmental Organization (NGO) groups and universities are currently working together to encourage green chemistry strategies. The government can and has provided support for green chemistry outside the framework of TSCA. Those efforts can, of course, be enhanced further to improve U.S. leadership in the field.</p> <p>If the state of California truly wants to lead in green chemistry, it needs to be focused on encouraging innovations through incentives. The economic drag of yet more rules, regulations and restrictions will not foster the creation of new products or, more importantly, their development and diffusion across the economy.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-260	<p>Quantitative Web-based "Green" Munitions Analyses</p> <p>The United States Army Defense Ammunition Center (DAC) has partnered with Chemical Compliance Systems, Inc. (CCS) to develop munition analytical compliance capabilities for the past eight years. Along with other DOD organizations, in 2003, DAC contracted CCS to develop a tool that would assist the Army in efforts to assess munitions from a "green" perspective. What came out of this was a Web-based tool known as the "Green" Munitions Analytical Compliance System, or G-MACS. Since no green criteria had previously been established for munitions, or any other product, the development of G-MACS by CCS with 43 ecological health and safety "green" criteria made a giant step forward in helping our design and manufacturing installations with an automated capability to assess the "greenness" of munition constituents early in the life cycle. The "green" scoring criteria in G-MACS was programmed to be flexible and dynamic enough to be modified as needed to support any environmental factors and/or guidelines on "greenness" that might be developed. G-MACS is unique in that it can, in combination with the CCS "Green" Process Analytical Compliance System (G-PACS), be used to "score" a munition for "greenness" throughout the life cycle (cradle to cradle). G-MACS, along with other CCS systems such as their "Green" Product Compliance Analytical System (GP-CAS), and "Green" Process Analytical Compliance System (G-PACS), could be utilized to provide a complete life cycle "green" product measuring tool that not only covers munition constituents but also, paints, pharmaceuticals, cleaning products, pure chemicals, etc. After a number of years of working with CCS and knowing the tools that they developed such as MACS and G-MACS, DAC is confident that the State of California could benefit by utilizing CCS and their GP-CAS, G-PACS and G-MACS Web-based tools.</p>
F-TD-261	<p>Green Chemistry & Product Stewardship</p> <p>The California Green Chemistry Initiative is defined by DTSC as an effort to stimulate a "transformation in the design of products and processes." Interestingly, DTSC's leading recommendation for bloggers ("...Consider public health and the environmental effects of chemicals during the process of designing products and industrial processes...") could have been lifted directly from the American Chemistry Council's Responsible Care® product stewardship program – a program which has been in place since 1991, more than 15 years before California's initiative. All members of the American Chemistry Council, which represents the leading companies engaged in the business of chemistry, participate in Responsible Care® as a requirement of membership in ACC.</p> <p>"Green chemistry" is product stewardship done right. It is the practice of making health, safety and environmental protection an integral part of the full life cycle of chemical products, including design and manufacture. Under Responsible Care®, this includes evaluations of chemical products and their uses to help assure that those products deliver their intended benefits to society while protecting public health and the environment. Responsible Care® requires our members to employ rigorous management systems that are certified by third-party auditors. In addition to numerous other elements, those auditors certify that our companies have systems to manage risk associated with chemical products and that those systems include management of product development, transport, use and disposal in a safe and secure manner. Companies are also audited on their programs to protect the environment and conserve programs, as well as processes to dialogue with stakeholders about the organization's impact on human health and the environment. Companies' performance under Responsible Care® is publicly shared with the public through a first-of-its-kind website: americanchemistry/responsiblecare.com.</p> <p>Reducing hazardous materials in products and processes is also simply good business sense. Hazardous materials cost companies money in additional storage, transportation and disposal fees, as well as additional cost for protecting their work force through engineering controls and personal protective equipment.</p> <p>DTSC and the public can obtain more information on what the chemical industry has been doing in the Responsible Care® program from http://www.responsiblecaretoolkit.com.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>It's critical that DTSC's recommendations to CalEPA in the Green Chemistry Initiative recognize the value and role of industry stewardship programs, and create incentives for others to take similar steps. This is particularly true through the entire value chain, up to and including end users of chemicals and the products made from chemistry.</p>
F-TD-262	<p>Info on federal legislation on Green Chemistry from Chemistry and Engineering News, 9/17</p> <p>HOUSE SUPPORTS GREEN CHEMISTRY</p> <p>POLICY: Bill aims to eliminate hazardous effects of chemical manufacturing</p> <p>THE HOUSE approved legislation by voice vote on Sept. 4 that would establish a federal interagency program and boost government funding for research into environmentally friendly alternatives to many traditional chemical products and manufacturing processes.</p> <p>"Preventing pollution and hazardous waste from the start of a design process is far preferable to cleaning up that pollution and waste at a later date," says Rep. Phil Gingrey (R-Ga.), chief sponsor of the Green Chemistry Research & Development Act of 2007 (H.R. 2850).</p> <p>The legislation establishes a program that promotes and coordinates green chemistry R&D activities within four federal science agencies. It authorizes a total of \$165 million in funding for R&D grants over the next three fiscal years, split among NSF, EPA, the National Institute of Standards & Technology, and the Department of Energy.</p> <p>The interagency program would support grants to</p> <p>VIRUS MAY BE CAUSE OF HONEYBEE LOSS</p> <p>ENTOMOLOGY: Chemical stressors may weaken bees' immunity, researchers suggest</p> <p>Researchers have buzzed with speculation about why U.S. honeybee colonies declined by an average of 30% last year. Now, researchers in academia, government, and industry report that a virus may be responsible for what has become known</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>as colony collapse disorder (CCD). The researchers underscore that they do not know the extent to which other suessors, including pesticide exposure, may be involved (Science, DOI: 10.1126/science.u46498). What's clear to scientists is that more research is needed to make a definitive link. "The work is a major breakthrough, but it's not a slam dunk," says ~lay R. Berenbaum, a professor ofentomology at the UniversityofIllinois, Urbana-Champaign. "But it certainly illustrates how complex this whole situation is."</p> <p>For the study, epidemiologist W. Ian Lipkin at Columbia University and colleagues collected bees from healthy and CCO-stricken hives in the U.S., as well as healthy bees from Australia. The research team evaluated the samples collected over three years \\with a rapid genome-sequencing technique called pyrosequencing. individual researchers, university/industry partnerships, R&D and technology transfer at federallaboratories, and the education and training ofstudents in green chemistry and chemical engineering.</p> <p>The House passed similar legislation in 2004and again ,in 2006, butboth measures died when the Senate failed to act. "1 hope the third time ""in truly be the chann for thiS bill because the SOOnerweenact greenchemistry legislation, the sooner companies across America can utilize this. innovative development," Gingreysays.</p> <p>The initiative has received endorsement from the chemical, phannaceutical, and biotechnology industries, as well as the American Chemical Society. "Green chemist!)' is the ultimate proof that environmental and economic benefits in chemistry can be optimized simultaneously," ACS President Catherine T. Hunt says.</p> <p>"The technologies that spinout ofthis novel research are the seeds that can sustain small-business ventures and green corporate practices.</p> <p>"From reducing and impro\\ving pharmaceutical processes to reinventing the home and construction business to overcoming our climate and energy challenges,</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>green chemistry is proving that economics and environment are not mutually-exclusive," Hunt adds. There is no companion Senate legislation yet, but an aide to Rep. Gingrey says Sen. Olympia J. Snowe (RMaine) has expressed an interest in sponsoring a green chemistry measure. -GLENN HESS</p> <p>The results revealed genetic sequences that suggest the presence of a virus; upon further examination, the researchers found that the sequences are most closely related to those of Israeli acute paralysis virus (IAPV), first described in Israel in 2004. Bees in Israel infected with this virus had a shivering, stinging condition and died near the hive. In the U.S., however, bees have simply disappeared and are presumed dead.</p> <p>"At this point, we do not have a cause-and-effect relationship with IAPV and CCO," says coauthor Jeffery S. Pettis, research leader of the U.S. Department of Agriculture's Bee Research Laboratory. Parasites such as the varroa mite are known to suppress bees' immune systems. The authors suggest that a variation in the virus strain, coinfection with another virus, poor nutrition, or interaction with pesticides may also explain the symptomatic differences.</p> <p>Chemical pesticides could act as a potential trigger for the viral infection, and preliminary data from other studies show that some classes of pesticides may lead to the amplification of specific viruses, says lead author Diana L. Cox-Foster, an entomologist at Pennsylvania State University. -RACHEL PETKEWICH</p> <p>-</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>Gingrey Hunt Parasitic van-oo mites (one visible on top of bee) can make honeybees more susceptible to infectious agents, including viruses. WWW.CEN- IINE.ORG 9 SEPTEMBER 10.2007</p>
F-TD-263	<p>ACC's Perspectives on California's Green Chemistry Initiative The business of American chemistry is built on fundamental science. As a result, the members of the American Chemistry Council (ACC) support science and risk based chemical management policies that simultaneously protect health and the environment, assure product safety and promote innovation in the marketplace. Our industry has always relied upon innovation in its development of products and processes to meet customer needs and expectations, address new regulatory requirements, and to fulfill voluntary commitments to programs that go beyond the law. It's important to note that "Green Chemistry" is a way of doing business was never intended to be applied as a government mandate through regulation or legislation. Indeed, the American Chemical Society's Green Chemistry Institute states: "Green Chemistry differs from previous approaches to many environmental issues. Rather than using regulatory restrictions, it unleashes the creativity and innovation of our scientists and engineers in designing and discovering the next generation of chemicals and materials so that they provide increased performance and increased value while meeting all goals to protect and enhance human health and the environment." So how should California approach green chemistry? We think there are a number of threshold issues DTSC must be prepared to address in making recommendations on the basis of this initiative:</p> <ol style="list-style-type: none"> 1. Make a baseline assessment of chemical information that is already available to the State. In ACC's view, there is a lot of information already publicly available on chemicals in commerce, and a lot more coming on line, from other States, the federal government, foreign governments, intergovernmental organizations, and even non-governmental organizations (including industry). DTSC should be studying the availability of data now, particularly the availability of both hazard and exposure data, so that risk determinations can drive decision making. It simply makes sense for California to coordinate on information needs with other governments and other sources of information – why reinvent the wheel? More importantly, DTSC doesn't have to wait until the end of its Green Chemistry Initiative to get the ball rolling on this important element. 2. Reiterate the commitment that the Green Chemistry Initiative will be governed by science. Many entries in the "Conversation with California" appear to be based on an underlying assumption that the current design of products and manufacturing processes is not adequately protective of health and the environment, and recommend that DTSC suggest hazard-based approaches to decision making. That's not good policy. As DTSC acknowledged in the launch of the Initiative, science should govern the process. Americans (and Californians) are living longer, healthier, and safer lives than ever before, and significant improvements have been made in public health and the environment. An extensive legal and regulatory framework, coupled with myriad voluntary programs, initiatives and innovations, has led to those advances in health and the environment. We hope that the Green Chemistry Initiative will examine the basis for the assumptions about the adequacy of current protective measures as policy options are identified. 3. Commit to understand both the burdens and benefits of new regulatory proposals. One University of California report on chemical regulation in California noted that businesses in California labor under a "labyrinth" of rules enforced by a number of agencies. Interestingly, many of the entries in the

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>“Conversation with California” argue that even more regulation is necessary! Some have referred to Europe’s new REACH regulation as the solution – taking the interesting position that a regulatory program that is not yet even operating is now a benchmark for chemical regulation.</p> <p>4. Acknowledge that engineering is a part of “green chemistry.” ACC member companies are leaders in green chemistry and green engineering in their operations and have been honored for their efforts. Modifications in process technology have significant potential to minimize possible adverse health or environmental effects of chemical substances. Many of the entries in the “Conversation with California” appear to focus largely on promoting product substitution – the simplistic substitution of one hazardous chemical for a less hazardous alternative – without regard to the consequences of such an approach, and without recognizing the important role that process improvements can have. It’s time DTSC made clear in this dialogue that engineering is every bit as important as product improvements.</p> <p>ACC and its member companies believe that the Conversation with California should address a number of the complex, specific issues that are implicated by the Initiative. In the weeks ahead, we intend to address issues like the role of product stewardship, the role of regulation in promoting innovation, how California might stimulate “green chemistry” and “green engineering”, and the four broad categories on which DTSC has invited specific comment.</p> <p>Mike Walls Managing Director, Regulatory and Technical Affairs American Chemistry Council</p>
F-TD-264	<p>Quantitative Green Ranking for All Chemicals</p> <p>A database has been created with over 220,000 chemicals (all listed to date) and all cross reference names with filters for all state and federal regulatory lists. Each chemical has assigned the 33 federal EPA Environmentally Preferred Characteristics (EPP) and additional credible Characteristics given by regulatory agencies CAL EPA, other key USA states and key countries totaling 41 key environmental performance characteristics (e.g. LD 50, excess lifetime cancer risk, flammability, health hazard indices etc). These characteristics may be organized into three categories Ecology, Human Health and Safety. This database, updated annually, contains over 75,000,000 elements to rank products as a function of the chemicals and chemical percentages.</p> <p>For each environmental characteristic, the chemical that is least compatible with living systems is given a score zero and the most compatible the score one hundred. The scores in between are normalized so that each chemical (all 220,000) has a quantitative normalized score.</p> <p>The navy tested eight adhesives meeting MIL-SPEC by providing the chemicals that make up the products. The chemicals were transmitted via the on-station web site database of products Hazardous Material Management System (HMMS) to Chemical Compliance System's (CCS; www.chemply.com) web site. A report of all 41 Environmental Characteristics was automatically generated, and with equal weights as the default mode, a normalized score for Ecology, Human Health and Safety and an overall Environmental Score (Green Rank Score to make the best decision for the environment).</p> <p>This tool may be used for face cream, road paint, military aircraft munitions or paint, any product with a list of chemicals and percentage created a true quantitative score.</p> <p>This tool may be utilized by academia, government, industry, householders, military etc to formulate-design and or determine the best products compatible with the ecology, human health and safety.</p> <p>The vision is that the state of California purchases the tool for the USA to be utilized for no cost by all so that the environmental may improve rapidly. This would become the biggest pollution prevention project ever and the most cost effective to reduce pollution through source reduction. The federal EPA may also participate. With this tool in place via a web site sponsored by CAL EPA and or FED EPA, the products most compatible with the ecology, human health and safety may be chosen by the consumer. Also, formulations by academia, the government, industry etc may be optimized for environmental compatibility. The user simply inputs the chemical makeup of a product and the web site generates a complete report of the EPA EPP</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>characteristics (and others from the key state and countries if desired) and a normalized score for the ecology, human health and safety and a total environmental score (green rank). This would be easy to put the information into a green label.</p> <p>Dr. George Thompson, PHD in Chemical Engineering developed this tool taking over 25 years for the DOD through a company www.chemply.com. The rest of the nation should benefit from this significant work.</p>
F-TD-265	<p>Require Legislation Require Legislation.</p>
F-TD-266	<p>As a resident of Mar Vista, west Los Angeles, my neighborhood is bombarded by people living near Santa Monica Airport who complain of the health hazards of jet fumes emanating from Adjacent Santa Monica Airport.</p> <p>There has been a lot of political agitation but no one seems to realize that this is a chemical engineering problem.</p> <p>What is needed is a point of sale jet fuel additive (ASTM 1655) that mitigates soot and fumes during jet aircraft ground operations.</p> <p>Ideally, any jet aircraft departing KSMO should be topped off with a fuel additive that inhibits soot and fumes.</p> <p>Any suggestions?</p>
F-TD-267	<p>Legislative Changes</p> <p>I have conducted research on safer alternatives for the last 30 years. Over the last 17 years, my organization, the Institute for Research and Technical Assistance (IRTA), has identified, tested, developed and demonstrated safer alternatives in a range of different applications and industries. Over that period, IRTA has assisted hundreds of facilities in California in adopting alternatives. IRTA has worked on alternatives in dry cleaning, repair and maintenance cleaning, handwipe cleaning, batch loaded cold cleaning, electronics cleaning, vapor degreasing, printing cleanup, paint stripping, coatings and adhesives. In some cases, whole industries have adopted alternatives developed and tested by IRTA.</p> <p>Over the course of this work, I have learned much about how the system works and have become aware that, in order to ensure that safer alternatives are used, legislative changes are required. First, California needs a California Toxic Substances Control Act (CAL TSCA). CAL TSCA would require all new chemicals sold into California to be tested for toxicity before they are marketed. A set of toxicity tests that would be required would be developed by a consensus group of toxicologists with input from DTSC and the public. The manufacturers or distributors would have to conduct these toxicity tests at their own expense. CAL TSCA would also establish a set of toxicity tests that would be required for existing chemicals, chemicals that are already being used and marketed in California. In a few cases, the toxicity test information would already be available; in other cases, the tests would have to be performed. When the toxicity test data were provided by the manufacturers or suppliers, DTSC, with the help of the Office of Environmental Health Hazard Assessment (OEHHA), would evaluate the results and decide whether the chemical could be marketed (new chemicals) or whether the chemical would have to be removed from the market (existing chemicals). The criteria for deciding on this up or down vote would be predetermined by the group of toxicologists who designed the tests and DTSC with public input.</p> <p>Many chemicals that have toxicity problems have come on the market in the last 10 years. These chemicals are used extensively and exposure of workers and community members is high. An example is n-propyl bromide (NPB). NPB is a reproductive toxin in animals and has also caused nerve damage. It is currently undergoing testing for carcinogenicity. When the chemical was first marketed, EPA did not require toxicity testing for the substance under Federal TSCA. The chemical has been listed on California's Proposition 65 but is not on the state toxics list. Cal/OSHA and Federal OSHA have not established worker exposure levels for the chemical. NPB is used in vapor degreasing. The dry cleaning industry is considering using it as a dry cleaning solvent and there is nothing that would prevent this. Once chemicals like NPB are on the market, there is no mechanism for preventing their use in dispersive applications. Adopting a CAL TSCA would allow the state to deal with chemicals like NPB.</p> <p>Second, OEHHA has the responsibility of determining whether chemicals pose an unacceptable risk and that agency has few resources. OEHHA's budget should be expanded substantially. Dry cleaners in the state have been using a dry cleaning solvent called D5 for several years and D5 has</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
	<p>caused cancer in laboratory animals. OEHHA has been evaluating toxicity test results to determine whether D5 is a threat but has not completed their analysis. In the meantime, no regulatory agency can regulate D5 and the dry cleaning industry is using it extensively. Giving OEHHA more resources could speed the evaluation process and give high priority to the new work the agency would be called upon to do under CAL TSCA.</p> <p>Third, the California Air Resources Board (CARB) is limited in their regulatory authority and their authority should be expanded. CARB regulates consumer products but is forbidden from regulating away a whole product type. In other words, if a low-VOC or low toxicity nonaerosol product is available and could substitute for a higher VOC more toxic aerosol product, CARB cannot regulate the VOC content or toxicity of the aerosol product on that basis. CARB can set a lower VOC limit or ban certain toxics in the aerosol product if there are other aerosol products with lower VOC content or no toxics. Aerosol products are inherently not green. They lead to a very large waste stream and they rely on propellants that are often VOCs or greenhouse gases. As an example, consider antiperspirants and deodorants. Roll on products have very low or no VOC content. In contrast, aerosol products have a higher VOC content and contain propellants that may be greenhouse gases or VOCs. Expanding CARB's authority would permit the agency to establish VOC and toxics limits based on the nonaerosol products. This would allow the state to forbid the use of aerosol products in cases where there are greener products. It would also allow CARB to forbid the use of certain toxics as determined under CAL TSCA as a threat.</p> <p>The three legislative suggestions described here would make it far easier to restrict the use of certain materials that cause problems for health and the environment. The strategy would provide an incentive for manufacturers and suppliers to find and market greener products. This would result in better protection of the health of consumers and workers and of the environment in California.</p>
F-TD-268	<p>Pharmaceuticals and Personal Care Products (PPCPs) Add PPCPs to your Green Chemistry Initiative.</p> <p>Legislative and regulatory action with respect to PPCPs can have large significant beneficial effects.</p> <p>With new analytical processes, the ubiquitous nature of PPCPs have been confirmed ((USGS study in 1999-2000). PPCPs are harmful to ecological systems at very low concentrations, causing feminization in fish (from estrogen in oral contraceptives) and delayed matamorphosis in amphibians (from anti-depressants). These observed effects are dramatic in themselves and ominous indicators of large uncontrolled threats to ecosystems. Effects on humans and long term effects on both humans and ecosystems have not been fully investigated.</p> <p>Some ideas:</p> <p>Mandatory take-back programs for pharmaceuticals, have been successful in Australia, where every pharmacy is required to take bck unused or outdated phramaceuticals.</p> <p>A voluntary take back program was recently very successful in the Bay Area. The Bay Area Pollution Prevention Group (BAPPG) in partnership with Walgreens collected 3,500 pounds of phraceuticals.</p> <p>PPCPs remain in soil and waste treatment effluent. Because the waste streams are continuous, this results in a pseudo-persistence of these contaminatns. Contaminated sludge is commonly applied to land. Ozonation (in waste treatment plants) is successful in degrading many PPCPs without toxic daughter products. Legislation to make ozonation mandatory would provide significant immediate benefits to ecosystems. Legislation should include a grant program to allow rapid upgrade of facilities and regular inspection/monitoring of both sludge and efflent.</p> <p>Partner with personal care product companies and distributors to identify and reduce harmful ingredients. Consider banning certain chemicals for use in California. Partner with European entities who have been working on this problem. Educate the public about risks in shampoo etc. Create legislation to include PPCPs</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (FORUM)	
Number	Full Comment
F-TD-269	<p>Lord Professor of Chemistry Regulate toxics out of products—stimulate Green Chemistry to find replacements where necessary.</p> <ul style="list-style-type: none"> • To regulate, emulate REACH and expand it in a CA leadership way based on understanding that comes from toxicity experts and especially EDC researchers. • In encouraging GC R&D, adhere to the Anastas/Warner principles inside projects and the Collins bookcase to prioritize projects for funding. • Develop and enact legally binding tests for EDCs, ASAP. • Make it easier to make money through GC—a key governmental role.
F-TD-270	<p>Worker health impacts should be part of cost-benefit decisions In addition to environmental and consumer impacts, potential adverse effects on worker health should be assessed and taken into consideration when evaluating product toxicity. This includes workers who manufacture the products as well as those who use it. Preventing the marketing of products with potential adverse impacts is an essential public health function.</p>
F-TD-271	<p>Avoid one size fits all approaches We all share an interest in promoting a balanced approach to this subject, meaning one that can advance health and safety without stifling economic growth. It is essential that any scheme takes into account both high volume chemicals and the nature of the uses (i.e. uses that create few pathways for exposure vs. ones that more easily enter the environment or come into contact with humans). Some industries, such as the semiconductor industry, rely upon specialty chemicals to enable key processes, but the chemicals are used in relatively small volumes. In addition, given the trend towards globalization, most technology companies are interested in producing products that can be sold and used anywhere in the world. That factor strongly suggests that California should conform its green chemistry scheme to other parts of the world so that local companies are not forced to understand and comply with California-only regulations.</p>
F-TD-272	<p>Senior Toxicologist, Office of Environmental Health Hazard Assessment Cal/EPA should consider the best practices identified in the April 2007 report entitled "Not that Innocent" A comparative analysis of Canadian, European Union, and United States Policies on Industrial Chemicals" by Richard Denison."</p>
F-TD-273	<p>California should certainly lead in this field. We are a California company that offer economically viable tools to do just this...</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-1	<p>American Chemical Society Response</p> <p>Cradle to Cradle: Through product design and industrial innovation, produce products that reduce the use of harmful chemicals, thus generating fewer emissions and less waste. How do you think California should move to a Cradle to Cradle framework?</p> <p>California needs to carefully review and identify with stakeholders the current significant barriers that impede investment in, and adoption of, sustainable technologies. Although the long-term economic benefits of sustainable technologies, such as reduced regulatory and waste disposal costs, can be significant, businesses can be placed at a near-term competitive disadvantage because of potentially prohibitive, up-front costs. Regulations need to be revised to allow flexibility for the superior environmental performance obtained when clean technologies are employed.</p> <p>To effectively address this dilemma, ACS believes that governments should provide incentives for the implementation of sustainable technologies, as explained further by our answer to the green chemistry question.</p>
F-TA-2	<p>Use of Existing Web-Based Tools to Certify "Green" Cleaning Products</p> <p>Industrial cleaning product constituent chemicals have a wide spectrum of potential effects on human health and the environment. Manufacturer employee, product user, and cleaned building resident exposures potentially encompass both acute and chronic health risks. Selected products and processes also manifest safety risks (e.g., fire, explosion, incompatibilities). Constituents may additionally pollute air, water and soil. Everyone gains when historic industrial and household cleaners are cost effectively replaced with "green" products and manufacturing processes that have passed quantitative, objective, and comprehensive assessments.</p> <p>Customization of the Chemical Compliance Systems, Inc. (CCS) "Green" Process Compliance Analytical System (G-PACS) and their "Green" Product Compliance Analytical System (GP-CAS) enables the Chlorine Free Products Association (CFPA) to utilize the "Green" Cleaning Product Process Analytical Compliance System (GCP-PACS) in conjunction with the third party accountability services of our Sustainable Manufacturing Initiative (SMI) on-site audits. Those facilities that complete the SMI with GCP-PACS are then offered access to the on-line, automated "Green" Cleaning Product Compliance Analytical System (GCP-CAS) to provide a complete, comprehensive, cleaning product assessment within 5-10 seconds. Both systems utilize over 40 ecological, health and safety criteria for each chemical constituent. The process, or product, is quantitatively rated on a scale of 0 (worst green) to 100 (best green) for easy manufacturing, or acquisition, assessment against pass/fail criteria, or comparison of competitor products. Compromising product hazards and offending constituents are also quantitatively identified. Both GCP-PACS and GCP-CAS include alternative constituent databases in their process/product Design modes that greatly streamline selection of less hazardous constituents to replace more harmful ingredients. This latter feature greatly facilitates "green" cleaning product and process research and development by rapidly calculating product, or process, "green" ratings as alternative constituents are theoretically inserted for compromising ingredients. Cleaning product or process constituent impacts on over 100 state, federal, international and other third party regulations are simultaneously assessed. GCP-CAS and GCP-PACS represent the first standardized, Web-based analytical compliance capabilities for quantitatively certifying the "greenness" of industrial cleaning products and processes by an independent third party. CFPA recommends that California consider these CCS capabilities as options for achieving the objectives of the California Green Chemistry Initiative.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-3	<p>Practical Issues for Identification and Management of Common Consumer Items by Public Agencies Public agencies purchase a wide range of promotional items in the same commercial marketplace that other consumers use, but as tax-supported entities, they are expected to practice a higher standard of safety for any items they make available to the public. The green chemistry initiative should deal with practical problems such as:</p> <ol style="list-style-type: none"> 1. Standards: Even pre- and post-production testing for Prop 65 compliance has proven inadequate to assure that items meet these standards, possibly due to variability in product composition, types of tests used or other, unknown factors. There are no clear voluntary or mandatory standards or methods for testing of most materials for most chemicals for most consumer items; the standard Material Safety Data Form provides occupational safety information but no clear information about the chemical content of the finished consumer product; few manufacturers provide independent verification of test results; and there appear to be few penalties and little self-policing of the voluntary standards that are in place. These system failures need to be addressed. 2. Indemnity: Once distributed, items found with contamination above reportable levels may immediately be classified as hazardous waste, thereby preventing the use of timely, efficient, and least costly means to recover and dispose of the contaminated items. If current law is prohibitive or unclear, then time periods should be established in statute/regulation within which agencies may recall/recover items. Alternatively, a "hold harmless" testing system should be established to enable agencies to test and recover items w/o fear of punitive regulatory action. 3. Responsible Purchasing: Purchasing guidelines or specifications, together with information and technical assistance, should be provided for public agencies to use with potential vendors so as to encourage and incent "clean" manufacturing practices. A public registry for companies with "clean" manufacturing, monitoring, disclosure, and business practices should be created; alternatively, a public source of information about recalls, litigation/regulatory action, and other concerns (as might be found in media reports) should be established to encourage informed purchasing. Laboratories capable of doing specialized testing should be certified, and their fees should be publicly available. Registration through C-MASS or other such mechanism should be considered. 4. Science as Driver: There is a growing science base about the public health impact of many chemicals, making the establishment of guidelines or standards a moving target. Proactive, science-driven processes free of commercial concerns and reporting/monitoring systems for both the public and for business purposes are needed as a foundation for reviewing and updating the evidence that is available to inform the development and updating of such public health standards. New legislative authority and funding may be needed. This resources could be obtained through fees rather than general tax funds. 5. Cost: To provide the greatest return for each taxpayer dollar, government purchasers shop for low price, often through volume purchasing and value-driven sourcing. It is critical that standards for "clean" consumer goods take into account economically feasible manufacturing methods and consider both domestic and imported items and components. Again, it may be appropriate to have interested vendors qualify through C-MASS process. 6. Infrastructure: The public health and environmental health infrastructures are not now well prepared, equipped, staffed or funded to support these expanded responsibilities and new functions. There needs to be a phased-in approach based on both health and strategic priorities. 7. Responsible Leadership: There needs to be a way for public agencies to share information, such as for model contract provisions, laws, regulations, ordinances and so forth, so that the best possible decisions are made. Efforts should be coordinated with federal agencies having relevant jurisdiction such as FDA, CDC, EPA, USDA, and the CPSC; the state may want to consider establishing similar relationships with counterpart agencies at the state and local levels.

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-4	<p>The California Bed Clothing Flammability Standard and Green Chemistry</p> <p>One immediate challenge for the Green Chemistry Initiative is Technical Bulletin 604 (TB 604) to regulate the flammability of filled bed clothing including comforters, mattress pads, and pillows. This regulation, being implemented by the California Bureau of Home Furnishings and Thermal Insulation, is likely to lead to the introduction of large amounts of fire retardant chemicals and materials into California's homes and environment. Health and environmental questions such as those listed below should be answered for all stages of the lifecycle of these products: manufacture, use in consumers' homes, and end of life disposal.</p> <p>Although no specific materials are required to meet TB604, it is expected to be met by fiber mixtures containing inherently fire resistant materials and/or added fire retardant chemicals. Some of these fibers, (modacrylic, polyvinylidene chloride, and polyvinyl chloride) consist of polymers that are composed of monomers that are known to be mutagens/carcinogens and/or can cause neurological, developmental or reproductive impacts in animals.[1],[2], [3].</p> <p>In addition TB604 would also impose flammability requirements on foam used in bedding materials, such as mattress pads and pillows. The TB604 foam test is rigorous and, if met by adding FR chemicals to foam, would require significant amounts - much more than currently used to meet the furniture foam requirements included in TB117. A U.S. Environmental Protection Agency study of fire retardants shows areas of significant toxicological and environmental concerns as well as large data gaps for safety information for all of these chemicals. [4]</p> <p>The fire retardant chemicals currently used in foam in California include tris (1, 3-dichloro-2-propyl) phosphate (TDCP), which is a known mutagen and carcinogen. A CPSC analysis predicted up to 300 excess cases of cancer per million when humans are exposed to TDCP from furniture. Another primary fire retardant used in foam is a proprietary mixture called Firemaster 550 containing brominated fire retardants for which little toxicological information is available and a phosphahate which is known to be highly ecotoxic. .</p> <p>Before TB604 is implemented, the following questions and considerations should be addressed:</p> <ol style="list-style-type: none"> 1) What are the environmental impacts of the manufacture, use and disposal of products which are polymerized from toxic monomers or contain toxic or potentially toxic fire retardant chemicals? 2) What are the health impacts of using these fibers and materials in bedding? What is the level of human exposure to the toxic or potentially toxic fire retardant chemicals added to foam and fabrics? Are there residual monomers present in the inherently flame resistant fibers? Exposures for fetuses, young children and pregnant women (the most vulnerable populations to endocrine disruption and potential adverse health outcomes) as well as the number of hours people spend in bed in intimate contact with bed clothing should be considered. 3) Will the inherently flame resistant fibers break down to the toxic monomers in landfills? In that case, will the legislature need to add these bedding products to the list of products banned from the landfill under the Universal Waste Ban, which went into effect in February 2006? If so, will government managed and ratepayer financed local government programs be responsible for their safe disposal or will manufacturers be required to take these products back at the end of their useful life? 4) Do the flame retardant chemicals that would be used to meet the standard persist, accumulate and/or be potentially toxic in humans. Other fire retardant chemicals are rapidly accumulating in humans, wildlife, and the environment. U.S. women have some of the highest levels of fire retardants in their breast milk in the world. Many studies completed underway postulate that a relationship exists between previously used fire retardant chemicals such as PBDEs and birth defects, hyperactivity, reduced fertility and sperm counts and other neurological and reproductive conditions. Will similar chemicals be used to meet your standard? 5) Have studies been conducted on the fate and transport of fire retardant chemicals and materials as following their use in furniture and other consumer goods? Fire retardants such as PBDEs and PCBs have been found in remote areas including the Arctic Circle, with the highest levels found in killer whales. The lifecycle of products containing fire retardant chemicals must be considered including occupational exposure during manufacture, chemical exposure during use, and end of life disposal when products are combusted, land-filled, composted, littered, or recycled.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>6) When polyvinylidene chloride, polyvinyl chloride, or materials treated with brominated or chlorinated fire retardant chemicals burn, highly toxic dioxins and furans are believed to be produced. If there will be incineration of these bedding materials, an analysis of the health and environmental impacts of this disposal method should be done.</p> <p>7) Will plasticizers be used to make polyvinylidene chloride, polyvinyl chloride, and other polymers in the inherently flame resistant materials soft and flexible? Phthalates are sometimes used for this purpose. They are known endocrine disruptors and just have been banned from use in children's items in California.</p> <p>8) Estimates from New York State suggest that fire-safe cigarettes could lead to 50 to percent reduction in fire deaths The CPSC estimated that the current mattress flammability standard would reduce bedding fire deaths by 69 to 78 percent. With the requirement for fire-safe cigarettes in California beginning January 1, 2007, and a stringent standard for mattresses already in place, has the estimated fire death reduction associated with the proposed bed clothing standard been reevaluated? Has this significantly reduced fire death and injury risk led to a reconsideration of the need for potentially toxic fire retardant chemicals in consumer products?</p> <p>9) The Green Chemistry Initiative calls for the design of products and processes that reduce or eliminate the use and generation of hazardous substances at all stages of the life of a product, ranging from the manufacture of a product all the way until end-of-life disposal. Implementing a new bedding standard that results in the increased use and generation of hazardous substances appears to contradict the premise of the California Green Chemistry Initiative.</p> <p>[1] IARC (1999). IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Volume 71. Re-evaluation of some organic chemicals, hydrazine and hydrogen peroxide (Part One). IARC, Lyon. pp. 43-108.</p> <p>[2] U.S. EPA (2000). Toxicological Review of Vinyl Chloride (CAS No. 75-01-4). In support of summary information on the Integrated Risk Information System (IRIS). May 2000. EPA/635R-00/004. U.S. Environmental Protection Agency, Washington, D.C. Available at: http://www.epa.gov/iris/toxreviews/1001-tr.pdf</p> <p>[3] U.S. EPA (2002). Toxicological Review of 1,1-Dichloroethylene (CAS No. 75-35-4). In support of summary information on the Integrated Risk Information System (IRIS). June 2002. U.S. Environmental Protection Agency, Washington, D.C. Available at: http://www.epa.gov/IRIS/toxreviews/0039-tr.pdf</p> <p>[4] U.S. EPA (2005). Furniture Flame Retardancy Partnership: Environmental Profiles of Chemical Flame-Retardant Alternatives for Low-Density Polyurethane Foam. September, 2005. EPA 742-R-05-002A, U.S. Environmental Protection Agency, Washington, D.C. Available at: http://www.epa.gov/dfe/pubs/flameret/ffr-alt.htm</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-5	<p>Education and the Environment Initiative November 16, 2007 Maureen Gorsen Director Department of Toxics Substances Control PO Box 806 Sacramento CA 95812-0806 Dear Ms. Gorsen-</p> <p>On behalf of my environmental organization Heal the Bay, and the public-private partnership of the Education and the Environment Initiative, I express strong support for the Green Chemistry Initiative. Clearly, the current structure by which we regulate chemicals in California is not sustainable. Given that California has serious pollution, ecosystem degradation, and natural resource scarcity concerns, it is imperative that the state develop a more cradle-to-cradle approach. The Department of Toxics Substances Control's (DTSC's) leadership is essential to create such a new policy and regulatory framework. Green Chemistry will better enable California to protect people, and the environment, as well as economically keep pace with changes worldwide, and here at home.</p> <p>Educate about the environment is fundamentally critical to any such new Green Chemistry policy and attendant programs. Education is necessary in order to scientifically inform such a policy, practically and efficiently implement it, and also to disseminate information about it to future generations. Luckily, California is currently poised to lead the nation in environmental literacy: the Education and the Environment Initiative (EEI) is a landmark environmental education law that requires the development and implementation of multi-disciplinary environmental education curricula in all disciplines (science, history/social science, English/language arts, and mathematics) for all K-12 grade students in state public schools. The EEI was co-authored by environmental organization Heal the Bay and signed into law in 2003 by former California Governor Gray Davis. In 2005, Governor Schwarzenegger allocated state funds over two years for environmental education curricula development under the EEI. A national model, the EEI will ultimately allow six million California school children each year to have the information they need to make informed decisions about protecting their health and our precious natural resources.</p> <p>As currently being developed, the EEI will necessarily include information that touches on green chemistry specifically. For example, EEI statutory mandates specifically call for the EEI curricula to address topic areas such as "toxics and hazardous waste," "public health and the environment," "pollution prevention," and "environmental sustainability." Obviously, there is significant overlap between the educational mandate of the EEI and the subject matter and goals of any state Green Chemistry Policy.</p> <p>We therefore encourage DTSC to make sure there is full integration between the EEI curricula development and its implementation, and the Green Chemistry policy and program development (including, but not, limited to K-12, post-secondary, and vocational educational efforts associated with Green Chemistry.) To date, DTSC has been very supportive of the EEI effort, and we gratefully applaud their leadership in this regard. We hope that as the Green Chemistry policy unfolds, that DTSC will continue to closely coordinate with the EEI and share Green Chemistry educational content, potential outreach opportunities, and other resources. Together, we can help children learn about environmental issues and make informed decisions about their individual impact on the environment.</p> <p>Sincerely, Leslie Tamminen Legislative Director/EEI Director Heal the Bay</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-6	<p>Comments - California Green Chemistry Initiative Thank you for soliciting input from California residents concerning the Green Chemistry Initiative. I am currently writing a book-length narrative about environmental illness (including one fictional character based on Dr. John Balmes, who was extremely helpful to me when I first became chemically sensitive), and I would love to contribute my insights to your project. The REACH program currently underway in the E. U. would be a wonderful model for California. In addition to this, however, we need to zero in on those toxins to which the general public is being heavily exposed on a daily basis. At the top of this list is secondhand cigarette smoke. Twenty-one years ago, Surgeon General C. Everett Koop concluded that secondhand smoke causes disease. Twenty years later, Surgeon General Richard Carmona called secondhand smoke an alarming public health threat, "a serious health hazard at any level" One and a half years ago, the State of California's Air Resources Board defined secondhand smoke as "toxic." So what are we waiting for? Who are we afraid of? ...more</p> <p>on behalf of Trudy Fisher</p>
F-TA-7	<p>CalARVC's Comments The California Association of RV Parks and Campgrounds (CalARVC) requests that the Department of Toxic Substance Control prohibit the import, sale, or use of certain RV toilet additives as part of the California Green Chemistry Initiative. Many of these products are detrimental to onsite septic systems and often cause systems to fail and pollute surrounding soil and groundwater. CalARVC, which is comprised mainly of hundreds of small "mom and pop" RV parks and campgrounds from all over the state, has been seeking a solution for this problem to several years. CalARVC believes the best solution is to ban the sale and use of deleterious products that contain formaldehyde or similar biocides. Most of the toilet additive products sold and used in California contain formaldehyde or a derivative of formaldehyde. These products help dissolve toilet paper and bio-solids and are used by RV owners to prevent odors and blockages in their toilet systems. However, the chemicals in these products that help dissolve toilet paper and bio-solids also kill natural biological organisms used in many onsite wastewater systems. Many onsite wastewater treatment systems use natural organism to breakdown bio-solids and toilet paper. Thus, when RV holding tanks containing certain RV toilet additives are dumped into an onsite wastewater system, which is a common everyday occurrence at RV parks, the chemicals designed to eliminate odors and dissolve toilet waste also kill off the natural organisms causing the onsite septic systems to fail....more</p> <p>on behalf of California Association of RV Parks and Campgrounds</p>
F-TA-8	<p>Johnson & Johnson - Additional Comments On behalf of Johnson & Johnson and its family of companies, I appreciate the opportunity to provide additional comments on the California Green Chemistry Initiative. Johnson & Johnson has identified a number of key policy points regarding green chemistry that we believe are important guidelines that will lead to the overall success of California's Green Chemistry Initiative. Johnson & Johnson recommends specific policy points should be structured around the following policy goals and objectives:</p> <p>on behalf of Johnson & Johnson</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-9	<p>Policy Elements proposed by the Silicon Valley Leadership Group Green Chemistry in California – Initial Policy Elements Proposed by the Silicon Valley Leadership Group (These comments have been posted to all four discussion forums in the same form, due to overlap in topics.) The Silicon Valley Leadership Group advocates a comprehensive, integrated approach to expanding Green Chemistry in California. By highlighting leaders in the corporate environmental practices and encouraging those who are further behind, we can all move ahead. We envision Green Chemistry as an interactive, evolving partnership with industry, government and consumers working together to protect human health and promote a cleaner, safer environment. Leadership Group members involved in crafting these initial suggestions include those from the electronics, biotechnology, pharmaceutical, chemical manufacturing, and supporting sectors. For more information about the Leadership Group please visit www.svlg.net. The Leadership Group proposes the following policy elements to further Green Chemistry in California:</p> <ol style="list-style-type: none"> 1. Strengthen the recognition and pursuit of Green Chemistry processes and products by establishing clear criteria and voluntary certification based on comprehensive lifecycle considerations. Equally important, consumers need to be educated about responsible choices and practices. 2. Explore models other than, or building upon, the current Materials Safety Data Sheet (MSDS) system to provide needed chemical hazard data throughout the supply chain. 3. Establish a Green Chemistry Coordination Council to collect and promote the sharing of information, highlight businesses with green practices, provide assistance to businesses lacking resources, and educate consumers. 4. Prioritize chemicals for screening, testing and appropriate restrictions. We suggest building upon the model of Canada's analysis and prioritization as well as the Proposition 65 review process conducted by OEHHA. Chemicals of high concern should be allowed for targeted, low-exposure uses as determined in an open process by DTSC. 5. Greater investment in pollution prevention in the short term as well as extension of the current CA Pollution Prevention model to downstream chemical users as an element of the long term Green Chemistry strategy. 6. Continue the Conversation with California to sustain progress in Green Chemistry. The dialogue between DTSC and stakeholders has been very helpful and will result in more well-developed, effective policy. <p>IN MORE DETAIL:</p> <p>1) Issue: Our market economy and the innovations that it engenders, environmental and otherwise, are driven by the relationship between industry and consumers. In order for industry to offer products that are environmentally-sound, and for consumers to recognize them, clear and stakeholder-driven criteria are necessary. Proposal: The Leadership Group proposes we strengthen the recognition and pursuit of Green Chemistry processes and products by establishing clear criteria and voluntary certification based on comprehensive lifecycle considerations. Equally important, consumers need to be educated about responsible choices and practices. While the focus of the Initiative has been on chemical safety, green chemistry in the broader sense should incorporate an accounting of embedded energy, CO2 impact, water usage, packaging, recyclability and so forth. Industry on the whole is already moving toward a greater consideration of these factors in our practices. The difficulty of quantifying and ascribing relative importance to these factors points to the need for commonly-held practices or industry standards. A voluntary certification program for green chemistry processes and products will clarify goals for industry members while empowering consumers with the information they need to make informed choices. As green chemistry practices evolve, according to the green chemistry principles we are so well aware of, so should the criteria - we should build flexibility into the system. It is important to note that a voluntary system is more pragmatic than</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>standards at this point, given the innovative and often resource intensive approaches that will be required, the longer timeline necessary for industry transformation, and the need for consumers to have choices. As with organic food, not every consumer wants the environmentally-sensitive approach, if it costs more. The International Standards Organization (ISO) 14001 process certification and ACC's Responsible Care Management Practices are good examples to build upon.</p> <p>It is also important to note that potential green chemistry certification should be a recognition of process in addition to the product. As many experts in the DTSC Symposia have remarked, we are not only trying to improve products, but the entire system that goes into making that product. And we should realize that perfection will not be immediate, but evolve over time. In order to motivate voluntary certification some type of incentive, especially market mechanism such as rebate, tax incentive, or fee refund, should be explored.</p> <p>We understand very well that the consumer wants environmental accountability. As consumers gain in accountability, though, so should they gain in responsibility. This is in no way a proposal to allow industry to abdicate its responsibility for the safer use of chemicals, but rather to acknowledge that in a market-based society, corporate and consumer responsibility must closely intertwine to be successful. Beyond making informed purchases, we can best protect the environment when consumers understand Green Chemistry applies to them as well. How they collectively handle chemical products has an enormous effect (for example, nail polish remover can be easily poured down a household sink which would not be allowed in the workplace). The Green Chemistry Coordination Council described in the third point below could assist in consumer education.</p> <p>2) Issue: The MSDS provides insufficient data on chemical hazards to those downstream in the supply chain. Proposal: The Leadership Group proposes the DTSC explore models other than, or building upon, the current Materials Safety Data Sheet (MSDS) system to provide needed chemical hazard data throughout the supply chain.</p> <p>Our members often find the data included on the Material Safety Data Sheet (MSDS) to be insufficient for determining chemical hazards. Many times important information is addressed in a superficial, boiler-plate fashion or missing altogether. The same raw material from different suppliers may have divergent information. This is in part due to some government regulations requiring that an MSDS be obtained directly from the manufacturer. While we recognize that confidential business information needs to be protected, best possible data on hazard and ecological effects should be made readily available to the supply chain and other stakeholders. In order to meet customer information requirements on chemicals in products, some electronics manufacturers currently must request additional information from upstream suppliers. Instead of doing this on a case by case basis, and in some cases taking the costly approach of reverse-engineering products to determine content, it would be more cost-effective to make raw materials hazard information available further upstream.</p> <p>One approach that could facilitate the sharing of information could be to use the existing MSDS system as a vehicle. More uniform information availability, through approaches such as the ANSI standard for a 16-section MSDS or the IPC 1752 could be an improvement. However, since the MSDS was originally intended to provide more immediate emergency response and use information, it might be best to explore other options such as an MSDS addendum, focused on hazard data. As both REACH and industry efforts such as the Global Product Stewardship initiative make available this data over a 4-10 year timeframe, it is important to recognize that generating this hazard data will take time.</p> <p>A voluntary certification process, with recognition for particularly thorough MSDS's, could also improve the quality of information while allowing chemicals manufacturers to differentiate their products. The Global Harmonization System for the Classification and Labeling of Chemicals (GHS) should be considered, as well. Any model chosen should include the appropriate ecological as well as toxicological information. We also recommend that early stage R&D chemicals be exempted due to their limited use and limited exposures.</p> <p>Worker exposure issues involving recognized hazards (mostly in small/medium enterprises) during the Conversation with California suggests that incorporating MSDS information into real-life practices may be an issue, aside from content. Technical Assistance for those less familiar with critical MSDS information is included as part of the Green Chemistry Coordination Council described below.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>3) Issue: Some companies and industries have already made much progress in achieving the aims of Green Chemistry while others lag behind. Green Chemistry involves myriad innovations and the collection and processing of much information. We do not have an adequate way of sharing Green Chemistry practices nor have we made the investment to encourage and reward green efforts.</p> <p>Proposal: The Leadership Group proposes the establishment of a Green Chemistry Coordination Council to collect and promote the sharing of information, highlight businesses with green practices, provide assistance to businesses lacking resources, and educate consumers. The information presented by the speakers, panelists, and stakeholders during the past year of effort on this Initiative has been incredibly thorough, enlightening, and inspiring for all stakeholders. We suggest the DTSC catalog and make easily available information regarding best practice screening processes, green chemical design, collaborative efforts such as the ACS Green Chemistry Institute, and international efforts such as the Global Harmonization System. All stakeholders still have a lot to learn in this dynamic area, and everyone stands to gain from continued information sharing. DTSC's leadership in this area should be continued by establishing it as a central clearinghouse of information for the state and beyond. Many medium and small companies are lacking in appropriate knowledge and resources, and will need assistance in taking advantage of Green Chemistry practices. Providing incentives for the sharing of data and best practices will help all companies. We further suggest building upon and making readily available the information provided by existing efforts: ACS Green Chemistry Institute, Cleangredients, U.S. EPA's Design for Environment Program, Performance Track, the chemical industry's HPV testing program, eChemPortal, EPEAT, and DTSC Technical Resource Center.</p> <p>4) Issue: California has limited resources to evaluate chemicals for restriction. Chemical safety is a measure of exposure as well as toxicity. While we need to carefully assess and restrict the use of chemicals of concern, complete bans fail to allow for appropriate and beneficial uses.</p> <p>Proposal: The Leadership Group proposes the DTSC prioritize chemicals for screening, testing and appropriate restrictions. We suggest building upon the model of Canada's analysis and prioritization as well as the Proposition 65 review process conducted by OEHHA. Chemicals of high concern should be allowed for targeted, low-exposure uses as determined in an open process by DTSC.</p> <p>The DTSC, together with other relevant State agencies, needs to establish clear and consistent science-based protocols for screening and testing. These should include determination of endpoints of concern and modes of action, where scientific and methodological questions are sufficiently advanced to enable consistently sound science-based judgments of potential risk. The use of a transparent and rigorous process to evaluate risk factors as indicated by toxicological, epidemiological, and exposure data will allow us to compare the relative importance and safety of chemicals as well as determine whether any restrictions or substitutions are appropriate. A scientific panel of experts with a range of theoretical and applied chemicals experience can best establish and oversee a process acceptable to all stakeholders. The Proposition 65 review process may offer a starting point for development of a thorough, scientific process to meet these broader needs.</p> <p>Government entities around the world have been or are in the process of revamping their chemicals use policies. Although the DTSC will need to analyze the individual needs of our state through such means as chemical mapping, we should coordinate with the chemicals policies of other countries to minimize confusion, cost and competitive impacts. Starting with the thorough screening done by Canada's Environmental Policy Act (CEPA) would allow us to build upon their scientific knowledge base and mitigate the burden of data gathering.</p> <p>Any proposed restrictions or mandates should be targeted and include careful evaluation of alternatives. This targeted approach will allow us to concentrate our resources where most needed. Furthermore, any mandates should be harmonized with systems in other countries as much as possible. While we wish it were not necessary to use chemicals determined by such scientific protocols to be of high concern, many times they are needed to promote human health or advance ground-breaking research. This is the uncomfortable irony with which we will have to live until we find better alternatives. In the meantime, targeted use of these chemicals under highly controlled and low-exposure scenarios should be allowed by DTSC, after an open, scientifically based stakeholder process. In the absence of safer alternatives, which should be technically feasible, improve</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>health/safety/environmental profile, be of comparable or superior performance, cost-effective, and be capable of persistence, banning should be avoided. In that case, resources should be devoted to R&D or incentives should be provided to develop cost-effective alternatives. Our goal should be a marketplace where informed decision making at both the manufacturing and consumer levels is consistently delivering changes/substitutions that advance our collective interests along the dimensions outlined above.</p> <p>We recommend that novel R&D chemicals, used in relatively tiny amounts in highly controlled settings, be excluded from any consideration of a restriction or mandate. There are rarely, if ever, exposures outside of the laboratory. Government oversight of these chemicals would not be cost-effective and would be counterproductive to the aims of Green Chemistry. Flexibility in this type of research chemical use promotes the innovation of safer chemicals and processes. Both CEPA and REACH exempt these chemical uses. Exemptions should also be allowed for select pilot demonstrations and testing.</p> <p>5) Issue: It will take a significant amount of time for industry and consumers to move to Greener Chemistry and we need to address pollution concerns in the meantime. Existing efforts at pollution prevention in the state utilize a collaborative model that has proven effective, but has been limited by its modest resource commitment and its narrow manufacturing focus.</p> <p>Proposal: The Leadership Group proposes greater investment in pollution prevention in the short term as well as extension of the current CA Pollution Prevention model to downstream chemical users as an element of the long term Green Chemistry strategy.</p> <p>Pollution prevention programs and policies such as SB 14 have been promoted for quite some time, yet they never receive anywhere near adequate funding and attention. We need to increase our investment in pollution prevention assistance, especially for medium and small businesses that either lack the resources or motivation to tackle the problem on their own. Since pollution prevention has led to demonstrated improvements and optimization of chemical processes, it is a critical, complementary approach to Green Chemistry's goals of better chemical design.</p> <p>The model of collaboration between companies, the DTSC and third party experts (in the case of the SB 14 program, from the University of California), may also offer a model applicable to a broader Green Chemistry strategy. The impressive accomplishments of the Institute for Research and Technical Assistance in enabling development of substitutes for problem solvents in various applications suggest that such targeted 3rd party collaboration may pay dividends in products/product use as well as in manufacturing. This suggests the possibility of 1) taking chemicals of top priority concern, 2) identifying the specific applications or industry uses posing the greatest risk from those chemicals, and 3) applying a collaborative process of agency, industry and third-party experts to identify or develop viable alternatives that can maintain efficacy, but reduce risk in those targeted applications.</p> <p>6) Issue: The stakeholder process for developing Green Chemistry has provided much more comprehensive progress than could have been achieved otherwise.</p> <p>Proposal: The Leadership Group proposes we continue the Conversation with California to sustain Green Chemistry progress. The dialogue between DTSC and stakeholders has been very helpful and will result in more well-developed, effective policy.</p> <p>We commend the DTSC for encouraging creativity in finding safer alternatives and providing opportunities for open-ended discussion. There remains, though, a very real need for extensive further discussion by the stakeholders in this Green Chemistry Initiative. We hope that the inclusive nature of this process is not at an end. There are so many pieces to Green Chemistry and as the focus narrows to various subtopics, meaningful stakeholder participation will be essential. We have all built personal relationships and broadened our understanding of the various points of view. It would be a shame to toss this hard-won experience aside.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-10	<p>Green Chemistry Initiative The Western States Petroleum Association (WSPA) is pleased to offer the following comments on policy options being considered in the context of Cal-EPA's Green Chemistry Initiative. Many of the comments submitted to DTSC to date and debated in public forums refer to the need for California to supplement the requirements of the Federal Toxic Substances Control Act (TSCA). Prior to immediately moving in this direction, WSPA believes that DTSC must evaluate what regulations and information are currently available and whether these tools are being appropriately implemented and applied prior to developing new programs. Indeed, we expect this analysis is already underway, pursuant to the mandate to conduct a "baseline assessment" of existing programs and information described in the April 20 memorandum from Cal-EPA Secretary Linda Adams announcing the Green Chemistry Initiative. We further expect that this analysis will be presented to Initiative stakeholders for review and comment along with the policy options that flow from it, to ensure that all relevant information has been considered, including information obtained from national and international programs. We are optimistic that this approach will lead to meaningful improvements in existing state programs.</p> <p>on behalf of Western States Petroleum Association</p>
F-TA-11	<p>Concerned About Safety of Products I am a resident of Ojai, California, and am concerned about the safety of many of the products we use from toxic chemicals in them - mostly food, but also pharmaceuticals, cleaners, etc. I have learned about the Green Chemistry Initiative which provides an opportunity to protect California by acting to restrict or eliminate especially dangerous substances and by mandating safer alternatives. This is a wonderful idea and I heartily endorse it. However, I really encourage you to ensure that in addition to incentive programs, the Initiative implements protective regulations, including restrictions and bans of chemicals for which the weight of evidence demonstrates a severe hazard to human health and/or the environment. Many thanks for considering this suggestion.</p> <p>on behalf of Walter M. McClelland</p>
F-TA-12	<p>California Green Chemistry Initiative - Comments I am in support of the Green Chemistry Initiative to restrict or eliminate dangerous substances in California. We are being exposed to far too many chemicals in our daily environment and many of us are getting sick. It is especially necessary to get them out of commercial cleaning products that are used everywhere, from stores to doctor's offices and even hospitals! We need some strict regulation on use of harmful chemicals that in many cases can simply be replaced by less or non toxic ones. This is a critical situation which requires regulations to test chemicals and ban those shown to be a hazard to our health and well being. Please reply too: Diane Brodd</p> <p>on behalf of Diane Brodd</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-13	<p>Comments on the California Green Chemistry Initiative I would like to add my support of the Green Chemistry Initiative to restrict or eliminate dangerous substances in California I would like to see this initiative include the problem of chemicals being used in our daily lives that have not been tested for neurotoxicity in children. I urge you to include restrictions and bans on chemicals that demonstrate a hazard to our health and/or environment. This is a critical situation that requires immediate attention by not only providing incentive programs but requiring restrictions and bans on those chemicals that are potentially dangerous.</p> <p>Please reply too: Linda Blackwell</p> <p>on behalf of Linda Blackwell</p>
F-TA-14	<p>CSPA Summary Comments on the California Green Chemistry Initiative Dear Director Gorsen: The Consumer Specialty Products Association (CSPA) has appreciated your continual efforts to include us in the discussions and stakeholder input on the Department of Toxic Substances Control (DTSC) California Green Chemistry Initiative. We also appreciate this opportunity to provide supplemental comments in addition to the information that we have provided on the "Conversation with California" website. CSPA is a national nonprofit trade association that represents more than 260 companies engaged in the formulation, manufacture, distribution and sale of consumer, institutional and commercial products. CSPA member companies manufacture and market a wide range of products, including: cleaning products, disinfectants and sanitizers, candles and air care products, household pesticide products, automotive products used to clean and maintain vehicles, and polishes and floor maintenance products. CSPA members are committed to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers. CSPA and our members support the broad goals of the Green Chemistry Initiative and look forward to working with DTSC and other stakeholders in the state to help spur green chemical innovation and ensure that products are safe.</p> <p>I. Background CSPA member products improve the quality of human life and are necessary to protect the public health against dangerous diseases, infestation, and unsanitary conditions. CSPA members are committed to providing products that are thoroughly evaluated for human and environmental safety and go through rigorous safety-based assessments before they are brought to market. CSPA members are also committed to clear and meaningful labeling on consumer products, i.e., label instructions are written to ensure that consumers use products in accordance with label instructions. Finally, CSPA members are committed to the development of green products that are safe for human health and the environment. In addition, CSPA members routinely apply green chemistry and green engineering principles in their operations and have been honored with awards for their efforts. The consumer products industry develops products that meet or exceed safety requirements of all state and federal agencies in the United States and Canada charged with regulating those products, including the California Department of Pesticide Regulation, the California Air resources Board, and other state agencies, U.S. Consumer Product Safety Commission (CPSC), the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the U.S. Food and Drug Administration (FDA), Health Canada, and Environment Canada. While we support the California Green Chemistry Initiative and believe there is much that can be done to address and spur the development of green chemical technology, CSPA believes that regulation of our members' products under current federal and state regulatory authorities provides safety and protection to consumers. Below is a short summary of the various regulatory authorities that ensure the safety of consumer products and their ingredients. While it is not an exhaustive list of the regulatory requirements these products undergo, it illustrates the extensive oversight that already</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>surrounds the manufacturing and marketing of consumer specialty products.</p> <p>II. Toxic Substances Control Act (TSCA) The Toxic Substances Control Act (TSCA) gives EPA the authority to regulate chemicals produced or imported into the United States. EPA repeatedly screens these chemicals and can require reporting, testing or a complete ban of those that may pose an environmental or human-health hazard. Any person intending to manufacture or import a chemical substance first must determine whether the substance is listed on the TSCA Inventory. If it is not listed, the prospective manufacturer or importer must satisfy premanufacturing notice (PMN) requirements before commencing production or importation of the substance. In filing a PMN, the manufacturer or importer must give their identity, specific chemical identity, product volume, use, exposures (worker, user and consumer), and environmental fate. Additionally, any test data relating to environmental or health effects of manufacturing, processing, distributing, using, or disposing of the new chemical substance must also be submitted. The PMN must be filed at least 90 days prior to the commencement of commercial production or importation of a new chemical substance. EPA's review of a PMN consists of seven major stages designed to ensure that EPA examines all aspects of a new chemical, including its physical and chemical properties, potential toxicity, exposure of workers, users and consumers, and economic benefits. EPA has the authority to prevent, delay, or limit manufacture after the initial PMN review period ends. EPA can issue an administrative order regulating a new chemical substance if the Agency finds that there is insufficient information to reasonably evaluate the risk and either the chemical may present an unreasonable risk to health or the environment or it will be produced in substantial quantities with the result that either substantial quantities will enter the environment or there will be substantial or significant human exposure to the substance. While EPA does not require a designated set of toxicity testing to be included in the PMN submissions, it has identified several categories of chemicals and the concerns areas where it has required such tests. Under these requirements a company must provide information addressing these risk concerns or face restrictions based on default assumptions. EPA has broad authority to regulate the existing chemicals in commerce as well. If a chemical presents unreasonable risks to health or the environment, EPA must initiate a rule-making to regulate the chemical. As of 2007, EPA has issued over 1300 Significant New Use Rules, which restrict the manufacture, import, or processing of a substance . EPA can prohibit or limit the manufacture, processing, distribution, commercial use or disposal of the chemical; prohibit or limit the use of the chemical in a concentration above a specified level; require adequate warnings and instructions with respect to the chemical's use, distribution in commerce or disposal; require record-keeping; prohibit or regulate disposal of the chemical; and require notification to the purchasers or the general public about the risks involved and to replace or repurchase a chemical substance or mixture if requested. EPA also has the authority under TSCA to require manufacturers of substances to develop safety and environmental data.</p> <p>III. Consumer Product Safety Act (CPSA) The Consumer Product Safety Act (CPSA) provides that when the Consumer Products Safety Commission (CPSC) finds an unreasonable risk of injury associated with a consumer product it can develop a standard to reduce or eliminate the risk. The CPSA also provides the authority to ban a product if there is no feasible standard, and it gives CPSC authority to pursue recalls for products that present a substantial product hazard. The CPSC is authorized to set safety standards as to consumer product performance, composition, contents, design, construction, finish, packaging and labeling. In general, the manufacturer of a consumer product subject to regulation must issue a certificate announcing compliance with the applicable standards, and must label the product with the date and place of manufacture, the identity of the manufacturer, a certification of compliance with any applicable rule, and a brief description of such rule. Manufacturers are required to immediately notify the CPSC if it obtains information which reasonably supports the conclusion that a product: (1) fails to comply with a consumer product safety standard or banning regulation or a voluntary consumer product safety standard upon which the CPSC has relied upon; (2) contains a defect which could create a substantial product hazard described in the CPSA; or (3) creates an unreasonable risk of serious injury or death.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>In the last ten years, CPSC obtained 472 voluntary recalls involving 110 million product units. During this time, CPSC obtained 1031 corrective actions (including recalls and other actions to keep unsafe products from consumers).</p> <p>IV. Federal Hazardous Substances Act (FHSA) The Federal Hazardous Substances Act (FHSA) requires labeling of hazardous substances sold to households. It prohibits the sale or introduction into interstate commerce any product which does not comply with the regulations. FHSA regulations provide specific guidelines to determine potential risks specific to the entire formulation and package. Product risk assessments are the basis for label decisions and precautionary label text to protect consumers and children. At a minimum, labels must include hazard signal word, affirmative statement of hazards, the name of each component that contributes to the hazard, and precautionary measures to be taken to avoid risk, required or appropriate instruction for first aid treatment, handling instructions, storage instructions, and "Keep out of reach of children."</p> <p>V. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) provides the basis for regulation, sale, distribution and use of pesticides in the U.S. FIFRA authorizes EPA to review and register pesticides for the specified use which a registrant applies for. Before registering a new pesticide or new use for a registered pesticide, EPA must first ensure that the pesticide, when used according to label directions, can be used with a reasonable certainty of no harm to human health and without posing unreasonable risks to the environment. To make such determinations, EPA requires more than 100 different scientific studies and tests for active ingredients. In fact, EPA has banned and severely restricted 64 pesticides in the United States. When EPA registers a pesticide, it approves the product's label, which includes (among other things) directions for use, hazard warnings, and precautions. It is a violation of FIFRA for any person to use a pesticide in a manner inconsistent with its EPA-approved labeling. EPA also has the authority to suspend or cancel the registration of a pesticide if subsequent information shows that continued use would pose unreasonable risks to health or the environment. EPA may decide to remove a pesticide from the market based on information from a variety of sources: new studies conducted by the registrant, the Government, or a third party; incident information submitted by a registrant; or results of the EPA's periodic review of pesticides and tolerances. EPA is currently completing a review of those pesticides registered before November 1984 to ensure that they meet current scientific and regulatory standards. This process, called reregistration, considers the human health and ecological effects of pesticides and results in actions to reduce risks that are of concern. Concurrently, EPA has begun a registration review process for those products registered subsequent to 1984 and for those pesticides that were review under the reregistration process previously. These ongoing review processes assure the continual reexamination of the safety and environmental profile of pesticides. EPA and the states enforce FIFRA primarily through stop sale, use, and removal orders, civil penalties, or a combination of the two. Unlawful acts under FIFRA include: selling an unregistered or misbranded pesticide; selling a pesticide whose composition differs from the one described in the pesticide's registration application, violating EPA's labeling requirements, failing to file annual production reports, and violating FIFRA's export requirements.</p> <p>VI. Recommendations for Product Stewardship & Safety-based Assessments As stated in our November 6 "Conversation with California" entry, CSPA supports company performed safety-based assessments of consumer products prior to the marketing of a product, that take into consideration all of the phases of a product's life-cycle. CSPA also supports appropriate use-restrictions for chemical ingredients when scientific safety-based assessments indicate that they cannot be used safely in a consumer product or use application. CSPA and our members believe that every responsible company should be performing these types of safety-based assessments and supports initiatives that recognize companies for these types of procedures. In fact, CSPA has demonstrated our industry's commitment to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers, when we initiated our Product Care program in 2001.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>CSPA's Product Care program is a stewardship program for the consumer and institutional specialty products industry where participating companies have agreed to go beyond government regulations in emphasizing health, safety and environmental concerns by carefully designing products, purchasing raw material and packaging, operating safe manufacturing facilities, promoting safe storage and distribution, providing useful product information, answering consumers questions and anticipating product disposal needs. CSPA believes that these types of product stewardship programs should be considered as frameworks for programs developed under the Green Chemistry Initiative.</p> <p>Product Care provides a framework for companies to identify and commit to stewardship principles, share ideas and information and benchmark better performance. Participating companies have pledged to develop management principles for each of seven areas in a product's life cycle from development in a research facility through product use and disposal. Through this program Companies Must Commit to Evaluate:</p> <ol style="list-style-type: none"> 1. Product Design 2. Raw Material, Package and Service Supply 3. Manufacture and Production Site Management 4. Product Storage and Distribution 5. In-market Support, Incident Evaluation and Follow-up 6. Consumer Education and Outreach 7. Product Disposal <p>Stewardship did not begin when CSPA's Product Care program was initiated in 2001. Responsible companies have long followed policies promoting safe products that provide important health benefits while not adversely affecting the environment.</p> <p>CSPA believes it is vital that these types of product stewardship programs and companies that participate in these programs be recognized and fostered through any program developed under the Green Chemistry Initiative. In particular, CSPA believes that DTSC and California can leverage and recognize programs like Product Care as a way of encouraging companies to establish robust procedures to ensure product safety and environmental safety.</p> <p>VII. Recommendations for Chemical Data Development Initiatives</p> <p>Chemical data development efforts should build on existing statutory and regulatory structures, voluntary initiatives, and data development efforts. CSPA does not support California-specific data development requirements and pre-market approval process for chemicals or consumer products. However, CSPA supports collaboration by DTSC and California in ongoing work by other government agencies to assess chemicals and consumer products. Specifically, California and DTSC could leverage efforts by Health and Environment Canada in addressing priority chemicals in the Chemicals Management Plan. DTSC and California could collaborate with these agencies on their high priority list and avoid needless duplication of current data development and prioritization efforts. DTSC and California could also participate in the effort launched in August during the Security and Prosperity Partnership (SPP) with under the Montebello Agreement involving trilateral cooperation among the governments of Canada, the United States and Mexico to share chemical information and safety assessments.</p> <p>In addition if DTSC and California move forward with efforts to establish chemical priorities the process should be collaborative and should include scientific experts in toxicity and exposure, chemical manufacturers, consumer product manufacturers, and nongovernmental organizations. CSPA believes inclusion of manufacturers of the chemicals and consumer products could provide toxicity and exposure/use data to determine whether the uses of "priority chemicals" are safe or should be restricted.</p> <p>As referenced above, CSPA does not support pre-market approval of chemicals or consumer products, because this would be an incredibly burdensome and expensive process for the State of California and would unnecessarily slow down the development of products. For example, the Department of Pesticide Regulation registers approximately 12,000 pesticide products sold in the State and in 2005-06 it cost the agency over \$17.5 million to review and approve these products . To require pre-market approval for the hundreds of thousands of chemicals and consumer products in</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>commerce would be cost-prohibitive.</p> <p>VIII. Support for Appropriate Ingredient Disclosure Throughout Green Chemistry discussions and in recent market research consumers and others have expressed a desire to know what ingredients are in the products they use in their everyday life. These consumers are interested in having this knowledge in order to make informed product choices. It may appear that product ingredient information may not be readily available to consumers; however, our members willingly provide information to meet consumer needs. While some organizations have expressed concerns about ingredients in consumer products, much of this information is inaccurate. This is primarily due to the reliance on outdated resources that are dependant on old technologies or on assumptions made by sources that are not well versed in specific product chemistries.</p> <p>CSPA and our members support an appropriate approach to providing accurate information to consumers through ingredient communication. Our industry stands behind the safety of our products and the appropriate use of chemical ingredients in those products. We would like to work with DTSC and the State of California to implement a means of ingredient communication that would provide consumers with the information they can use to make informed decisions regarding the products they use in their homes.</p> <p>IX. Essential Principles for Green Chemistry Initiatives As any Green Chemistry program moves forward, CSPA believes, that in order for the effort to be credible and have a positive impact it must be structured in a way that includes all stakeholders and provides a sound scientific basis for the program. Specifically, Green Chemistry should ensure the safety of chemicals and consumer products through the use of sound science in the decision-making process. Additionally, green chemistry programs should be designed to ensure that products remain technologically and commercially feasible to produce; and that product efficacy, performance, and usability are not compromised or undermined. As such, Green Chemistry must foster innovation and not limit the development of new chemistry technologies.</p> <p>X. Support for Initiatives to Spur Green Innovation Stimulating green chemical innovation has been a core concept of the Green Chemistry Initiative, and discussion of this topic has shown the promise that new technologies have for improving the standard of life in California and reducing environmental impacts. CSPA supports collaborative efforts to encourage public and private partnerships with the goal of developing “greener” products and “environmentally responsible” ingredients rather than mandatory and voluntary state labeling programs that endorse green products or programs that stipulate a single third-party certification of green products.</p> <p>CSPA supports initiatives that provide incentives for companies that innovate and develop technologically and commercially feasible products using green chemistry. CSPA also supports recognition for companies that develop sustainable business operations, processes, and/or products. We also believe there are unique opportunities in California for research that identifies areas for the use of green chemistry in consumer products. Essential elements to ensuring that these technologies become widespread are implementing State policies that are designed to overcome barriers to commercial application of green chemistry research and development efforts.</p> <p>XI. Conclusion Once again, CSPA has appreciated DTSC’s efforts to include all stakeholders in the discussions during the California Green Chemistry Initiative. CSPA believes that the Green Chemistry Initiative holds incredible promise for helping spur green innovation in California. We also believe that the Initiative can leverage ongoing chemical data development initiatives in setting chemical priorities. Further, CSPA believes that DTSC should recognize and encourage the current product stewardship procedures and safety-based assessments that companies perform prior to marketing a consumer product. CSPA would also look forward to working with DTSC and the State of California on an appropriate ingredient information system to help inform consumers when making their purchasing decisions.</p> <p>CSPA looks forward to continuing to work with DTSC through the Green Chemistry Initiative, as recommendations are developed, and CSPA hopes that</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>our continued participation in this discussion will provide meaningful help to the endeavor. Please feel free to contact me directly at (202) 833-7328, or CSPA's in-state representation, Laurie Nelson at (916) 446-1111 if you have any questions about these comments.</p> <p>Respectfully Submitted, Andrew R Hackman Manager, State Affairs Programs</p>
F-TA-15	<p>High Production Volume (HPV) Challenge Program: A Landmark Program Making More Health and Environmental Data Publicly Available Than Ever Before</p> <p>During the course of the conversation with California, the High Production Volume (HPV) program has been the subject of discussion and criticism. The HPV program is a voluntary initiative that was launched as a cooperative effort among EPA, the chemical industry, and Environmental Defense in 1998. Through this effort, more than 300 companies and consortia volunteered to provide safety information on chemicals, which collectively represent nearly 95 percent of U.S. chemical production by volume. It has made more health and environmental data publicly available faster than any other regulatory or voluntary initiative before it. This significant contribution has been widely recognized as an important and successful program by EPA, state and foreign governments, public health officials and professional science organizations. By most measures, the HPV Program rates a solid A. Some have unfairly criticized the chemical industry and EPA's performance in this unprecedented program. However, more often than not, these criticisms are predicated on faulty analyses, and overly simplistic reviews of the program. For example, some critics want to look at raw numbers alone as a measure of the program's success or failure, without examining any underlying circumstances that might shed light on or explain the numbers more completely.</p> <p>ACC acknowledges that not all HPV Challenge submissions are complete and that the program did not meet its targeted end date, but industry commitments are strong and continue to be met. Sponsors have completed initial submissions for 97% of those chemicals sponsored in the U.S. Challenge component of the program. This includes submitting to EPA studies on more than 11,000 health endpoints.</p> <p>The HPV Challenge Program was unprecedented. Prior to the HPV program, no one had experience with an ambitious plan that sought to make a fairly significant amount of screening-level hazard information on some 2,200 chemicals publicly available in a relatively short 6- or 7-year period. Examples of common problems encountered by sponsoring manufacturers that slowed work progress in the HPV Program are: insufficient technology for analytical method development; delays when preparing testing methodologies for substances that are difficult to test; guidance documents do not necessarily define all the requirements of a study, requiring sponsors to fine tune the guidance; and learning curves in the early stages of the program had to be overcome. In fact, manufacturers volunteering in the HPV program made commitments to use their best efforts to complete work by target deadlines.</p> <p>Comparing Speed of US HPV Submissions with Those Sponsored in the OECD Program Compares Apples to Oranges</p> <p>While it is true that a sponsor may fulfill a commitment either by submission to EPA in the U.S. component of the Challenge Program, or by submission to the OECD SIDS international program, comparing the completion rate between the two is not a fair one. In the OECD program, sponsors obtain a country sponsor to which a dossier and SIDS Initial Assessment Report (SIAR) are submitted for review and acceptance. Once the member country is in agreement with the content of the SIAR, the SIAR is then submitted to the OECD for review and comment by other member countries. Therefore, the sponsor country's review, comment, and agreement with the SIAR are imperative before a submission is deemed complete under the terms of the HPV Challenge Framework. This frequently involves a significant amount of discussion concerning data questions and data interpretation. In operational</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>terms, this makes for a far lengthier process than is the case for those submissions to the U.S. EPA. Consequently, comparing the speed with which submissions are made in the two components of the Challenge Program results in a skewed interpretation of the submission rate.</p> <p>TSCA Is Strong and Robust Critics of the HPV program often maintain that the Toxic Substances Control Act (TSCA) is burdensome and blames it for the fact that EPA has not issued more test rules covering 243 HPV orphan chemicals, although these critics fail to offer any actual evidence to support this assertion. In fact, the requirements under TSCA are quite reasonable and not burdensome to meet. And, in point of fact, EPA plans to issue several section 4 test rules between the end of 2007 and 2009 on most, if not all, HPV orphan chemicals.</p> <p>Alternatives to Direct Testing Are Appropriate Some criticize the quality of HPV submissions based on their reliance on alternatives to direct testing, i.e., unpublished data; application of estimation methods; and category approaches. This criticism is unfounded. First, the fact that a study is not published does not mean that it is unreliable or less accurate than one that is published. Many scientific journals will not publish negative (finding that something did not happen)—studies having a bias for positive (something did happen) outcomes. The majority of the data and relevant studies were in company files and had not been published because TSCA does not require the submission of data that fails to show an adverse effect, and most companies generally were not inclined to share expensive test results with their competitors.</p> <p>Second, the use of estimation methods and category approaches was explicitly encouraged by EPA in the HPV Challenge Program. (See October 14, 1999, letter to HPV sponsors from EPA Deputy Assistant Administrator Susan Wayland). A quick review of the HPV guidance on EPA's and OECD's websites makes clear that these alternatives are appropriate when developing screening-level hazard information to complete the SIDS data sets, recognizing the significant animal welfare issues involved. Unfortunately, some choose to ignore the sensitive animal welfare issues presented in testing programs, which were a principal reason for the use of alternative approaches to testing under the HPV Program.</p> <p>All HPV Data Submitted Was Publicly Available, Readily Retrievable, and Usable From the Very Beginning of the Program Some critics claim that the HPV Program failed to have continuous, real-time access to program status and results on the Internet. However, every commitment, every robust summary, every test plan, every piece of data submitted was publicly available and readily accessible on EPA's website from the very beginning of the program's existence. http://www.epa.gov/hpv/</p>
F-TA-16	<p>Perspective of Affected Industries on California Green Chemistry Initiative The below listed organizations appreciate the opportunity to provide comments on the California Environmental Protection Agency's (CalEPA) Green Chemistry Initiative. Our organizations represent many of California's and the nation's leading industries and employers. We fully support science and risk based chemicals management policies which protect health and the environment while assuring product safety and efficacy and promoting innovation in the marketplace in California.</p> <p>Chemistry is at the foundation of a wide range of industries. The science of chemistry helps to make the lives of Californians and others throughout the world safer, healthier, and more productive. Chemistry goes into modern materials used to make insulation, weatherization equipment, firefighting and other emergency response equipment, lightweight vehicle parts, coatings, lubricants, and energy-efficient appliances. Just a few of the many industries that use chemical or chemical-derived products include farming, new residential construction, emergency response services, plastic bottle manufacturing, electronics and high-technology, consumer products manufacturing, upholstered furniture manufacturing, dry cleaning services, building services and health care.</p> <p>We support the statement of CalEPA Secretary Linda Adams that this "...strategy, and the policy it champions, must have at its core and be governed by sound science." Advancements in science make possible product innovations that meet consumer needs, while increasing knowledge about the safety of chemical products and protecting the environment. A science-based assessment that evaluates human health and environmental considerations, performance, and cost and feasibility must include an examination of traditional and alternative technologies, materials and processes.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>Incentive-based approaches can allow companies to more easily and effectively share this knowledge, best management practices, and opportunities. Our industries and employees appreciate California's leadership in undertaking a comprehensive, scientific and risk based approach to this complex issue.</p> <p>Adhesive and Sealant Council American Chemistry Council AeA (American Electronics Association) American Sportfishing Association Association of Woodworking and Furnishings Suppliers California Chamber of Commerce California Circuits Association California Manufacturers and Technology Association California Paint Council Chemical Industry Council of California Consumer Specialty Products Association Flavor and Extract Manufacturers Association Fragrance Materials Association Grocery Manufacturers Association Independent Lubricant Manufacturers Association International Association of Color Manufacturers International Sleep Products Association IPC – The Association Connecting Electronics Industries National Association of Home Builders National Paint and Coatings Association NFIB – California Soap and Detergent Association Society of American Florists U.S. Chamber of Commerce</p>
F-TA-17	<p>Use of existing data and tools to implement the Green Chemistry Initiative DTSC should look at the procurement and / or contractual use of existing data and software tools to implement the Green Chemistry Initiatives for the short-term and long-term program needs. Previous posts have indicated various available existing chemical data systems and tools, including Chemical Compliance Systems, the Canadian efforts, and the European REACH program. Use of these types of tools could facilitate implementation of voluntary and/or regulatory programs in the near future as a beginning effort and establishment of a foundation, to be built upon in future developments, meeting the Green Chemistry initiative goals and objectives. One example of a potential use of existing tools is the establishment of a product "green" certification program which would allow consumers to readily identify green products. This type of program is already available via use of Chemical Compliance Systems data tools that can provide an automated "Green" assessment of chemical products which can be readily tailored for use in California. The use of such existing programs can provide efficiency through the avoidance of "re-inventing the wheel" and expanding on proven technologies and / or approaches.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	Through the procurement and / or contractual use of existing data and software tools, DTSC should establish programs and/or partnerships by which these types of tools and data can be made available to other stakeholders (such as product manufactures, business and private consumers, other government agencies, etc.) on a free or lower-cost basis for the purpose of meeting or promoting the Green Chemistry Initiative goals and objectives.
F-TA-18	<p>Feedback from Albemarle Corporation Toxics by Accident</p> <p>The basic classification of a given material can be addressed as described in the toxic by design section, but the important difference here is that the hazard presented by a material is not associated with the primary chemical, but with by products that are not integral to the materials function. In such a circumstance the opportunity for risk reduction by means of by product elimination should form an important element of ongoing risk reduction strategy. Where risks are unacceptable this has to be a part of the risk management program to bring risk within acceptable levels. Where risk levels are deemed acceptable, continued improvement can still be driven by procurement incentives.</p>
F-TA-19	<p>GMA's Perspective on a Framework for Green Chemistry</p> <p>The Grocery Manufacturers Association (GMA) represents the world's leading food, beverage and consumer products companies. The association promotes sound public policy, champions initiatives that increase productivity and growth and helps to protect the safety and security of consumer packaged goods through scientific excellence. The GMA board of directors is comprised of chief executive officers from the Association's member companies. The \$2.1 trillion consumer packaged goods industry employs 14 million workers and contributes over \$1 trillion in added value to the nation's economy.</p> <p>GMA appreciates the opportunity to participate in a dialogue on California's Green Chemistry Initiative with California's Environmental Protection Agency (CalEPA) and other interested parties. Our membership includes leading consumer products companies that produce safe consumer products that are protective of human health and the environment while improving the quality of life and protecting the public health against dangerous diseases, infestation, and unsanitary conditions.</p> <p>Green chemistry is sustainable innovation. It is built upon a foundation of companies using hazard and exposure analysis to address safety prior to marketing. It is about moving toward products with improved environmental quality that also improve performance and consumer value to better meet all consumer needs. It uses analytic tools such as life cycle assessment to guide real product improvement and to protect against burden shifting or regrettable substitution with unintended adverse consequences, such as occurred with MTBE.</p> <p>Background</p> <p>Our members are committed to thoroughly evaluating their products for human and environmental safety through rigorous safety-based assessments before they are marketed. Our members provide clear and meaningful labeling on consumer products to ensure that consumers use products in accordance with label instructions. Our members routinely apply green chemistry and green engineering principles in their operations and have been honored with awards for their efforts. The consumer products industry develops products that meet or exceed the safety requirements of all state and federal agencies in the United States and Canada charged with regulating those products, including the California Department of Pesticide Regulation, the California Air Resources Board, other state agencies, the U.S. Consumer Product Safety Commission, the U.S. Environmental Protection Agency, the U.S. Occupational Safety and Health Administration, the U.S. Food and Drug Administration, Health Canada, and Environment Canada.</p> <p>GMA supports initiatives that continue to foster innovation and encourage universities, educational institutions, and industry to partner in developing effective "greener" ingredients that reduce environmental impact. We support company performed safety-based assessments of consumer products prior to the marketing of a product, considering all phases of the lifecycle of a product. Any chemicals management program must be based on sound scientific risk assessment to protect public health and the environment, and we support appropriate use-restrictions for chemical ingredients when those scientific safety-based assessments indicate they cannot be used safely in consumer product or use application. We support initiatives by companies,</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>government and interested parties to promote consumer awareness of the importance of reading and following label instructions for safe product use, storage and disposal.</p> <p>We applaud collaborative efforts to encourage public and private partnerships, with a goal of developing greener products and environmentally responsible ingredients based on life cycle considerations, rather than mandatory and voluntary state labeling programs that endorse green products or programs that stipulate a single third-party certification of green products or numerical ranking. We encourage research that shows opportunities for the use of green chemistry in consumer products, as well as policies designed to overcome barriers to commercial application of green chemistry research and development efforts. We support initiatives that create incentives for innovative companies that develop greener products that are technologically and commercially feasible, and we encourage recognition for companies that develop sustainable business operations, processes and/or products.</p> <p>General Principles</p> <p>We believe that the Green Chemistry Initiative should ensure the safety of consumer products through the use of sound science in the decision-making process. It must foster innovation and encourage the development of new chemistry technologies. The Initiative should be designed to promote products that are technologically and commercially feasible to produce without compromising product efficacy, performance and usability. It should build on existing statutory and regulatory structures, voluntary initiatives and data development efforts. Finally, CalEPA should seek guidance from all stakeholder interests.</p> <p>Key Elements for the Green Chemistry Initiative</p> <p>We respectfully submit that the framework for the Green Chemistry Initiative should include the following elements:</p> <p>(1) A Systematic, Collaborative Process to Address Priority Chemicals:</p> <p>We support California's initiative to move beyond a chemical-by-chemical approach and build a more systematic, scientific and collaborative process to address priority chemicals. As Governor Schwarzenegger recently stated:</p> <p>"I strongly believe there needs to be a systematic way to address these types of concerns where California's scientists can work together with experts throughout the world to evaluate the health effects of chemicals, assess the risks they pose, and ensure that the safety of possible alternatives receives the same consideration."</p> <p>It is eminently sensible for California's collaborative effort to proceed in tandem with ongoing work by other government agencies assessing chemicals. The Canadian Government announced their Chemicals Management Plan on December 9, 2006. Numerous substances that have been in commerce for more than 20 years were assessed against rigorous scientific criteria. As a result of that process, Health and Environment Canada are now addressing priority chemicals as part of the Industry Challenge Program within the Chemicals Management Plan. Since Canada is undertaking this proactive approach for existing substances against the most modern science, we respectfully suggest that CalEPA collaborate with the Canadian government not only on the priority list of chemicals but the program in general. In our opinion, this collaboration would avoid needless duplication, inefficiencies and burdens, as well as take advantage of credible, high-quality scientific work already completed. This will help the government of California to meet its goals in a faster, more cost-effective way.</p> <p>Working with the Canadians and the Plan undoubtedly would foster greater results for the regulatory cooperation agreement for chemicals announced by the President and the leaders of Canada and Mexico this past summer. As part of the agreement signed in Montebello, the three countries agreed to share data, information and safety assessments so that all North Americans would have continued access to safe and effective products with improved sustainability and environmental quality profiles. With California's expertise at the table, collaborating with the agencies involved could accelerate the benefits of this effort across the North American region.</p> <p>As indicated in Governor Schwarzenegger's comment, it is important that California proceed with a science-based approach that focuses on key information, including toxicity and exposure of chemicals and possible alternatives, so that sound safety decisions can be made in the context of</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>scientific risk assessment. This process must be the tool for focusing resources and attention on a limited number of chemicals that are important to evaluate. The process should be collaborative and should include scientific experts in toxicity and exposure from academia, chemical manufacturers, product formulators, and nongovernmental organizations. The manufacturers of the chemicals and consumer products could provide toxicity and exposure/use data to determine whether the uses of “priority chemicals” are safe or should be restricted.</p> <p>(2) Ingredient Communication: Some consumers have expressed a desire to know what ingredients are in the products they use in their everyday life. These consumers are interested in having this knowledge in order to make informed product choices. We support providing accurate information to consumers through ingredient communication. Manufacturers of essentially every name-brand product have programs to respond to the information requests and needs of consumers. For example, we actively work with consumers who call our toll-free numbers or send emails. We are always looking for better ways to communicate. Some third party assessments and information available on the Internet or through literature searches can be inaccurate due to the reliance on sources or on assumptions that may not be as current as the information provided by the manufacturers or industry groups representing the products. Industry has the obligation and continues to improve the methods it uses to communicate product information to consumers, especially in its efforts to ensure the safe and appropriate use of the products. We would like to work with California to implement a means of ingredient communication that would provide consumers with the information they can use to make even better informed decisions regarding the products they use in their homes.</p> <p>(3) Product Safety Assessments: Our members are committed to thoroughly evaluating their products for human and environmental safety through rigorous safety-based assessments before they are marketed. We support the continual improvement of safety assessments and methodologies including conducting life cycle assessments to help understand the health and environmental footprint of products and possible alternatives through their lifecycle. Our members have staff that includes experts in toxicology and environmental science to work on these assessments. CalEPA could work with scientific experts to examine best practices and to develop a toolkit for safety assessment programs and for safety assessments. Companies also could make a description of their safety assessment process available on the Internet. This could help provide context for product ingredient communication. In addition to product safety assessments, companies could adopt programs to ensure the safety of raw materials and packaging, operations, storage and distribution, and the use and disposal of products.</p> <p>(4) Supporting Innovation: The Green Chemistry report argues that there is a need to close the “technology gap” through market-based incentives to support green chemistry. This could include funding for university research grants, scholarships, and similar programs, as well as awards for innovation, tax credits, low-interest loans, and other incentives. These positive incentives should be open to all companies that are innovators and sell products in California -- not simply be limited to companies located in California. * * * * *</p> <p>Chemicals are useful and essential ingredients for many products that protect public health and improve the quality of our lives. We appreciate the importance of a scientific approach based on an evaluation of hazard and exposure information to determine the safety of these products that improve the well-being of the public.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-20	<p>Bayer MaterialScience's Comments on California Green Chemistry Initiative</p> <p>At Bayer MaterialScience we share society's values of developing, producing and putting into the marketplace products that are both beneficial and safe for humans and the environment. We respect and support the objectives of Responsible Care® along with sustainable development as a commitment for management and as a responsibility shared by each employee.</p> <p>We at Bayer continue to address green chemistry objectives through innovation and product stewardship. Innovation is essential to driving green chemistry and sustainability in markets such as automotive, green building and alternative energy. Products and their uses are evaluated to help assure intended benefits to society while also protecting public health and the environment. We follow the American Chemistry Council's Responsible Care® program, with a management system that is certified by third-party auditors. We integrate knowledge of potential hazards of chemicals with an understanding of potential use and exposure in our risk management programs.</p> <p>We appreciate the California Green Chemistry Initiative's request for comments on the program and support an approach that addresses the following points:</p> <ul style="list-style-type: none"> • Look at the chemical information that is already available to California. • Make it clear that the Green Chemistry Initiative process will be governed by a risk-based science approach. • Support an understanding of both the benefits and the burdens of new regulatory proposals. • Consider process technology as part of a green chemistry program. <p>Look at the chemical information that is already available to California:</p> <p>We believe that California should consider existing data and information already available to California and the public before making judgments on additional chemical specific data and information needs. There are existing programs such as the High Production Volume (HPV) Challenge Program and the Extended HPV Program, which have provided valuable toxicology and exposure information that is publicly available. Hazard information from such sources can be used in light of exposure scenarios to evaluate potential risk and ensure appropriate risk management. In addition, the information from the recent evaluation and categorization of chemicals on the Canadian Domestic Substance List (DSL), Canada, should be considered by California.</p> <p>Make it clear that the Green Chemistry Initiative process will be governed by science with a risk-based approach:</p> <p>We believe that the Green Chemistry Initiative must be based on sound science with a risk-based and weight-of-evidence based approach. Objective and reproducible scientific methodologies are the keystones upon which regulatory policy should be based. Everything can be toxic at some level; the key is to minimize potential risks (risk = hazard x exposure). The Green Chemistry Initiative should be based on the principles of risk. That is, minimizing the use of toxics in light of the exposure scenarios, along with considerations of efficiency and economics.</p> <p>Support an understanding of both the burdens and the benefits of new regulatory proposals:</p> <p>To most efficiently use resources, we believe that consideration should be given to existing chemical management systems. Many existing regulatory and voluntary programs promote innovation and advances in chemical technology, govern areas of product life-cycle, and also promote pollution prevention and research into the use of less hazardous substances.</p> <p>We believe that the Toxic Substance Control Act (TSCA) is a comprehensive chemical management statute. Criticisms of the TSCA to protect human health and the environment often overlook the real need for resources to properly administer the statute. Without the proper staffing and financial resources, any regulatory program will have limited effectiveness.</p> <p>Innovation is critical to green chemistry. Rather than imposing regulatory burdens, innovation through green chemistry can be promoted with positive incentives and partnerships. Green Chemistry should be encouraged through the sharing of expertise, financial support for research, information exchange, and public education. Incentives could be offered for companies to pursue and foster Green Chemistry and Green Engineering.</p> <p>Consider process technology as part of a green chemistry program:</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>Green chemistry is an important consideration in efforts that lead to sustainable development, but it is only part of a potential solution. In a broader sense, green chemistry programs should include process technology considerations as alternative chemistry is being evaluated. This technology can have a significant impact on minimizing potential adverse health or environmental effects of a chemical substance. Process technology can reduce both human and environmental exposures to chemicals, for example, through enclosed systems, recycling of by-products, and controlling potential environmental releases. Use of these process technologies can eliminate the need for substitution of critical raw materials.</p> <p>In conclusion, we believe that a green chemistry initiative must be based on sound science, be risk-based, leverage validated existing health and environmental information, and consider engineering and processing technology. We feel that innovation and partnership with industry should be encouraged. Industry should be brought in as a critical stakeholder in this Initiative as it develops.</p> <p>On behalf of Bayer MaterialScience LLC</p>
F-TA-21	<p>Comments from Rohm and Haas Company</p> <p>The overall question of toxics in products has to be viewed against our understanding of what dose response curves look like at low dose. Current assumptions of multi-stage linear extrapolation from high dose toxicological testing may be causing undue concern and mis-direction of public health resources. California should support work to better understand what is happening at low dose and thereby more reasonable setting of quantitative risk guidelines to which products can be designed.</p>
F-TA-22	<p>P&G's Recommendations for Advancing California's Green Chemistry Initiative Procter & Gamble Suggestions</p> <p>The California Green Chemistry Initiative holds a lot of promise for expanding the principles of Green Chemistry, accelerating innovation and creating important health, environmental, social and economic benefits. Through the Conversation with California—workshops, symposia and Blog contributions—it's clear that there is broad interest and excitement about moving the state forward, both in improving protections for the environment and the health of Californians, and in creating a more sustainable future. P&G supports the State's objectives. Here are some ideas that California can consider to advance GCI.</p> <p>Priority Chemicals—California should establish a program to identify, assess and manage priority chemicals based on an evaluation of hazard and potential for exposure</p> <ul style="list-style-type: none"> - Move quickly by leveraging priorities identified in the Canadian Chemical Management Plan. Create a collaborative effort between California and Canada to accelerate progress in both geographies. - Include a means for adding and deleting priority chemicals based on unique California circumstances. - Leverage the recently assembled U.S. Inventory Update report to provide initial volume, use and exposure information. Identify uses and user industries for the high priority chemicals that raise the greatest concern. Expect producers of priority chemicals and manufacturers with high concern uses to provide hazard and exposure information on those chemicals/uses to the program. - Provide the agency with authority and a due process to establish restrictions for uses of priority chemicals that have unacceptable risks. - Facilitate informed substitution in moving to alternatives for restricted uses of priority chemicals - Organize this overall effort in a collaborative approach involving chemical producers, targeted users/industries, the agency and appropriate academic and other 3rd party experts. - Engage with US EPA and the recently announced Canada-US-Mexico Montebello Agreement to avoid duplication and expedite action on priority chemicals in California and throughout North America. <p>Product Safety Management Systems—California should expect and encourage manufacturers of consumer and commercial products sold in California</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>to employ comprehensive product safety management systems that include:</p> <ul style="list-style-type: none"> - Assessments to ensure the safety of products prior to marketing; - Rigorous control of production from raw material specifications, to formulation management, to process and quality control; - Safe operations that protect the health and environment of employees and the surrounding community; - Compliance with all applicable product safety, labeling and regulatory requirements including transportation, waste management and product disposal; - Constant vigilance in post market surveillance with rapid response to identified concerns; - Innovation that improves product performance, value and environmental quality based on life-cycle considerations; - Transparency in communicating information about safety management systems and products; and, - Ongoing evaluation and improvement of systems performance. <p>Animal Welfare—In pursuing the objective of the Green Chemistry Initiative to expand toxicology information on chemicals, California should encourage the use of alternatives to animal testing and require testing only as a last resort.</p> <ul style="list-style-type: none"> - The agency and UC university system could work with other experts to provide assistance on alternative screening methodologies that can be utilized to provide adequate toxicology information for recommendations and decisions about priority chemical uses. <p>Transparency—California should take the lead in expanding the amount and ease of accessing information on chemicals and product safety.</p> <ul style="list-style-type: none"> - Expect and encourage manufacturers of consumer products to communicate information about the ingredients in products, either on the package or on the internet at the manufacturer's discretion and with appropriate provisions for protection of Confidential Business Information. - Expect and encourage chemical and product manufacturers to update their MSDS's to the new 16-section ANSI standard and to reflect the latest hazard information from voluntary (e.g. HPV) and regulatory (e.g. Canada CMP) programs. - Encourage companies in important value chain sectors to work together to identify "beyond MSDS" information needs both upstream and downstream and to establish processes for communication to meet those needs. - Leverage California's capability and interest to assemble a chemical information system on hazard, use and exposure from global sources. <p>Stimulate Green Chemistry Innovation—California should prime the pump to initiate early and significant advancements in Green Chemistry and to recognize and reward success.</p> <ul style="list-style-type: none"> - Provide economic incentives for business innovation in green chemistry. - Provide economic support and incentives for innovation at California's University system: scholarships, research funds, technology licenses, etc. - Focus the above programs on development and commercialization of alternatives for restricted priority chemicals, including for small business application and on innovations that create breakthroughs in performance, value and environmental quality. - Develop a registry in which all stakeholders can document Green Chemistry successes - Develop an extension service through the UC university system to expand reapplication of successes across the potential user community. - Establish an Annual Green Chemistry Recognition program for new chemicals, products and processes and for advances in research, analytical and toxicological methods that best exemplify the objectives of GCI, - Continue the Conversation with California via ongoing workshops, symposia, and other communication approaches to maintain and build on the momentum established in the program to date. <p>November 15, 2007 Contacts: Bill Greggs, greggs.wj@pg.com Pat Hayes, hayes.pl.1@pg.com</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-23	<p>Green Chemistry Initiative Public Comments</p> <p>Fossil-fuel-based plastic use in our society continues to grow at an exponential rate, creating a plethora of environmental impacts for California, the oceans and, increasingly places like Lianjiao, China (see http://news.sky.com/skynews/video/videoplayer/0,,31200-greenbritain_china_p222,00.html). The State of California has one of the most impressive recycling mandates in the country but I am very concerned about where our recycling, especially our plastic, is going.</p> <p>Most consumers believe that their fossil-based plastic, once placed on the curbside for recycling has been taken care of in a way that renders any potential problems with plastic waste solved.</p> <p>Myself and my colleagues at Green Sangha have been working over the past 2.5 years educating the public regarding plastic waste issues including pollution in the ocean.</p> <p>The central Pacific Gyre contains a plastic waste mass that has been measured to be larger than the state of Texas. Because plastic does not biodegrade, plastic entering the oceans remain there unless it is deposited on a distant beach. Fossil fuel-based plastic has entered the marine food web at many trophic levels impacting countless marine species (birds, salps, marine mammals, etc...please see: http://www.algalita.org/pelagic_plastic_mov.html)</p> <p>Small bits of plastic in the central Pacific Gyre outweighs zooplankton at a ratio of 6:1 (six pound of plastic for every pound of plankton!), according to research published by the Algalita Marine Foundation.</p> <p>Of greatest concern for my organization and me right now is what is happening to our plastic waste once it leaves the US shores not as litter but as commerce.</p> <p>At the link, http://news.sky.com/skynews/video/videoplayer/0,,31200-greenbritain_china_p222,00.html please find some news footage shot by Sky News in the UK. This news story highlights the situation that Californians don't know about and never see. It is the story of the dark side of plastic downcycling that all policy makers need to see, we believe.</p> <p>This short news piece is of great importance regarding plastic policy here in California. The plastic industry continues to repeat the mantra that plastic is fine; we must continue to use it but we need to do a better job recycling.</p> <p>I'd like the Green Chemistry Initiative to first acknowledge that fossil plastic is downcyclable not recyclable. And that most of our fossil plastic waste is being shipped overseas and being handled under conditions that are harming water, air, public health and the land surrounding so-called recycling facilities.</p> <p>In the video workers are exposed to mountains of unsanitary plastic waste. They melt it down and/or burn it; smoke and ash fills the air. Untreated polluted water runs into local streams turning them dark grey; they too are littered with plastic and ash. Workers are subjected to toxic fumes and heavy metals where PVC is downcycled without any idea that their work is dangerous.... Needless to say, there are no health or environmental standards in places such as Lianjiao, China.</p> <p>Our continued embrace of plastic needs to be looked at with a cradle-to-cradle perspective, which requires a close look at what is happening overseas. The Green Chemistry Initiative is for California, but for the initiative to have integrity in cannot be part of exporting waste that is causing great harm overseas. We in California need to develop closed-loop safe and just ways of handling our waste. The current model of exporting plastic to countries such as China needs to be stopped if California is serious about its Green Chemistry Initiative.</p> <p>Andy Peri Green Sangha</p>
F-TA-23	Further information provided: a link to the short online version of the video described above and some articles regarding waste exports to China.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	on behalf of Andy Peri
F-TA-24	<p>Green Chemistry and Beyond: Sustainability, Safety and Continual Improvement GREEN CHEMISTRY AND BEYOND: SUSTAINABILITY, SAFETY AND CONTINUAL IMPROVEMENT</p> <p>INTRODUCTION Earlier this year, California kicked off its Green Chemistry Initiative with the stated goal of taking a collaborative approach to significantly reduce the impact of toxic chemicals on public health and the environment. The Soap and Detergent Association provides the following comments on behalf of its members so that California may consider new ways to manage chemicals towards the continual improvement of public and environmental health. The Soap and Detergent Association (SDA) is the non-profit trade association representing manufacturers of household, industrial, and institutional cleaning products, their ingredients and finished packaging; oleochemical producers; and chemical distributors to the cleaning product industry (http://www.cleaning101.com/). SDA members produce more than 90 percent of the cleaning products marketed in the U.S. SDA members strive to meet the commitments of a sustainable industry: 1) advancement of social well-being, 2) advancement of human health and environmental quality, and 3) economic growth. Cleaning products have been an integral part of the dramatic advancements in public health and longevity, and the decline of communicable diseases throughout the world over the past two centuries. SDA and its members have been at the forefront of research on the environmental and human-health safety of their products for the past 50 years, and a culture of innovation and continuous improvement among its members has resulted in a robust industry that is a leading contributor to the public health across the country.</p> <p>SUSTAINABILITY Social Sustainability SDA members are committed to contributing to a better quality of life for our consumers, business partners, employees and the communities in which we operate, and to maintaining a high level of product stewardship throughout the chain of commerce. As such, we believe that decisions of preferability and substitution should be based on the comparative life cycle impacts of a chemical and its potential substitute. While a safety-based characterization scheme may focus on toxicity, persistence and bioaccumulation, there are a number of other parameters which are relevant to the sustainable use of a particular chemical in a formulation such as raw material sourcing and carbon footprint. All relevant aspects of sustainability should be taken into consideration for a potential substitution decision. Similarly, any plan to consider substitution of chemicals should require that the efficacy and benefits of that compound be considered as any diminution of efficacy may negatively impact public health and well-being through reduced hygiene and sanitation.</p> <p>Environmental Sustainability Cleaning products are chemical formulations, and generally each ingredient in a formulation will have some measurable toxicity. However, the use of cleaning products generally is well understood, leading to sound characterizations of exposures and risks. SDA members are committed to the enhancement of human health and quality of life through the responsible formulation, production and sale of cleaning products and ingredients, and their proper use. SDA members only market products that have been shown to be safe for humans and the environment, through careful consideration of the potential health and environmental effects, exposures and releases that will be associated with their production, transportation, use and disposal. In determining the safety of cleaning products, toxicity of ingredients to humans and wildlife is studied.</p> <p>Economic Sustainability The cleaning products industry is an important component of this nation's public health infrastructure and a contributor to the nation's economic well being. As such, it is important that the Green Chemistry Initiative not compromise this industry. SDA members are committed to innovating to improve products both in terms of performance and environmental impact. The Green Chemistry Initiative must ensure that product efficacy, performance, and usability are not undermined, and that the ability to innovate is not compromised. In fact, California is uniquely well positioned to foster innovation in</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>Green Chemistry and product formulation. With a strong educational system including world-class research university and a robust high technology sector, California has the means to lead the world in developing and commercializing alternatives to high priority chemicals of concern. The Green Chemistry Initiative should include a significant component related to research and development of alternatives for high priority chemicals which leverages California's intellectual resource. Through such efforts, California could facilitate the development and application of chemicals that will reduce negative impacts to the citizens of California.</p> <p>SUGGESTIONS FOR CALIFORNIA</p> <p>Confirming the Baseline Safety of Chemicals in Commerce</p> <p>In order to affect the impact of toxic chemicals on public health and the environment, the inherent hazards and potential for exposure should be integrated into a risk framework, and risks should be managed appropriately. Currently, there are several national and international programs designed to evaluate and manage the risks of chemicals. California should leverage existing efforts and customize results to meet their needs. For example, in Canada, Environment Canada completed a prioritization exercise of 23,000 chemicals on their Domestic Substances List (DSL) in 2006. Using information from Canadian industry, academic research and other countries' data, Government of Canada scientists worked with partners in applying a set of rigorous tools to the 23,000 chemical substances on the DSL. They were categorized to identify those that were: inherently toxic to humans or to the environment and that might be persistent and/or bioaccumulative, and substances to which people might have greatest potential for exposure. From this exercise there were over 4,000 chemical substances identified as needing further attention, and about 19,000 (over 80% of the total) were set aside as not needing further action based on their hazard and exposure profiles. Among the chemicals needing further attention, 500 were high priority, 2600 were medium priority and 1200 were low priority, and most of the low priority chemicals were eliminated from consideration. Additionally, about 150 of the high priority chemicals were determined to not be used in Canada and were restricted from further use without an evaluation. In the end, Canada has moved forward to consider about 350 high priority chemicals and 2700 medium priority chemicals.</p> <p>California could focus on the 500 high priority substances identified in Canada's program. To address unique circumstances that might exist in California, the State could have a process to add substances to the high priority list, as necessary, based on hazards, uses and exposures to workers and consumers in California. Once the high priority chemicals are identified, use and exposure should be considered to determine whether there are impacts on human health and/or the environment. The State could work in coordination with other North American initiatives (e.g., Canadian Domestic Substances List prioritization, EPA and OECD High Production Volume Chemical programs, Security and Prosperity Partnership (SPP) of North America Regulatory Cooperation Framework) in order to assess the risks of the highest priority chemicals. In undertaking such programs, SDA urges the State to proceed with any chemical assessments in a manner that would avoid unnecessary animal testing. In cases where real impacts exist, risk management strategies should be implemented in order to reduce those impacts, including use-specific restrictions where there are unacceptable risks.</p> <p>Continual Improvement of the Safety Profile of Chemicals in Commerce</p> <p>California can continually improve the safety profile of chemicals in commerce in the State by focusing on the high and medium priority chemicals in use, and using Green Chemistry and other tools to facilitate informed substitution with chemicals having an improved safety and life cycle profile. There are a number of opportunities for California to apply its resources towards traditional Green Chemistry activities. California could leverage the universities in the State and the high-tech business sector towards the development of alternative chemicals for those of the highest priority, and development of alternative manufacturing processes for those with high discharges of hazardous waste. For alternatives identified, there should be a separate Life Cycle Assessment by an outside party, or state-funded Center for Excellence in order to confirm that there is no loss in performance with the alternative, to avoid unintended consequences, and to assist in commercialization. The State also could develop a Cooperative Extension-type program to assist companies in Cradle-to-Cradle product design/formulation and assist in adoption of new alternative chemistries and processes. In order to facilitate informed substitution of high priority substances towards those with a more favorable environmental and human health profile, the</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>State could develop database of chemical alternatives that compares a number of sustainability parameters: performance, price, human health and environmental (e.g., toxicity, bioaccumulation, persistence) including carbon footprint and source sustainability. Additionally, the State could map the flow of chemicals in California using information drawn from existing sources such as EPA's Inventory Update Reporting (IUR), the data received by Canada during its data call-ins for high priority chemicals, and other contributions from the public. In order to assess the performance of these programs and measure the impact of these reforms, the State should monitor metrics that will assess releases of chemicals to the environment and exposure to humans.</p> <p>Increased Transparency and Access to Information on Chemicals in Commerce California could expand access to information on chemicals for consumers, businesses and regulators by leveraging its preeminence in data management and mining in order to organize the world's chemical data. For example, the dossiers for the EPA High Production Volume (HPV) Chemical Challenge program, and the related European program are often difficult to find and the data difficult to extract. By partnering with the information technology sector (e.g., Internet search firms), the State could expand access to chemical information, support its local industry and raise awareness of chemical safety information currently available. Additionally, California could expand product-specific chemical ingredient disclosure for consumer products which currently do not have that requirement. To increase transparency and improve the management of chemicals in the workplace, California should adopt the 16-section Material Safety Data Sheet (MSDS) described by ANSI Standard Z400.1-2004.</p> <p>Recognition and Rewarding Success As California's Green Chemistry Initiative unfolds, it will be important to recognize efforts and reward successes. The State could establish a registry for companies seeking to align their business practices with the Green Chemistry principles and acknowledge their intent. Similarly, the registry could accumulate examples of product development decisions and substitutions that have resulted in reduced waste produced and energy inputs. The registry could be the basis for recognition of successes in reducing impacts from chemical exposures similar to the Presidential Green Chemistry Challenge Award, but focusing on results achieved through implementation of a program or application of a new chemistry rather than development of a new technology.</p> <p>SUMMARY California's Green Chemistry Initiative should emphasize all three components of sustainability: the social benefits of chemicals and products, the economic contributions through innovation and improved performance, and the environmental and human safety. California can confirm the baseline safety of chemicals through a prioritization based on hazard and exposure, assessment of risk, and management of risks including use-specific restrictions where necessary. California can drive innovation, the benefits of products and the continual improvement of the safety profile of chemicals by leveraging the State's expertise, and applying resources to the application of Green Chemistry research and development. California can expand access to information on chemicals in order to improve decision-making by taking advantage of their data management industries to organize the world's chemical data, and by increasing the disclosure of chemical ingredients in consumer products. Once California has implemented its Green Chemistry Initiative, it should recognize the efforts of those industries seeking to apply the principles of Green Chemistry and provide recognition to those that have had notable success.</p>
F-TA-25	<p>The Green Chemistry Initiative Should Consider Voluntary Programs and the Concepts of Sustainable Chemistry Government has not been the sole repository of efforts to promote green chemistry. The Green Chemistry Institute (GCI) was incorporated in 1997 as a not-for-profit entity to promote and advance green chemistry. In January 2001, GCI joined the American Chemical Society (ACS) in an increased effort to address global issues at the intersection of chemistry and the environment. The twelve recognized principles of green chemistry are as follows: The Twelve Principles of Green Chemistry</p> <ol style="list-style-type: none"> 1. It is better to prevent waste than to treat or clean up waste after it is formed. 2. Synthetic methods should be designed to maximize the incorporation of all materials used in the process into the final product.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>3. Wherever practicable, synthetic methodologies should be designed to use and generate substances that possess little or no toxicity to human health and the environment.</p> <p>4. Chemical products should be designed to preserve efficacy of function while reducing toxicity.</p> <p>5. The use of auxiliary substances (e.g. solvents, separation agents, etc.) should be made unnecessary whenever possible and, innocuous when used.</p> <p>6. Energy requirements should be recognized for their environmental and economic impacts and should be minimized. Synthetic methods should be conducted at ambient temperature and pressure.</p> <p>7. A raw material feedstock should be renewable rather than depleting whenever technically and economically practical.</p> <p>8. Unnecessary derivatization (blocking group, protection/deprotection, temporary modification of physical/chemical processes) should be avoided whenever possible.</p> <p>9. Catalytic reagents (as selective as possible) are superior to stoichiometric reagents.</p> <p>10. Chemical products should be designed so that at the end of their function they do not persist in the environment and break down into innocuous degradation products.</p> <p>11. Analytical methodologies need to be further developed to allow for real-time in-process monitoring and control prior to the formation of hazardous substances.</p> <p>12. Substances and the form of a substance used in a chemical process should be chosen so as to minimize the potential for chemical accidents, including releases, explosions, and fires.</p> <p>The terms sustainable chemistry and green chemistry/engineering may be viewed by some as interchangeable. Green chemistry is often defined by the twelve principles of green chemistry developed by Anastas and Warner (referenced above). Equally important to the chemical industry are the principles of Green Engineering developed by Anastas and Zimmerman, which highlight the need for processes developed under the principles to be economically feasible. Sustainable chemistry builds upon the principles of green chemistry and engineering by going a step further and integrating economic viability and social benefits.</p> <p>Sustainable chemistry focuses on the end application or service delivered comparing all of the potential options (materials and processes) across the full life-cycle, and not just the process to make a particular chemical substance as with green chemistry and engineering. This requires a much longer term view (decades) than is common today. Also, those products which meet important needs of society are clearly more beneficial from a sustainable chemistry perspective. For example, using plastic to provide water pipe that delivers safe drinking water is more beneficial to society than providing hula hoops.</p> <p>Sustainable chemistry is not only about maximizing efficiency, minimizing risk, and reducing environmental impact, analogous to green chemistry and engineering, it's also about ensuring social benefit and economic viability for the applications and services delivered across the full life cycle of those products. Sustainable chemistry is not an endpoint, but a journey of continuous improvement, that can bring tremendous benefits to society if done well. These voluntary programs should be reviewed to see if some of the mechanisms they employ might have a place in the Green Chemistry Initiative. Clearly voluntary efforts are underway to advance both Green Chemistry and/or Sustainable Chemistry. DTSC may be able to replicate some of the valuable lessons learned in these programs, including adoption of incentives that best motivate greater use of Green and Sustainable Chemistry.</p>
F-TA-26	<p>Making the California Green Chemistry Initiative Workable</p> <p>The California Green Chemistry Initiative (GCI) is an innovative mechanism with the potential to influence the design of products in ways that reduce the use of harmful chemicals and generate less waste and pollution. The objective to create partnerships between industry, the public, and government agencies to bring about this change represents an interesting social experiment. The success of such partnerships will surely rest upon the ability to simultaneously meet the competing needs of all stakeholders. Chemical Compliance Systems, Inc. (CCS) believes we have unique resources that can effectively assist California result in successfully establishing GCI partnerships.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>CCS has compiled the largest and most accurate relational hazardous chemical/product and regulatory databases in the world over the past 22 years. These unique databases have been derived from over 1,000 sources and are currently comprised of approximately 75,000,000 data elements for 210,000 chemicals, 350,000 products and munitions, and 650 local, state, federal, international and nongovernmental organization regulations. These databases are maintained current, expanded on a daily basis, and are constructed to facilitate utilization of discrete elements in a wide spectrum of analytical compliance systems. CCS has currently developed 13 nonmunition and 10 munition Web-based analytical compliance software modules that utilize different elements from these databases and could immediately be implemented, or easily be customized, to support GCI requirements/needs. In addition, CCS has developed eight detailed concepts that will apply to more broadly defined GCI considerations.</p> <p>CCS has been working to “green” products and the environment for nearly 10 years. We currently have four separate, but equivalent, Web-based “green” analytical compliance systems for chemicals, products, processes and munitions. Each of these four modules utilizes the same 43 specific ecological, health and safety criteria to quantitatively evaluate the “greenness” of a chemical, product, process (including wastestreams), or munition. Each of these systems also includes alternative product/process constituent chemical data tables to facilitate the selection of a less harmful ingredient. In combination, the “green” product/munition and process modules provide a complete life cycle (i.e., “cradle to cradle”) analytical capability. Each has product design and evaluation capabilities that enable chemists/engineers to design “greener” products/processes upfront, and acquisition, regulatory and ecological/health/safety professionals to assess, or compare, the “greenness” of the overall product/process (wastestream) to the level of detail they require. Each of these modules also simultaneously identifies the regulatory impact of the overall product/process, parts or components, or individual constituents. These tools will enable California regulatory agencies to partner with industry and the public to establish objective and quantitative “green” standards, or performance measures, for products and processes that can be incrementally increased over time and apply fairly to both small and large companies. The utilization of harmful chemicals will be reduced and less waste and pollution will be generated. The “green” standard will be a known, level playing field for industry, and the result will be greater protection for workers, the public, and for the environment. These “green” capabilities have also been incorporated into a Web-based Chemicals of Concern module that can quantitatively rank the concerns for a chemical/product inventory at a facility, thereby focusing alternative chemical acquisition, or research, on the worst offenders first, effectively accelerating pollution prevention.</p> <p>CCS regulatory compliance capabilities draw upon our List of Lists data that currently includes 650 state, federal, international, and nongovernmental organization lists and associated data. Our Web-based compliance capabilities are available as standalone modules, or incorporated into other analytical tools (as described above). Compliance assessments can be applied to facility inventories, products/processes, waste classification, and/or CERCLA/RCRA site remediation. CCS is scheduled to develop a new, Web-based Health Risk Assessment module for the U.S. Army that will utilize our existing, Web-based Conceptual Site Model, and simplify RCRA Subpart X and CAA Title V Permit applications.</p> <p>Finally, CCS has conceptualized a Chemical Homeland Security System (C-HoSS) that will utilize existing facility chemical/product inventories to quantitatively rank resident chemical hazards, security risks and mortality risks by location at the facility. These three reports quickly prioritize inventory concerns. Entry of container accessibility constraints (i.e., storage conditions that control access) for chemicals of greatest concern enables C-HoSS to rank container vulnerabilities and identify accessibility requirements to nullify all vulnerabilities. C-HoSS concern levels are made proportional to the Homeland Security Advisory System daily risk levels. C-HoSS addresses all four levels in an effective security program (i.e., vulnerability assessment, corrective strategy, third party verification, and management system incorporation). C-HoSS will be a good tool for effectively eliminating terroristic chemical vulnerabilities at a facility. In addition, C-HoSS could have direct utility for preparation of California permit-required Security and Emergency Response Plans. Implementation of C-HoSS across the entire State of California can be accomplished “free,” utilizing a state grant for “equipment” from the Department of Homeland Security.</p> <p>CCS hereby offers to provide a remote demonstration of our existing Web-based capabilities and detailed concepts, at no charge, to any parties interested in their potential utilization in support of the California GCI, to achieve corporate “green” objectives, or to utilize in “green” product acquisition.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-27	<p>Measuring the Greenness of Products My name is George Kopcsak. I am the former Deputy for Munitions in the Office of the Secretary of Defense. During that time efforts were initiated to accelerate the demilitarization (DEMIL) of approximately 1 million tons of old, outdated, unstable and/or incompatible munitions in our nation's stockpile. Initially this was accomplished through open burn and open detonation techniques. More recently there has been much focus on more environmentally friendly means to destroy munitions or to recycle the components. Some of this work is done within the state of California.</p> <p>Within the past decade a small business organization, Chemical Compliance Systems (CCS), has developed a metric to determine the environmental impact when differing DEMIL techniques are utilized. This metric is called the Green Munitions Analytical Compliance System (G-MACS) and was sponsored and initially funded by the US Army. I'm happy to say that this tool now exists on the web. Since this tool evaluates the ecological, health and safety risks associated with munitions by breaking each down to the chemical level I have learned that the tool can also be used by munitions designers and producers to evaluate the environmental impact of specific chemicals used to make the devices. The designer now has a tool to change specific components within a munition design and determine its positive impact on the "Greenness" of the design. The idea can now be carried forward to look at designing munitions to ease the environmental impact of its anticipated DEMIL 20 years down the road.</p> <p>Since CCS has focused on munitions at the chemical level they have been able to broaden their "compliance system" tools looking at any and all products being designed, produced, or destroyed as long as the chemical composition is known. This looks like a good fit with the California Green Chemistry Initiative. I believe that you should seriously consider its use.</p> <p>As a final note, the web-based CCS tools (G-MACS, GP-CAS, and G-MACS) appear to have the capacity to look at chemical compatibility issues related to their close proximity with a product design. This may well become important when one considers the environmental impact of munition/product aging or temperature cycling.</p> <p>Please give these tools a look.</p>
F-TA-28	<p>Dow Chemical's Comments on Chemical Management Systems The Dow Chemical Company (Dow) appreciates the opportunity to provide additional comments on a recent discussion initiated by the California Environmental Protection Agency on chemicals management policy. As a company providing products and services in over 175 countries, we comply with a broad range of chemical management policies and programs. Dow supports a consistent, coordinated regulatory environment for products at global, national and regional levels to complement industry voluntary efforts and to ensure a level playing field. Where new regulations are required, they should be based on established scientific risk assessment and risk management principles – predictable, flexible and capable of responsibly addressing society's economic, environmental and safety requirements. We recognize that regulatory systems will inevitably vary by country since they must work effectively within the broader statutory and regulatory framework for each country. Nevertheless, we generally support broad regional programs that provide the greatest consistency and uniformity for the industry as a whole.</p> <p>As a result, Dow is not an advocate for any particular program. Instead, we have developed a set of principles for effective chemical management programs. As governments select specific legislative or regulatory approaches to product safety or chemical control policies, we believe that certain principles should be adhered to, and we present them below.</p> <p>on behalf of Dow Chemical Company</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-29	<p>BSEF's Chemical Policy Recommendations The Bromine Science and Environmental Forum (BSEF) is pleased to offer the following recommendations to the California Department of Toxic Substances Control (DTSC) for your consideration in developing and implementing the Cal-EPA Green Chemistry Initiative.</p> <p>Summary: The guiding principle for this proposal is that it relies on successful management of chemicals already in the marketplace according to their characteristics and actual uses, rather than simply banning substances. This focus recognizes the important difference between risk and hazard, i.e., that hazardous substances properly managed may not pose actual risks, and would create a system that is based on successful management of identified risks, as opposed to establishing prohibitions based on potential hazard.</p> <p>on behalf of the Bromine Science and Environmental Forum (BSEF)</p>
F-TA-30	<p>Real risk There was a recent article in the Detroit Free Press which got the point of risk—hazard PLUS exposure—and then ignored it. It reported the release of a study by activists that indicated all (35) test subjects had certain chemicals in their body “though none at levels posing immediate health concerns”. The story later quotes an activist stating that “The point is not the levels....” Well of course it is. Everything is harmful at some dose level. Any new chemical regulatory program has to revolve around not only the ability to detect ever smaller levels of chemicals but at what level the presence of a chemical poses a real risk to health. Some of this information is known or will be known as more testing is done for other programs inside and outside the US. There may be gaps in the ongoing range of testing unique to California and perhaps the state could identify those gaps and establish a targeted risk assessment program to fill them. Setting some priorities based on real science—not political science—and then assessing real risks makes sense. If such risks are identified, there are a number of ways to manage those risks, ranging from employing green chemistry innovation to reduce chemical presence in and exposure from products, to green engineering to reduce exposure from manufacturing processes to, in extreme cases, outright restrictions on specified chemical use. Green chemistry innovation has an inherent role to play in reducing risk and improving products that enhance our quality of life. But the real risks must first be identified.</p>
F-TA-31	<p>Automated, Web-Based Assessment of “Green” Chemicals, Products and Processes for Procurement Rutgers University purchases thousands of chemicals and products for use in hundreds of buildings throughout our three campuses. We have implemented comprehensive acquisition processes to assure that the products we purchase are manufactured and distributed in compliance with all applicable laws and Rutgers standards. In the past six months, I have become aware of the Web-based “Green” Product Compliance Analytical System (GP-CAS) and the “Green” Process Analytical Compliance System (G-PACS) developed by Chemical Compliance Systems, Inc. (CCS). These two, quantitative, Web-based systems have been incorporated into a third party cleaning product certification program by the Chlorine Free Products Association (CFPA). Together, GP-CAS and G-PACS evaluate the entire life cycle of a product. Rutgers University is currently in discussions with CFPA and CCS about the possibility of incorporating these capabilities into our chemical and product acquisition processes. California may find these existing Web-based capabilities applicable to the objectives of your Green Chemistry Initiative. They certainly have the potential to achieve a voluntary product certification program that could increase the application of available chemical hazard information in a way that reduces labor and cost requirements for both the State and industry, while increasing the protection of the public and the environment.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-32	<p>Dow Chemical's Comments on Educational Programs</p> <p>The Dow Chemical Company (Dow) is pleased to provide the attached paper on the role educational programs could play in California's Green Chemistry Initiative (GCI). We have appreciated the open, collaborative environment utilized for this process and have taken advantage of opportunities to participate in a variety of ways.</p> <p>Attached is a brief paper on educational programs where Dow has been engaged with the objective of improving science education and understanding of sustainability. This is intended to catalyze DTSC's thinking about the role education can play and the types of programs to consider. Dow believes that education must play a key role in California's Green Chemistry Initiative for the effort to reach its full potential.</p> <p>on behalf of the Dow Chemical Company</p>
F-TA-33	<p>Understanding TSCA Sections 4 and 6</p> <p>At several of the Green Chemistry Initiative stakeholder meetings held over the past few months, and in several entries in the "Conversation with California," the U.S. Federal Toxic Substances Control Act (TSCA) has come under attack. Some have suggested that the law provides no basis for California to assume that health and the environment have been protected from unwanted or unnecessary chemical exposures. In fact, some say that the U.S. Environmental Protection Agency (EPA) is unable to ban chemicals.</p> <p>California's Department of Toxic Substances Control (DTSC) is going to make recommendations on chemical regulatory matters as a result of the Green Chemistry Initiative. Some of those recommendations may include additional regulatory programs, actions that the legislature should consider, and some will likely be related to how the state drives a "green chemistry" approach through policy and the marketplace. As far as I know, no one is suggesting that California simply rely on the U.S. EPA and TSCA when it comes to chemical regulatory decisions. But it is important that Californians understand that the Toxic Substances Control Act provides an effective chemical management system, so that the state does not duplicate effort or waste scarce resources.</p> <p>Some of the misperceptions about TSCA involve EPA's testing authority under Section 4. Some claim that the law imposes too great a burden on the agency, making it difficult for EPA to justify issuing test rules. The truth is EPA only needs to meet a modest burden to support a test rule on a chemical. The law only requires EPA to show that a substance MAY present an unreasonable risk, or MAY reasonably be anticipated to enter the environment in substantial quantities, or that there is or MAY be significant or substantial human exposure. EPA has even said that when it considers whether a chemical "may present" a hazard, it does not require definitive scientific data, but of necessity looks to reasonable scientific assumptions, extrapolations, and interpolations.</p> <p>EPA has even stated that it only need to establish that exposure MAY arise because of activities associated with the manufacture, use, etc. of the chemical. Federal courts have ruled that EPA can rely on the mere POTENTIAL for human exposure in deciding whether a chemical "may present an unreasonable risk."</p> <p>Section 6 of TSCA gives EPA authority to regulate the manufacture, processing, distribution, use, or disposal of a chemical if the agency has a "reasonable basis" to believe the chemical "presents or will present an unreasonable risk to health or the environment." Section 6 identifies various regulatory options—from an outright ban to warning and labeling requirements—and provides that EPA may impose one or more of the listed requirements "to the extent necessary to protect adequately against such risk using the least burdensome requirement." That was Congress' way of telling the agency to take the most efficient regulatory approach consistent with the potential threat to health and the environment.</p> <p>When acting under Section 6, EPA must, among other elements, take into account the health and environmental effects of the substance, the magnitude of exposure, the benefits of the substance, the availability of substitutes, and the reasonably identifiable economic consequences of the proposed rule. Some say that EPA can't regulate effectively under Section 6 because of a federal court decision that overturned an EPA ban on certain asbestos-containing products. Critics like to say, "If EPA cannot ban asbestos, then what can it ban?" The truth is that EPA's failures in the asbestos regulation</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>were not deficiencies in the statute, they were failures in implementation. Simply put, EPA did not do what Congress told it to do. The fact is, EPA has used Section 6 rulemakings since the asbestos case was decided, albeit not very frequently, largely because TSCA provides multiple authorities for EPA to achieve its desired risk management results.</p> <p>TSCA critics want to suggest that these perceived failings in the federal statute should persuade California that the state must step in to correct these “deficiencies,” by establishing its own chemical regulatory system, among other approaches. The fact is, TSCA is protective of public health and the environment. There may well be important opportunities to improve the timing, quality and transparency of EPA’s chemical management decisions, and important opportunities to enhance the level of cooperation and coordination between the California and U.S. EPA.</p> <p>Which leads back to one of the fundamental questions that the Green Chemistry Initiative needs to grapple with—what is the problem that needs to be addressed?</p>
F-TA-34	<p>In claiming that TSCA Sections 4 and 6 work well and are easy for EPA to use, Mike Walls of the American Chemistry Council (ACC) omits or glosses over key aspects of what EPA must do to use these authorities. I address some of these below.</p> <p>But first consider that the real proof of the effectiveness of these provisions is, as they say, in the pudding:</p> <ul style="list-style-type: none"> • Over the 30 years TSCA has been in effect, EPA has succeeded in issuing test rules or enforceable consent orders under Section 4 for fewer than 200 of the many tens of thousands of chemicals that have been in commerce over that same period. • Over that same period, EPA has succeeded in restricting only five chemicals (and then, only certain uses or occurrences of them) using its Section 6 authority: <ol style="list-style-type: none"> 1. PCBs (accomplished through an additional statutory mandate); 2. fully halogenated chlorofluoroalkanes used as propellants in aerosol spray containers (superseded by a ban under the Montreal Protocol); 3. the removal for disposal of certain wastes containing dioxin at a specific site in Arkansas; 4. asbestos, but limited to products no longer in commerce, because the initial rule was vacated by U.S. courts after legal challenge (see more below); and 5. hexavalent chromium-based water treatment chemicals for use in comfort cooling towers. <p>Here’s some of what Mike left out in his discussion of TSCA Section 4 test rules: To require testing of a chemical under Section 4, EPA must issue a rule using full notice-and-comment rulemaking. It can do so only if it makes a number of findings, not just one as Mike claimed. EPA must find, based on sufficient evidence, that:</p> <ul style="list-style-type: none"> • the substance “may present an unreasonable risk,” based on evidence of more than a theoretical risk of exposure, <p>OR:</p> <ul style="list-style-type: none"> • it is or will be produced in “substantial” quantities and either: <ul style="list-style-type: none"> o it is entering or may enter the environment in “substantial” quantities, or o there is or may be “significant or substantial” human exposure to the chemical, <p>AND:</p> <ul style="list-style-type: none"> • insufficient information exists to assess potential risk, <p>AND:</p> <ul style="list-style-type: none"> • testing is necessary to develop the needed data. <p>Making the latter two findings is non-trivial; each requires substantial time and resources and is frequently the basis for challenges by industry (ACC members among them) during the comment period for a proposed rule, and sometimes via lawsuits brought against the Agency after a final rule is issued.</p> <p>EPA itself has noted that using its Section 4 authority is difficult and imposes substantial burdens, for a number of reasons. In practice, EPA says it</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>rarely has enough information to make the “may present an unreasonable risk” finding, and instead is usually forced to rely on making the exposure-based finding. But EPA reports that obtaining the requisite exposure information needed for rulemaking is particularly difficult. EPA also indicates that finalizing rules under Section 4 can take from 2 to 10 years and require the expenditure of substantial resources – resources that are in increasingly short supply as its budget has been declining. (EPA provided these comments to the Government Accountability Office, and they are discussed in GAO’s 2005 report, Options Exist to Improve EPA’s Ability to Assess Health Risks and Manage Its Chemical Review Program, pp. 25-26, at http://www.gao.gov/new.items/d05458.pdf, and GAO’s 1994 report, Toxic Substances Control Act: Legislative Changes Could Make the Act More Effective, pp. 45-47, available at archive.gao.gov/t2pbat2/152799.pdf.)</p> <p>Two examples:</p> <ul style="list-style-type: none"> • EPA has succeeded in issuing one test rule covering only 16 of the more than 250 unsponsored chemicals under its voluntary HPV Challenge Program. That rule took more than 5 years to promulgate. Proposal of a second rule that will cover only about 40 more unsponsored HPV chemicals is already years late. EPA will not be able to require testing for many of these unsponsored chemicals because it cannot make the requisite findings. • In 1991, OSHA identified 658 chemicals for which it needed data on dermal (skin) absorption due to potential worker exposure, and requested that data be developed for them using a relatively inexpensive in vitro test. OSHA cannot itself require companies to test chemicals, and must instead request that EPA do so using its Section 4 authority, as it did in this case. Eight years later, EPA proposed a test rule covering 47 of these chemicals, because these were the only ones for which EPA could make the required Section 4 findings. This proposed rule was heavily challenged by industry, with the result being that the final rule covered only 34 chemicals and was not issued until 2004 – 13 years after identification by OSHA of many hundreds of chemicals for which it needed the data. <p>As for TSCA Section 6, Mike’s rendition of the asbestos saga reflects what has become a fashionable storyline of late among some in the chemical industry: He essentially resorts to “blaming the victim” – in this case EPA – by claiming the agency simply didn’t do a good job. In fact, EPA spent over a decade and millions of dollars developing the Section 6 rule, in the process compiling a 45,000-page record, making it one of the most extensive and expensive rulemakings in EPA history. (For more balanced views of the history of Section 6, see, for example: Carnegie Commission on Science, Technology, and Government, Risk and the Environment: Improving Regulatory Decision Making, 1993, available online at www.carnegie.org/sub/pubs/science_tech/reg.txt; and Lisa Heinzerling, Testimony Before the Subcommittee on Environment and Hazardous Materials of the Committee on Energy and Commerce, U.S. House of Representatives, July 13, 2004, at www.law.georgetown.edu/faculty/Heinzerling/Testimony/POPs_Testimony_July_2004.pdf.)</p> <p>This “blame the victim” argument also demonstrates considerable chutzpah on Mike’s part, since of course groups like ACC and its members stand at the ready to challenge any rule EPA does manage to propose or finalize.</p> <p>Here’s what EPA is required to assess and the findings it is required to make under TSCA Section 6 to control any chemical in commerce: It must first find that the chemical “presents or will present an unreasonable risk of injury to health or the environment.” To do so, EPA must evaluate not only health and environmental effects and exposure, but also the benefits of the chemical; the availability of substitutes; and the economic and social effects of the rule it proposes, including impacts on the economy, small businesses and innovation. EPA must prepare analyses of hazard and exposure, conduct a risk assessment, develop a substitution analysis for each use it proposes to restrict, and provide a full economic (cost-benefit) analysis. Then it must demonstrate that the proposed control is the least burdensome it could have proposed. Finally, it must demonstrate that no other statute could address the concern. EPA must also develop and finalize its regulation through full notice-and-comment rulemaking.</p> <p>Is it really any wonder EPA has given up trying?</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-35	<p>Toxics In Products By Accident</p> <p>We know unwanted toxics can be present in products—we need look no further than recent attention on imported toys with lead-based paint. Short of erecting additional physical or regulatory barriers to the entry of products that may contain unwanted toxics—such as costly and burdensome testing regimes—what can California do in the context of Green Chemistry to prevent the accidental contamination of a product by a toxic?</p> <p>Unwanted toxics in a product can be the result of several factors. The unwanted toxic may exist in a raw material sourced well up the supply chain, it can arise from the manufacturing process, develop between the time of manufacture and the time of use (as in food spoilage or chemical reactions caused by light, heat, oxygen, or radiation), or it can result from an inappropriate product or raw material choice by a manufacturer or from intentional adulteration.</p> <p>The development and use of products standards and product-chain commitment to quality and purity can eliminate many of these concerns. While not every process needs the same level of quality, a material used directly in a consumer product may need to adhere to different standards than an intermediate or reactant in a process with many additional downstream process steps. California’s Green Chemistry Initiative might well identify a few key product areas, and work with the affected industry sectors to either promote existing standards (and many such standards already exist) or develop new ones.</p> <p>Moreover, it is critical that there be an understanding of what is the unwanted toxic material? The chemical identity of an impurity can be a strong leg up in eliminating it. This argues for funding and improving research in new analytical methods for detection and quantification. If an impurity can be traced back to synthesis conditions, for example, adjusting the synthesis can help prevent the generation of some unwanted material in the first place. It’s important to note, however, that virtually every synthesis requires an isolation step if the material is to be delivered as a pure product. Every chemical reaction generates some by-products, especially when analyzed at parts per billion or parts per trillion levels. To put this in perspective, one drop of water is 1 ppb of an Olympic-size swimming pool, and a part per trillion is a million times less than one part per million. It would be unrealistic to expect that end-of-pipeline purification methods could ever be eliminated, particularly as our ability to detect materials improves. Again, support for key process-related research could yield important new means to reduce the presence of unwanted toxics due to synthesis.</p> <p>Just as for toxics present in a product by design, the question of how much of a toxic is present by accident is relevant in determining what, if anything, can or should be done at the policy level. In short, dose matters, as does exposure. Receiving a dose of a chemical from a product depends not only on the identity and concentration of the chemical and the product, but on whether the toxic is chemically bound in or on the product. For example, polymers typically have such a large molecular weight, and are so tightly bound to other polymer units, that they are generally not biologically active or diffused. Inherent toxicity or other chemical properties is a necessary but insufficient measure of the risk associated with any material. It must be recognized that the product itself and its use pattern can be a determining factor as well. For example, a chemical contained in a hydraulic system versus one that is applied to the skin versus one eaten present dramatically different exposure scenarios. California might decide to focus its support for research and development on identifying particular risks, and risk reduction measures, in areas where exposure potential is particularly acute or poses special concerns (e.g., the workplace or potential exposures to children).</p> <p>By definition, an “accident” is an unintended result. And while unintended results cannot be eliminated, approaches to minimize the likelihood of their occurrence are possible without onerous regulatory constraints. California’s Green Chemistry Initiative can help define toxics of particular concern and the risk parameters associated with them to set the bar for product performance, and can further help promote diligence on the part of the manufacturers and marketers to comply with appropriate product standards.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-36	<p>Thoughts on Fostering Product Stewardship</p> <p>The Consumer Specialty Product Association's (CSPA's) members are committed to manufacturing and marketing safe products which are protective of human health and the environment while providing essential benefits to consumers. To demonstrate this belief and practice, in 2001, CSPA initiated our Product Care program.</p> <p>CSPA's Product Care program is a stewardship program for the consumer and institutional specialty products industry where participating companies have agreed to go beyond government regulations in emphasizing health, safety and environmental concerns by carefully designing products, purchasing raw material and packaging, operating safe manufacturing facilities, promoting safe storage and distribution, providing useful product information, answering consumers questions and anticipating product disposal needs. CSPA believes that these types of product stewardship programs should be considered as frameworks for programs developed under the Green Chemistry Initiative.</p> <p>Product Care provides a framework for companies to identify and commit to stewardship principles, share ideas and information and benchmark better performance. Participating companies have pledged to develop management principles for each of seven areas in a product's life cycle from development in a research facility through product use and disposal. In doing so, Product Care participants commit to the following concepts:</p> <ul style="list-style-type: none"> • We will strive to improve our efforts to protect and reach out to our employees, our customers, the community and the environment, as they are affected by our products and operations. • We will seek and value public comment regarding our products and operations. • We will provide information on safe and effective use of our products, as well as their health and environmental risks, to consumers and other affected stakeholders, encouraging them to partner with us in the appropriate use and disposal of our products. • We will, through CSPA, work with government and other stakeholders in the ongoing review and development of responsible laws, regulations and industry practices to help safeguard the home, workplace, community and environment. • We will promote our values to our contractors and other business partners. • We are committed to the sustainability of our environment and economy, and will work in partnership with governments and other stakeholders to encourage sustainability. <p>1. Product Design</p> <ul style="list-style-type: none"> • We will independently seek to design products, packaging and labeling that are appropriate for the intended uses, and seek to minimize potential harm to our employees, customers, consumers and the environment. • We will have our products evaluated for health and safety in an effort to identify the consequences of potential exposures. <p>2. Raw Material, Package and Service Supply</p> <ul style="list-style-type: none"> • We will have an internal process for our independent selection of raw material, package and service suppliers to promote our product stewardship objectives. • We, as suppliers, will share our expertise and information to assist our customers in using our materials and services safely and effectively in their operations. • We, as formulators, will make full use of the expertise and information of our suppliers to help us use their materials and services safely and effectively in our products and operations. <p>3. Manufacture and Production Site Management</p> <ul style="list-style-type: none"> • We will have systems in place to identify potential risks to our workers, the community and the environment presented by our operations, and design prevention measures to manage, reduce or eliminate those risks. • We will have emergency response programs for our facilities. <p>4. Product Storage and Distribution</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<ul style="list-style-type: none"> • We will establish and make available procedures for the handling, storage and distribution of our products to protect personnel, property and the environment. • We will have an emergency response plan to address the risks associated with our handling, storage and distribution. <p>5. In-market Support, Incident Evaluation and Follow-up</p> <ul style="list-style-type: none"> • We will support dissemination of safety related product information regarding routine use of our products that is accurate, complete and in context to the inquiry or concern. • When product-related incidents occur, we will have systems in place to minimize adverse effects, assist our consumers/customers and provide needed information. • We will strive to influence product and label design as well as develop educational messages on safe and responsible product use based on information regarding unintended events and other types of exposures involving our products. <p>6. Consumer Education and Outreach</p> <ul style="list-style-type: none"> • We will support public education programs that promote the safe and effective use of our products, and that help consumers put exposure and toxicity in proper context with hazard and risk. This can be done through programs of CSPA and the Alliance for Consumer Education (ACE). • We will provide appropriate training materials when necessary to assure the proper and safe use of our products that are intended for commercial, institutional or industrial consumers. • We will communicate appropriate environmental, health, safety and efficacy information, as well as warnings, to employees, distributors, and consumers, and ensure that labels, labeling, bulletins, material safety data sheets, and other appropriate product information, are designed to be accurate and not misleading. <p>7. Product Disposal</p> <ul style="list-style-type: none"> • We will strive to make our products and packages compatible with typical municipal solid waste or sewage handling systems, encourage recycling of our products where recycling exists, and support other forms of waste minimization. • We will support programs of Integrated Waste Management (IWM) in communities, recognizing the distinct roles of manufacturers, retailers, governments, and consumers in the cost-effective management of waste. <p>Stewardship did not begin when CSPA's Product Care program was initiated in 2001. Responsible companies have long followed policies promoting safe products that provide important health benefits while not adversely affecting the environment. CSPA believes it is vital that these types of product stewardship programs and companies that participate in these programs be recognized and fostered through any program developed under the Green Chemistry Initiative.</p>
F-TA-37	<p>Stimulating Green Chemistry</p> <p>"Green Chemistry" is an intellectual framework that aligns technology innovation with improvements in the health and environmental "footprint" of materials used in our society. It requires inter-disciplinary collaboration among a variety of experts in chemistry, toxicology, and environmental science that work in business, government, and academia. Government cannot, and should not, dictate by statute or regulation precisely how this process for innovation and collaboration should occur.</p> <p>Importantly, a "Green Chemistry" program, in and of itself, should not be picking "winning" or "losing" products. Instead, it should be removing barriers and creating objective tools to allow companies to create new products and enable consumers to recognize and choose them. According to a March 28, 2002, publication of the Organisation for Economic Co-operation and Development (OECD) (of which the United States is a member) entitled, "Need for Research and Development Programmes in Sustainable Chemistry" (available at http://www.oecd.org/dataoecd/9/55/2079870.pdf), "For government, sustainable chemistry is a non-regulatory way of making regulations work more effectively." OECD at 15.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>Member companies of the American Chemistry Council (ACC) are leaders in Green Chemistry and Green Engineering in their operations and have been honored for their efforts (e.g., see http://www.epa.gov/greenchemistry/pubs/pgcc/past.html for a list of EPA Presidential Green Chemistry Challenge winners). Our members view both the American Chemical Society's (ACS) Green Chemistry Principles and the ACS Green Engineering Principles as useful approaches to resource efficiency, pollution prevention, and safety. These principles, however, were never intended to be applied as government mandates. In fact, prominently displayed on the home page of the Green Chemistry Institute is the statement: Green Chemistry differs from previous approaches to many environmental issues. Rather than using regulatory restrictions, it unleashes the creativity and innovation of our scientists and engineers in designing and discovering the next generation of chemicals and materials so that they provide increased performance and increased value while meeting all goals to protect and enhance human health and the environment. So, how can California encourage Green Chemistry rather than attempt to mandate it? Several actions may be taken to stimulate Green Chemistry in California and the United States broadly. For example, government can and should provide encouragement for Green Chemistry collaborations through the sharing of expertise, financial support for research, information exchange, and public education. In fact, a variety of federal agencies (including EPA and DOE), companies, professional associations such as ACS, Non-Governmental Organizations (NGO), and universities are already working together to encourage Green Chemistry strategies. Additionally, government should consider offering incentives for companies to pursue and foster Green Chemistry and Green Engineering to help ensure these products/technologies can become economically viable and gain initial access to a competitive marketplace. These incentives might include tax incentives, low interest loans, awards, and marketing exposure.</p> <p>I. Education and Research/Development Industry is always working to drive down production costs. For specialties and fine chemicals, the synthetic chemists working in developing these materials have to know how to ask the Green Chemistry questions. This stands squarely in the realm of science education, especially in schools of chemistry. Not only do chemists and others involved in chemistry need to understand toxicology, but they also need to better understand the interaction between health and environmental protection, toxicology, and price. It is therefore essential that California support education in the methods and principles of Green Chemistry for all its state colleges and universities (and in its high schools and vocational schools, as appropriate). Anywhere that chemistry is taught, toxicology and Green Chemistry should also be taught. Additionally, California should encourage innovative research in Green Chemistry and Green Engineering. Research funding into new Green Chemistry methods is always welcomed by colleges, universities, and others, and should be an important part of any Green Chemistry program. According to the OECD (again referring to their March 2002 publication): Governments can promote sustainable chemistry R&D...by establish[ing] and fund[ing] programmes on sustainable chemistry R&D. ... In addition, parts of industrial programmes are often supported by government funds. Governments, in general, can provide funds for basic and pre-competitive research. ...Practically, governments can orient sustainable chemistry R&D programmes by adjusting the distribution of funds for fundamental and applied research or by commanding competitive and targeted funds depending on policies. OECD at 15.</p> <p>II. Incentives To further stimulate Green Chemistry and Green Engineering, California should consider the following incentives: (1) awards like EPA's Green Chemistry Challenge (see http://www.epa.gov/greenchemistry/pubs/pgcc/presgcc.html for more information); (2) tax incentives/subsidies/grants/low interest loans for research and development; and (3) marketing exposure for Green Chemistry processes and products. For example, when California purchases chemicals for state contracts, it could decide to pay a modest premium for a set period of time for new "green materials" that show promise. The goal of this subsidy would be to help a new material achieve greater economies of scale, but avoid locking in an</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>inefficient permanent subsidy. California could additionally make capital available to companies at preferential terms, whether via grant or lower interest loans, to encourage Green Chemistry and Green Engineering manufacturing process development. And California could also consider a marketing program (perhaps akin to the "California cows" and dairy ads currently on television) whereby the state would promote companies that are actively engaged in Green Chemistry and Green Engineering, and products that are the result of Green Chemistry and Green Engineering.</p> <p>The OECD suggests: [G]overnments can facilitate the consideration and application of sustainable chemistry R&D by supporting efforts which aim at educating and informing industry and the general public of the importance and benefits of sustainable chemistry. One possible role for government would be to identify incentives and disincentives for the promotion of sustainable chemistry and to use this information to modify or develop their policies accordingly. When appropriate, the use of incentives, such as a reduction in taxes or the use of subsidies, can be an effective way of supporting R&D by academia and industry in the field of sustainable chemistry. ... It is essential that any sustainable chemistry technology or product be competitive in the marketplace, at least in the long term. However, some of those technologies, even if they are beneficial in the long term, will not be able to survive economically without incentives. Economic incentives, such as subsidies or tax reductions, could be effective in these cases. OECD at 15 and 17.</p>
F-TA-38	<p>A Modern Chemicals Policy For California CALIFORNIA MEDICAL ASSOCIATION A MODERN CHEMICALS POLICY FOR CALIFORNIA (2007) Introduced by: San Francisco Delegation</p> <p>Whereas, the state, national, and global scale of industrial chemical production is immense and is expected to grow four-fold by 2050, and the chemical industry is an important industry with wide contributions to health and human development; and Whereas, ever-expanding research confirms that many chemicals that are useful to society are also known to be hazardous to human biology and health, particularly in utero and in developing children; and Whereas, for new and existing medications, the Food and Drug Administration has long required pre-approval evaluation of safety as well as efficacy, and many industrial chemicals with known impacts on human biology are present in human bodies at levels similar to active doses of medications; and Whereas, numerous other nations including Canada and the European Union are adopting more proactive health-oriented chemicals policies, based upon scientific knowledge, assessment, and accepted public health principles; and Whereas, there are long-standing deficiencies in the federal regulation of industrial chemicals, most notably in the Toxic Substances Control Act (TSCA), as confirmed by the National Academy of Sciences and others, and the University of California documented in a 2006 report to the California Legislature that TSCA's deficiencies are important and can be remedied; and Whereas, these problems include the projected appearance of 600 new hazardous waste sites each month in the U.S. over the next 25 years; the appearance of hundreds of industrial chemicals in human tissues and fluids, including those of infants; and the development of chronic diseases caused by chemical exposures on the job among 23,000 California workers each year; and Whereas, the American Public Health Association's leadership has recently endorsed a policy titled "Calling on the U.S. Congress to restructure the Toxic Substances Control Act and implement a modern, comprehensive chemicals policy", to be considered for adoption at the annual APHA meeting in November; Therefore, be it Resolved: That the CMA calls upon the State of California and United States to implement a modern, comprehensive chemicals policy in line</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>with current scientific knowledge on human health, and which requires a full evaluation of the health impacts of both newly developed and existing industrial chemicals now in use; And be it further RESOLVED: That this matter be referred for national action (AMA). REFERENCES: http://www.healthandenvironment.org/science/papers on behalf of the California Medical Association</p>
F-TA-39	<p>How did it get there? When so-called toxics are found in products, a number of things are important to consider:</p> <ol style="list-style-type: none"> 1. Will the material be reasonably expected to cause harm at the levels present in the article or extractable from the article? The inherent toxicity is only one measure of the potential to have impact, as exposure via "intended and non intended use" matters as well. 2. If the material is generally present but is not an intended constituent it is important to understand how the material got there and who is responsible for reducing its presence or impact. <ol style="list-style-type: none"> a. If that presence results from any part of the manufacturing process, the manufacturer at that step should exercise product stewardship to alter the production methods or materials to reduce the impact. b. The material could be an impurity carried through from an earlier step in the process that could be eliminated by the actions of a supplier to the manufacturer. c. The material could be present as a result of degradation over time, or as a direct result of use of the article. 3. There are other means by which an unintended product could appear in a final product—among them chemical or biological reactions for example, due to light or heat or intentional adulteration. The latter is a rare occurrence and not systematic; it requires legal intervention. The former may be systematic and could require different packaging or storage conditions, or even addition of other chemicals. <p>Each analysis requires an understanding of the product, the process and the supply chain. These are all essential elements of product stewardship, a core value for responsible producers, and users of products.</p>
F-TA-40	<p>Check out This Tool that Will Work!!! Last week I attended the Western Regional Pollution Prevention conference in San Diego and had a chance to see a demo of a software tool that would be incredibly effective in addressing some of the concerns here. In fact I understate my excitement because it is so eye-popping to see to see the software in action, I can only hope to do it justice here. The software is very sophisticated but unlike other solutions I've seen, this one is actually very user friendly. It is the first real tool I've seen that can be used by industry experts, academia and the general public. Wow, let me say that again...the general public can actually use this tool it is that user friendly. The implications for Compliance Managers, Risk Assessment Departments and Purchasing agents are enormous. In addition to these individuals who must regularly make decisions that affect their organization, colleagues, and communities, there are also many in the medical profession, biotech, agriculture, ecologists and yes even economists (!) can plug in use this tool to get the results they need. Those of us posting here can dig into the inner workings of the software, because behind the easy-to-use interface is a complex, meticulous database that has been so well tested and refined that it is virtually bulletproof with respect to passing peer-based reviews. Dr. George Thompson has spent 25 years creating a chemical database of 75 million data elements for more than 210,000 chemicals, 350,000 products compiled from over 1,000 sources. His software can generate a score that can accurately and effectively measure the toxicity levels in a given chemical recipe, process, or product and give specific information about the impact on Health, Safety and Ecology. Not only that, it is possible to cross reference information regarding the chemicals, CAS numbers, regulatory lists, (very exciting!) and can eliminate redundant data so that it's easier for departments to work together and get things done faster.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>There is much more detail that I can go into, however what's more important is that you, as you're reading this, get curious enough to check out Dr. Thompson's tool. It is worth the time to take a look, and even more than that, I would be thrilled to see the technology implemented as part of California's comprehensive solution. For this reason, I'm getting the word out on the other forums too.</p> <p>We need to be looking at this solution. There is no more time to wait.</p> <p>We must involve people at the business and community level.</p> <p>We must give people at the business and community level a tool that will work for them.</p> <p>Not just us.</p> <p>Check out www.chemply.com</p> <p>Read more about this man's work. It is phenomenal!!!!!!</p>
F-TA-41	<p>Thoughts About Substitution</p> <p>Contributions from chemistry bring many benefits to society, but there are chemicals which can pose risks to health or the environment in certain circumstances. Some argue that the most sensible approach to these chemicals is to replace them with substances considered less hazardous—a seemingly simple concept, but substitution is not always feasible and not always the right choice. American Chemistry Council (ACC) members, through Responsible Care®, regularly consider substitution as an option in their broader green engineering and process design efforts. When doing so, companies must closely examine the implications for the safety, functional performance, and cost of alternatives to avoid ineffective changes with unintended negative health and environmental impacts.</p> <p>A good cook knows that you cannot arbitrarily change ingredients in a recipe. Whole wheat, rye, all purpose, and pastry are just a few of the many different varieties of baking flour. Yet, bakers know that while all flour is similar, many cannot be substituted without creating a result nobody would want to eat. The same holds true for chemical processing. You cannot simply replace one chemical ingredient for another without impacting the final product. Therefore, significant problems would result if chemical substitution were mandated as the solution of first choice without careful consideration of potential consequences. This is very much the approach taken by an international group of experts to the Intergovernmental Forum on Chemical Safety (IFCS) earlier this year in talking about “informed substitution”. (see the background elements of the IFCS paper available at http://www.who.int/ifcs/documents/forums/forum6/12_original_prop.doc)</p> <p>SUBSTITUTIONS MAY CHANGE THE NATURE OF THE PROBLEM RATHER THAN SOLVE IT</p> <p>Mandatory bans and forced substitutions often are not a complete solution because, as one issue is addressed, another set of concerns may arise. This is the difference between “informed substitution” and “regrettable substitution”, with the goal of “informed substitution” being to avoid “regrettable substitution”. For example, the health and convenience of our lives has been greatly enhanced by modern refrigeration. Refrigerators originally used ammonia, a toxic chemical, as a coolant. As scientific discoveries were made, chlorofluorocarbons (CFCs) replaced ammonia. While CFCs are practically non-toxic, they were later implicated in depleting the ozone layer and eventually banned. CFCs were then replaced with hydrochlorofluorocarbons (HFCs), which have no impact on the ozone layer, are non-flammable, have low toxicity, and high energy efficiencies. Scientists have now learned that HFCs could contribute to global warming if released into the air. Alternative coolants such as hydrocarbons and carbon dioxide have been considered, but both need to be carefully examined because of the potential for emissions and the possible dangers from higher operating pressures.</p> <p>In another example, consider the Peruvian government's decision to stop chlorinating drinking water. The result in 1991 was a five-year epidemic of cholera which spread to nineteen Latin American countries, causing more than one million illnesses and 12,000 deaths. After the outbreak, U.S. and international health officials criticized Peruvian water officials for not chlorinating the entire water supply. An official with the Pan American Health Organization (PAHO) blames the inadequate chlorination, at least in part, on concern over disinfection byproducts. In a 1997 article in the Journal of the</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>American Water Works Association, Horst Otterstetter states, "Rather than being abated by increased use of chlorination, the waterborne transmission of cholera was actually aided because of worries about chlorination byproducts." Substituting one material for another is never as simple or straightforward as it might at first appear.</p> <p>SUBSTITUTIONS MAY RESULT IN UNINTENDED ADVERSE CONSEQUENCES Trading in a fuel-hungry SUV for a moped may address energy efficiency concerns, but it's probably not a reasonable option for a mother of four. Like the moped, forced substitution, without full consideration of the potential impacts, is impractical and unwise. For example, some substitute chemicals require higher processing temperatures and greater pressure conditions in order to achieve the same result as the original chemical. Additionally, if the substitute chemical is not compatible with the processing equipment, it can cause break downs or failures. In some circumstances, the substitute is not as effective as the original chemical and more quantity must be used which results in larger amounts of waste materials and increased waste disposal management and risks. All of these factors can lead to increased safety concerns for the worker population, as well as increased energy consumption by the company. This unintended consequence of substitution was clearly demonstrated in Europe when energy companies decided that fuel derived from plants would be more environmentally friendly than fossil fuels. Those companies developed specialized generators for palm oil, which increased demand. To keep up with that demand, palm plantations cleared large tracts of land by draining and burning peat land, resulting in huge carbon emissions into the atmosphere. The production of the plant derived fuel had an unintended consequence of creating more harmful emissions than the fossil fuels they were intended to replace.</p> <p>SUBSTITUTION IS NOT THE ONLY VIABLE APPROACH TO CONTROL RISK The principle of risk reduction is and always has been part of the normal day-to-day operations for the business of chemistry. Industry's ability to innovate allows us to respond to society's evolving needs for better, safer products. Beyond substitution, the chemistry industry considers many other options to minimize potential hazards, such as operational management systems, engineering controls, modifications to the chemical product, and waste management innovations. The industry also provides specialized consumer training and works with communities to implement effective recycle/reuse programs. Through ACC's Responsible Care® initiative, ACC member companies go above and beyond government rules and regulations to continuously improve their environmental, health, safety, and security (EHS&S) performance. ACC members employ a rigorous EHS&S management system that is certified by third-party auditors. Among numerous other elements, auditors verify that our companies have systems to manage risk associated with chemical products including management of product development, transport, use, and disposal in a safe and secure manner. Companies are also audited on their programs to protect the environment and to conserve resources, as well as their efforts to dialogue with community stakeholders about the organization's impact on human health and the environment. Company performance under Responsible Care® is publicly shared through americanchemistry/responsiblecare.com. For more information on Responsible Care®, please visit http://www.responsiblecaretoolkit.com.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-42	<p>CHANGE's Perspective on a Successful Program We write to you today on behalf of CHANGE, Californians for a Healthy and Green Economy. Ours is a broad-based growing coalition of approximately 35 environmental and environmental justice groups, health organizations, labor advocates, community based groups, parent organizations, and others who are concerned with the impacts of toxic chemicals on human health and the environment, as well as the lack of a regulatory framework that seeks to prevent exposures to toxic chemicals. We thank you for your leadership initiating the Green Chemistry Initiative and would like to take this opportunity to join the Conversation with California by offering our perspective on what would make the program successful in addressing the critical human and environmental issues related to chemical use.</p> <p>on behalf of CHANGE</p>
F-TA-43	<p>Dow Chemical's Green Chemistry Thoughts The Dow Chemical Company (Dow) is pleased to provide the following comments on California's Green Chemistry Initiative (GCI). On June 29, 2007 Dow provided initial comments that represented our principles for sustainable chemistry at a corporate level. That letter spoke of Dow's accomplishments in sustainability, Dow's aggressive 2015 Sustainability Goals, and Dow's suggestions for framing California's GCI. We have engaged fully in the DTSC's process; Dow people have spoken at two of the three Green Chemistry Symposia and have participated in the workshops, including serving as break-out session facilitators. This current submission offers Dow's more-detailed thoughts in the specific areas of: § Life-Cycle Assessment § Eco-Labels § Consumer Choice § Environmentally-Preferred Purchasing § Incentives</p> <p>on behalf of the Dow Chemical Company</p>
F-TA-44	<p>Have EPA programs really closed the data gap? These comments respond to the American Chemistry Council's comments titled "Addressing the Data Gaps" posted on October 15, in particular those characterizing the types and amounts of information reported to EPA under: (1) the TSCA Inventory Update Rule (2) the US HPV Challenge Program and the industry's Extended HPV Program.</p> <p>(1) Information submitted to EPA under the TSCA Inventory Update Rule For certain chemicals in commerce, limited and infrequent reporting of production, use and exposure information by manufacturers has just been initiated under EPA's Inventory Update Rule (IUR). Such reporting is required only of chemical manufacturers (and in some cases, processors), but not of companies that use chemicals, whether directly or as ingredients in products. Beginning in 2006, manufacturers of non-exempt chemicals produced or imported in amounts of 25,000 pounds or more per year per site are required to report to EPA the information noted by ACC – to the extent it is "known or reasonably ascertainable." For chemicals manufactured in amounts of 300,000 pounds or more per year per site, the additional information on downstream processing and use noted by ACC must be reported – but only to the extent that it is "readily obtainable." Fewer than 10,000 chemicals are covered by the basic production information reporting requirements, and only a few thousand of these will be subject</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>to the more extensive reporting that extends to downstream processing and use information. Reporting is required only once every five years and then only for a single reporting year. Much of the information reported to EPA is designated confidential business information (CBI). Under TSCA, EPA is prohibited from divulging any CBI to the public or to other governments, including the State of California.</p> <p>(2) Information developed under the US HPV Challenge Program and the industry's Extended HPV Program. For more detail and documentation of my comments below, see my recent report, High Hopes, Low Marks: A Final Report Card on the High Production Volume Chemical Challenge, available online at www.environmentaldefense.org/hpvreportcard. The Challenge represents the only systematic effort by the US Environmental Protection Agency (EPA) to foster the development of and public access to basic hazard data on a relatively large number of chemicals in commerce. It should be acknowledged that the program is developing and making public basic hazard information for more chemicals in less time than any prior effort, and it represents the first significant step taken in the US toward closing the gap between what we know and what we should know about widely used chemicals. But the limitations of this voluntary program and the information it is providing need to be understood as well. Because the Challenge is voluntary, it side-steps the onerous findings EPA must make to exercise its authority under Section 4 of TSCA to compel hazard testing of chemicals. However, for the same reason, EPA also has limited recourse to ensure full participation by manufacturers or the timely submission and high quality of hazard data sets developed for HPV chemicals. The following statistics on the status of the HPV Challenge, which began in 1998, are current as of July 2007.</p> <p>MORE THAN 18 MONTHS AFTER THE ORIGINAL DEADLINE, THE HPV CHALLENGE IS FAR FROM COMPLETE</p> <ul style="list-style-type: none"> • Two-and-a-half years after final data sets were due, fewer than half (47%) have been submitted. • 10% of eligible HPV chemicals were not volunteered for the Challenge by the companies that produce them; EPA has issued rules to compel testing for only 6% of these chemicals. <p>THE QUALITY AND COMPLETENESS OF FINAL DATA SETS HAVE YET TO BE DETERMINED</p> <ul style="list-style-type: none"> • The average quality of sponsors' initial submissions, while originally quite good, has declined over the course of the Challenge, especially in the past 18 months. The grade point average for initial industry submissions has declined from a solid B-plus in 2001 to a C-minus in 2006. • Of the final submissions examined so far by EPA, covering about 100 HPV chemicals, EPA has found that data gaps remain in about a third of them. <p>THE HAZARD DATA SUBMITTED ARE SCREENING-LEVEL DATA ONLY</p> <ul style="list-style-type: none"> • Hazard data being collected under the Challenge are limited to a subset of the Screening Information Data Set (SIDS), developed under the auspices of the OECD. • The SIDS data are generally acknowledged to be insufficient to provide the basis for a full hazard assessment, let alone a risk assessment, for a chemical. It relies primarily on testing of acute or subchronic toxicity, for example, and its ecological endpoints only include toxicity to aquatic organisms. <p>THE PROGRAM FOCUS IS LIMITED TO HAZARD DATA</p> <ul style="list-style-type: none"> • By design, the Challenge did not call for submission of use and exposure information, although some sponsors did submit some such information. • As a result, the program will provide little if any reliable, comprehensive information about the use of and exposure to HPV chemicals. <p>EPA HAS LITTLE RECOURSE IF DATA QUALITY IS POOR OR DATA ARE INCOMPLETE</p> <ul style="list-style-type: none"> • Because the HPV Challenge is voluntary, EPA has very limited ability to ensure that the data submitted by sponsors are of high quality and complete. While EPA and other commenters have often identified deficiencies in initial submissions, there is no legal or binding obligation on the part of sponsors to heed those comments. • EPA has agreed to conduct a quality and completeness review on final submissions, and to make known the results, but cannot compel sponsors to

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>address any problems that are identified.</p> <p>THE REGULATORY "BACKSTOP" FOR THE PROGRAM IS WEAK</p> <ul style="list-style-type: none"> • EPA's authority under TSCA to compel testing of the 10% of HPV Challenge chemicals that were not voluntarily sponsored is seriously constrained; to date, EPA has issued test rules for only 16 (6%) of the 265 unsponsored "orphan" HPV chemicals. <p>THE MAJORITY OF CHEMICALS IN COMMERCE ARE NOT HPVS</p> <ul style="list-style-type: none"> • While, as ACC notes, HPV chemicals constitute the bulk of chemicals in commerce when measured by tonnage, non-HPV chemicals far outnumber HPV chemicals. • The TSCA Inventory contains more than 82,000 chemicals that have been in commerce at some point since 1979. Based on the 2002 TSCA Inventory update reporting, EPA reported some 5,400 so-called medium production volume (MPV) organic chemicals manufactured in 2002 in amounts above 10,000 pounds per year; an unknown number of chemicals below that threshold are in commerce in the US, because they are not required to be reported. • The European Union (EU) estimates that about 30,000 chemicals are produced there in quantities at or above one metric ton (2,200 pounds) per year, fewer than 3,000 of which are HPV chemicals. <p>THE EXTENT OF SPONSORSHIP OF NEWLY EMERGED HPV CHEMICALS IS POOR</p> <ul style="list-style-type: none"> • Of nearly 600 newly emerged HPV chemicals – those that have reached HPV levels of manufacture since the Challenge was launched – eligible for sponsorship, only 40% have been sponsored through the chemical industry's Extended HPV Program. • EPA has found wide gaps in publicly available hazard data for these chemicals. • No test plans for these chemicals have yet been made available, and industry has not provided any tracking system to monitor the status of these commitments. • No final data sets have been submitted, despite a claim when the program was launched that data would be submitted starting in 2006. • These findings indicate that the chemical industry is not making the development of, and public access, to hazard data on all HPV chemicals "evergreen" practices.
F-TA-45	<p>Some ideas for what California can do to start advancing chemicals policy</p> <p>Here are some ideas for what California can do to start to advance chemicals policy and promote green chemistry. They are derived from ideas I have presented at several GCI forums, but I wanted to add them into the mix being collected via the Conversation.</p> <p>What can California do?</p> <ul style="list-style-type: none"> • Ensure access to information gathered by others <ul style="list-style-type: none"> – Negotiate for access to confidential business information (CBI) submitted under the European Union's REACH Regulation and under the Canadian Environmental Protection Act (CEPA) – Require companies making/importing chemicals in California that are subject to REACH or CEPA to submit the same information to California officials – Enhance existing IT infrastructure to receive and share the large volumes of REACH data • Set clear criteria to identify chemicals of concern <ul style="list-style-type: none"> – Can be hazard-based (e.g., PBTs) and exposure-based (e.g., chemicals detected through biomonitoring) – Use these criteria to drive further assessment and control of chemicals meeting the criteria – Require adherence to clear timelines for conducting assessments and making control decisions • Map the flow of chemicals in California by developing and sharing production/use info <ul style="list-style-type: none"> – Require California producers/importers and users to submit and update information on production and processing (amounts, facility locations), uses (including in products), and post-use management

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<ul style="list-style-type: none"> – Require updating of MSDSs to reflect all available data (US HPV Challenge, REACH, Canada) – Require disclosure of chemicals in consumer products • Could focus initially on priority chemicals (Canada priority list, REACH Substances of Very High Concern (SVHC) list) • Advance the science – HPV, REACH data sets use 20+ yrs. old tests (“old toxicology”) – Fail to account for: <ul style="list-style-type: none"> > Emerging issues, e.g., endocrine disruption, development neurotoxicity > Emerging science, e.g., low-dose effects, timing of exposure during development > Emerging methods, e.g., toxicogenomics, high-throughput screening and mechanistic assays > Perpetual concerns: e.g., cumulative, aggregate exposures, susceptible subpopulations – California is well-positioned to help move toxicology into the 21st century – Can help to develop, road-test and share new methods, testing strategies – Utilize biomonitoring data and methods to advance dose and exposure measurement – Press industry, federal government to move forward – Collaborate with universities <p>Why do this?</p> <ul style="list-style-type: none"> • Casts a broad net – to identify not only “bad actors” but also chemicals of low concern • Influences and informs chemical and product design decisions • Identifies and fills gaps – information (data and safety) and technology gaps • Empowers a range of actors – government, industry, academics, public – to advance knowledge and make better decisions about chemicals
F-TA-46	<p>Limitations to Risk-Driven Approaches to Chemical Prioritization [NOTE: This post is based on a paper I published in the OECD Series On Testing And Assessment, No. 51, Approaches to Exposure Assessment in OECD Member Countries: Report from the Policy Dialogue on Exposure Assessment in June 2005, Chemicals Committee, Organization for Economic Cooperation and Development, p. 109, available at http://appli1.oecd.org/olis/2006doc.nsf/linkto/ENV-JM-MONO(2006)5. It is provided in part to respond to the American Chemistry Council's comments arguing for sole reliance on risk-based evaluation for chemicals.]</p> <p>While both hazard and exposure are clearly relevant in determining chemical risks, there are critical differences between our ability to assess hazard and exposure that have implications for the development and application of risk and exposure assessment policies. And real-world experience in chemical assessment programs that have attempted to rely on exposure information to prioritize chemicals also offers lessons for exposure assessment. In this paper I first address these issues, and then discuss their implications for risk and exposure assessment policies.</p> <p>Critical differences between assessing hazard and exposure</p> <p>Approaches to integrating exposure assessment into regulatory decision-making need to acknowledge and account for a number of critical differences between the nature of hazard and exposure information and their relative extent of availability. While both hazard and exposure are clearly relevant in determining risk, certain characteristics of exposure information pose serious challenges to sound decision-making:</p> <ol style="list-style-type: none"> 1. Hazard is largely inherent to a chemical, and doesn't fundamentally change over space or time, whereas any exposure information necessarily represents only a “snapshot” in both space and time. <p>A chemical's hazard is relatively intrinsic, largely or entirely independent of how the chemical is used, where or how it enters the environment, or other factors that vary with time and place. Hazard data are therefore relevant (i.e., necessary though not sufficient) in characterizing risk whatever the use of</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>a chemical, and hence are useful in understanding any and all potential uses of or exposures to a chemical -- and what kind of exposure-reducing efforts may need to be taken.</p> <p>Just the opposite is true for exposure, the potential for which changes depending on how a chemical is produced, used, transported and discarded. Conditions that determine exposure can and often do differ enormously for every setting and point in time that a chemical is present. And even if a "snapshot" of current exposure were able to be assembled, the next new use or activity leading to a release would alter the exposure picture. The variable nature of exposure poses a major challenge to exposure (and risk) assessment: It means that exposure assessment must be an ongoing activity, with the scope and frequency of its measurement sufficient to characterize the variation in as well as magnitude of exposure.</p> <p>2. Voluntary and regulatory mechanisms for generating and collecting exposure information are undeveloped relative to those for hazard information. Extensive international consensus exists as to how to test a chemical for most hazardous properties. Detailed government-sanctioned procedures, guidelines, criteria and standards are already in place for conducting hazard tests, for assuring the quality and reliability of the results, and for determining whether the results constitute evidence of a particular hazard. Moreover, these measures allow that results are reproducible and can be independently verified.</p> <p>In contrast, virtually none of these mechanisms are in place to assure that exposure information is complete and accurate. Debates over what constitutes adequate exposure assessment and how to address the "moving target" nature of such information are far from resolved. Government-sanctioned procedures for generating, evaluating the adequacy of and interpreting exposure data have yet to be developed or validated, including testing and measurement standards, guidance, methods and tools.</p> <p>Even use and exposure information reported in sufficiently qualitative terms or sufficiently aggregated form so as to eliminate any confidential business information (CBI, see next bullet) concern is rarely systematically collected and made public. For the first time, beginning in 2006, USEPA has begun to require the reporting of basic information relevant to understanding uses of and exposure to chemicals, although it will be limited to several thousand chemicals, and will be collected only once every five years – despite enormous documented variability in these chemicals' production volumes that presumably reflects changes in their underlying use patterns.</p> <p>3. Differential access to both exposure data and the means to generate them severely limit the "reproducibility" of such data. In addition to the variability and absence of agreed-upon procedures noted above, other factors limit "reproducibility," that is, the ability to readily and independently measure or verify exposure data. Most exposure data and the means to generate them reside virtually exclusively with industry. It must be acknowledged that industry has a strong interest in maintaining that exposure to its products is low, so the ability to independently measure and verify exposure data is critical. Yet physical access to many exposure "settings" (e.g., workplaces) is very limited and infrequent at best, even for government officials.</p> <p>Broader access to exposure-relevant information is even more restricted: Wide latitude is typically provided to claim chemical use and exposure information as CBI, preventing even its review outside government; this situation is often in contrast to that applying to hazard data, which is more likely to be deemed ineligible from designation as CBI.</p> <p>Finally, even chemical manufacturers have incomplete access to and information on their customers and how their chemicals are used. Intermediaries (vendors, brokers, distributors) are a formidable information flow bottleneck, as is the often-proprietary nature of information concerning downstream use and competition among suppliers. These factors serve to impede information-sharing even within supply chains, which in turn affects the extent and accuracy of exposure-relevant information that any one entity in a supply chain can provide if asked or required to do so.</p> <p>For all of these reasons, we believe that risk and exposure assessment at this time are simply too uncertain and unreliable to serve as a basis for deciding for which chemicals hazard data should be developed. While ultimate decisions concerning risk identification and management need to account for exposure as well as hazard, in all but the most exceptional cases, chemical prioritization approaches should be hazard-, not risk-driven.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>Difficulty of using exposure information in chemical priority-setting: OECD experience as a real-world example</p> <p>The ongoing work of the OECD Existing Chemicals Program vividly illustrates the limitations to available exposure information – and to efforts to prioritize chemicals based on such information. In that program, chemical-by-chemical assessments of high-production volume (HPV) chemicals are conducted. Typically, industry collects existing information and conducts any testing needed to fill gaps in the required set of hazard information. Industry then prepares draft assessment documents, which are reviewed by health and environmental agency officials in member countries. While the primary emphasis is on hazard assessment, program procedures currently allow for exposure information to be included to “place the hazard information into context.” As we have documented in detail elsewhere, in practice this exposure information is routinely being used to decide that chemicals that have been identified as possessing clearly hazardous properties are nevertheless low priorities for further work based on “anticipated low exposure.” Unfortunately, the exposure information typically being relied upon has truly massive deficiencies with respect to scope, quality and completeness. Such information typically is:</p> <ul style="list-style-type: none"> • very limited in scope, and hence incomplete or even haphazard in its coverage of potential exposures, because it: <ul style="list-style-type: none"> - covers only a portion of known production and use; - covers only a subset of relevant activities, e.g., production, transport, storage, processing, use by customers, use in consumer products, product disposal, waste management; - covers only a subset of exposed entities, e.g., workers, consumers, the general population, sensitive populations, and wildlife; - addresses only a subset of relevant routes of exposure, e.g., by inhalation, ingestion or dermal contact; through food, water, air; - rarely is based on ongoing or sufficiently frequent measurement to address variation or changing conditions; • unverified, unpublished, rarely peer-reviewed and of uncertain or undetermined quality; • frequently based on judgment or speculation, rather than on actual measurements, monitoring or validated methods of exposure modeling. <p>Some of these deficiencies are related to the limited requirements under the program governing what exposure information is to be provided. However, others reflect the fundamental characteristics of exposure information described in the first section of this paper, as well as limitations on the extent and quality of information actually available and the capacity for effective review, and the lack of agreed-upon measures of scope, quality and completeness. The OECD Existing Chemicals Program has wrestled repeatedly with this problem over its history. Indeed, because of what many saw as an over-reliance on exposure-related considerations in the absence of an agreed-upon approach, the program went through a major refocusing to return to a primary focus on hazard characteristics as the primary driver for the program. However, despite the refocusing effort, inconsistent and insufficient exposure-related information – more than any other factor – drives the recommendation process for chemicals being assessed through the program.</p> <p>Implications for risk and exposure assessment policy</p> <p>All of the factors discussed above mean that assembling a complete and reliable exposure picture even for a single point in time faces obstacles and has proven exceedingly difficult in practice. So how should risk and exposure assessment policies – and practices – address these current realities?</p> <p>Guidelines development: We continue to strongly support the development of comprehensive guidelines for collection, analysis, validation and presentation of exposure information, as the much-needed foundation of any exposure assessment policy and practice. In our view, the OECD program needs to invest at least the same effort in developing a process for exposure assessment as was invested in developing the hazard screening program. There remain a number of substantial obstacles that must be solved in order to ensure that adequately robust data on exposure can be gathered. Resolving these challenges will not be easy. These obstacles include:</p> <ul style="list-style-type: none"> • lack of agreement as to what exposure information is relevant and needed; • lack of consensus as to the framework and methodologies needed to conduct an exposure assessment; • limited availability of and access to internationally accepted, comprehensive measured exposure information or models for predicting exposure; and • limited information available on all uses and other exposure pathways of chemicals.

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>Guidelines need to ensure that the measured and modeled or estimated data address and are representative of the full range of actual and potential exposures that can or do occur. Procedures are needed to govern, for example, the minimum number of samples, the frequency of sampling, and other parameters so as to ensure that the results of any exposure measurements are both statistically meaningful and representative of the spatial and temporal variations present in the sampled environment. Quality assurance/quality control procedures to ensure data quality are needed. Where data are available for only a subset of production sites/release points/exposure sources, procedures are needed to determine whether and if so how extrapolations from available data can be used to characterize exposures arising from the missing sources.</p> <p>Adequate expert review: Policies need to provide for thorough review of exposure information. This starts with ensuring exposure-related expertise among reviewers is sufficiently diverse to address each of the various relevant exposure settings (workplace, consumer, environmental), and data generated through direct measurement as well as modeling. The review process should yield an explicit assessment of the scope, completeness and quality of the exposure information, in which any conclusions are qualified to accurately reflect the actual extent and nature of exposure information provided and hence the degree of associated uncertainty. Specific factors to be assessed should include:</p> <ul style="list-style-type: none"> • Scope and Completeness: geographic, temporal extent of applicability and associated limitations; to what fraction of total production and use, to what uses, and to which specific facilities, processes, activities and products the provided information applies; which activities associated with the chemical's full lifecycle (production, processing, storage, transport, use and disposal) are covered; whether information on releases and exposures relate to workers, consumers, public or the environment; whether information is based on measurements, modeling, judgment, extrapolation. • Quality: extent of documentation provided/cited; reference to/description of procedures used; representativeness of sampling underlying any measured data; validation of any model used; peer review and extent of access to underlying data; assignment of measures of reliability; reproducibility. <p>Accounting for the variable nature of exposure: Policies need to acknowledge and account for the inherent variability in exposure over time as well as space. For example:</p> <ul style="list-style-type: none"> • For new chemicals, the nature or extent of production, use and exposure needs to be tracked and revisited/reassessed over time, not only as a chemical enters commerce but as its production level and range of uses change. During the initial review/approval process, conditions should be included that require reporting of any changes in the nature and extent of production and use and other exposure-relevant factors, and such reports should trigger a reassessment of exposure potential. • For existing chemicals, policies should also be responsive to changes in the production level or use profile of a chemical. One recent illustration of this need in the U.S. is the change that has accompanied the phase-out of pentabromodiphenyl ether and its replacement with a different chemical, the production and use of which has increased dramatically as a result. <p>Data verification and model validation: To the extent data from industry are relied on, policies need to incorporate mechanisms to ensure and demonstrate that such data are accurate and representative, and wherever possible, to be able to independently verify such data.</p> <p>To the extent that modeled as opposed to measured data are relied on to provide exposure estimates, policies need to outline procedures to be employed to validate the models, provide public access to the models and their underlying data sets. Just as for measured data, policies also need to ensure that models effectively account for variation in exposure over time.</p> <p>Differential access: The differential access to exposure-related information (as discussed above) is a serious barrier to public confidence in both industry- and government-derived exposure assessment. In addition to adopting and abiding by comprehensive guidelines covering all aspects of exposure assessment, government needs to develop and implement mechanisms to demonstrate that it can independently verify the reliability of industry-generated exposure information; and industry needs to be encouraged or required to implement its own measures to increase confidence in the information it provides, including routine third-party review and a commitment to make information public whether exculpatory or not.</p> <p>In addition, policies need to consider means to break through the supply-chain bottlenecks that effectively prevent development of a full understanding of chemical processing and use. In our view, one of the key innovations offered by the European Union's REACH regulation is its intent to compel</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>information-sharing up and down the chemical supply chain.</p> <p>Finally, in our view, serious reconsideration of the currently overbroad broad allowances for CBI claims related to exposure-relevant information is warranted.</p> <p>Transparency: Policies should ensure that any descriptions of exposure information are clear and transparent in describing the scope and nature of the information and its limitations, including by addressing all of the elements specified above under Scope and Completeness and Quality.</p> <p>Policies should require that conclusions or recommendations be carefully written and explicitly qualified so as to limit their perceived and actual applicability to those settings for which information has been provided and deemed sufficient to warrant the conclusion or recommendation.</p> <p>Furthermore, the degree of uncertainty associated with a conclusion or recommendation should be stated and should reflect the extent of exposure information available. Lastly, policies should ensure that in the absence of good exposure information, exposure should be assumed possible or likely.</p> <p>Additional challenges</p> <p>Cumulative and aggregate exposures: A common limitation of exposure assessments in practice is to examine exposures only to single chemicals at single points in time, or from single sources or products, as if they occur in isolation from other exposures that are in fact relevant to understanding the true nature and magnitude of exposure. While understandable given the complexity involved in going further, this frequent failure to consider or even acknowledge the need to ultimately examine cumulative and aggregate exposures undermines the credibility of an exposure assessment. Policies, therefore, need to ensure that an accurate context is provided within which to judge a particular exposure assessment, one that accounts for factors such as:</p> <ul style="list-style-type: none"> • production, processing and use of the same chemical by multiple entities; • multiple uses of the chemical leading to actual or potential exposures; • multiple routes of exposure (direct, indirect) to a chemical; • continuous or periodic release of or exposure to a chemical; and • exposure to multiple chemicals producing the same/similar effects and/or acting by the same/similar mechanism(s) <p>Biomonitoring/environmental monitoring/health tracking: The ultimate arbiter of the value of exposure assessment is the extent to which its findings comport with reality. It is relatively rare for extensive data from actual environmental and biomonitoring to be available, and rarer still for health tracking statistics to be available that can be linked to particular exposures. Nonetheless, exposure assessment policies should ensure that such data are examined and incorporated where available, and should encourage the development of and public access to such data.</p> <p>Susceptible subpopulations: In addition to variation over time and space, exposure to a chemical or the effects arising from such exposure may differ among particular subsets of human or ecological populations. This variation may be due any number of factors, such as inherent differences in the subpopulations themselves (e.g., children's respiratory rates are higher than those of adults), differences with respect to proximity to, or reliance on activities associated with, particular sources of exposure (e.g., occupational exposure, dependence on a diet high in fish or groundwater as a drinking water source), or differences in sensitivity to a substance (e.g., sensitization, genetic susceptibilities). (Less understood at present are the analogous differences in ecological subpopulations.) Policies need to account for such variations and ensure protection of the most susceptible and sensitive sectors of potential exposed populations.</p> <p>[end]</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-47	<p>The Dose –Response Principle is Key to a Science-Based Program The Dose –Response Principle is Key to a Science-Based Program</p> <p>To protect public health and the environment, Cal-EPA needs to assure that the approaches under consideration within California are science-based and follow the dose-response principle. The principle of dose response underlies the scientific practice of pharmacology, and is the foundation of clinical therapeutics. However this principle, which is used to determine appropriate dosages and regimens for administration of therapeutic chemicals (pharmaceuticals), is also integral to the mechanisms through which chemicals of all kinds (pharmaceuticals as well as industrial chemicals) produce the unwanted effects, also known as toxicity. The dose-response principle stipulates that there is a direct relationship between the amount of exposure to a chemical and the level of response, regardless of the response being evaluated. Therefore dose-response is a principle that underpins both the science of pharmacology (therapeutic response) and toxicology (unwanted response). Most importantly, and often overlooked by scientists without pharmacology and/or toxicology backgrounds, is that there is a dose level below which no response occurs. Although there are some who suggest that any degree of exposure to a chemical affords unreasonable risk, this assertion is without scientific basis and in fact is just plain wrong. In fact, such assertions border on irresponsibility. In any science-based program dealing with chemical exposure, consideration of toxicity must be accompanied by an evaluation of the circumstances of exposure (the dose).</p> <p>Illustration of Dose-Response Principle</p> <p>The principles of dose-response are easily illustrated. Let's consider a chemical for which it has been proven that: 1) repeated chronic exposure to high doses of the chemical causes cancer in humans; 2) acute exposure to high doses of the chemical over a short period of time causes neurotoxicity in humans; and 3) exposing women to sufficient doses during pregnancy causes a developmental syndrome characterized by mental retardation and birth defects. Now, let's ask the question: Should this substance be considered "toxic to humans at any exposure level? Also: Would this substance be considered to pose a threat for "causing cancer or developmental toxicity" to humans at any level of exposure, no matter how minute? Should this substance be 'banned"? If we know that this chemical is present commonly in food at a concentration of about 5000 ppm, would exposure to this chemical pose a concern for inducing cancer or neurotoxicity? We may also want to ask about concern for cancer or neurotoxicity when foods containing the chemical are consumed by school aged children day in and day out. Would that pose an "unacceptable hazard or risk"? Would there be a risk of developmental toxicity in fetuses exposed to this chemical in the womb when their mothers ingest 30 grams of a food containing this chemical, one to three times a day, and the chemical is present at concentration of from 3000 to 5000 ppm?</p> <p>If a hazard-based approach, where any exposure would be considered unacceptable, is used to answer these questions, it is likely that one would answer "yes" to all of the questions above. But, using the science-based principles of toxicology and dose-response, the answer will be no. Why? Because knowledge about the toxicity of a substance at high doses, under specific conditions of exposure, is insufficient, by itself, to determine what the potential health risks will be to humans under other conditions of exposure. Dose-response principles dictate that if exposure is maintained below a "threshold" concentration in a tissue that is the target for toxicity, no toxic effects will be manifested. This principle applies to all chemicals, both natural and synthetic. In this case, the "threshold" concentration is that dose that is necessary for toxicity to occur.</p> <p>Illustration Revealed</p> <p>So what is the chemical being referred to above? It is ethanol. Certainly abuse of alcoholic beverages chronically (high, repeated exposures over years) can cause cancer, and clearly drinking alcohol during pregnancy places the developing fetus at risk of fetal alcohol syndrome. Yet, there is no risk of developing cancer or birth defects from eating two slices of bread a day, day in and day out, even though the ethanol content in bread has been shown to range from 400 to 10,000 ppm (Logan and Distefano 1998) . Nor is there a risk of developing ethanol-induced cancer or birth defects from ingesting fruits or fruit juices, even though fruits commonly contain ethanol at concentrations ranging from 60 to 900 ppm while fruit juice (e.g., apple juice) can contain up to 5000 ppm ethanol.</p> <p>The Dose-Response Principle –the Scientific Basis for Chemical Management</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>Clearly, it is not the chemical per se that poses the risk, it is the chemical within the context of dose, where the magnitude, frequency and duration of exposure, as well as the lifestage and susceptibility of the exposed individual, determine whether the chemical poses a potential risk to human health. In the case of human drugs used to treat disease, to see efficacy, a critical concentration of the drug at the target site is needed. The same principle applies to toxicity -- effects at high doses will not be realized at lower doses if the concentration falls below the target site threshold level. If the dose-response paradigm is rejected, then for therapeutic agents "cures" would be predicted to be triggered by any dose of a therapeutic agent. However, evidence-based medical practice rejects such homoeopathic beliefs. Similarly, by analogy, hazard-only based chemical regulatory approaches should be considered as belonging in the realm of "homeopathy" rather than evidence-based toxicology and epidemiology. It is only the consideration of toxicity in combination with dose-response and the level of exposure that provides the scientific basis for risk-based chemical management approaches.</p> <p>Laura M. Plunkett, Ph.D. DABT Integrative Biostrategies LLC</p>
F-TA-48	<p>Director, Environmental Sustainability Programs Ecolab Inc. supports science and risk-based chemical management policies that balance the 'triple bottom line' of sustainability: protection of the environment, assurance of product safety and promotion of innovation in the marketplace. Ecolab encourages the members of the California 'green' committees in the following specifics:</p> <ul style="list-style-type: none"> • Understand both the burdens and benefits of new regulatory proposals. • Find a way to successfully manage both toxicity and exposure (i.e., risk) while providing the solutions California needs. • Utilize risk assessment methods that integrate knowledge regarding potential hazards of chemicals with an understanding of their uses and exposures. • Look for product stewardship and risk management programs that establish mechanisms to assure exposures remain in the safe region for typical uses and foreseeable misuses; and • Enact laws and regulations that: <ul style="list-style-type: none"> • are science-based, • balance potential risks with benefits, • factor in existing scientific knowledge as well as reasonable uncertainties, and • consider the degree of risk to people and the environment." <p>We encourage California to study the availability of data now, particularly the availability of both hazard and exposure data, so that risk determinations can drive decision making. Please coordinate information needs with other governments and other sources of information. Do not reinvent the wheel. Ecolab is in the process of evaluating products/services to evaluate the 'greenness' and 'sustainability' of our products. One of the companies we have evaluated is Chemical Compliance Systems, Inc. (CCS) which specializes in ecological, health and safety compliance, chemical security, and hazardous material management services. CCS has a database containing 220,000 chemicals and more than 75,000,000 data elements comprising 43 key environmental metrics. I first became aware of CCS on June 28, 2007 when I heard Dr. George R. Thompson, President & CEO, giving a presentation called "Web-based Databases That Facilitate Chemical, Product and Process "Green" Assessments and Automated "Green" Cleaning Product Development or Acquisition Assessments" at the 2007 Green Chemistry & Engineering Conference, Washington DC (www.GCandE.org) For products we submitted to them, they organized the results in three categories Ecology, Human Health and Safety in their default product 'report card' which weighs constituent chemicals and their percentages in the formulation. They evaluated and produced 'report cards' on both concentrates and ready-to-use solutions on a number of our products, showing the sensitivity of their approach. The following procedure was used to produce each report card. For each metric, the chemical that is least sustainable/green is given a score zero and the most sustainable/green is assigned 100. The scores in between are normalized so that each chemical (all 220,000) has a quantitative normalized score. They also have a Cross-Reference Dictionary & Regulatory Lists. The Chemical Cross Reference Dictionary contains 550,000 records of purified</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>CAS numbers and their associated synonyms. This file facilitates accurate and complete materials management data searches and product substitution research. The Regulatory List of Lists file is comprised of over 650 international, federal, state and local regulated chemical lists and their associated data, as well as numerous CCS compiled lists (e.g., incompatible chemicals, hazard classes, etc.). CCS' modules compare a single chemical inventory file against these lists and generate a multitude of regulatory reports utilized by logistics, environmental/safety/ health, and chemical security professionals, as well as first responders.</p> <p>I strongly recommend California evaluate CCS's capabilities for application as part of California's Green Chemistry Initiative. I believe California's efforts will benefit from use of CCS's capabilities.</p>
F-TA-49	<p>Risk-Based Evaluation – the One Approach that Makes Sense</p> <p>Chemistry has enabled the development of countless products that consumers use each and every day, and consumers want to understand what impact these products may have on the environment and on their health. Industry shares this desire, and continues to strive to develop, produce and market products that are both beneficial and safe for people and the environment.</p> <p>Given the complex and multifaceted technical, societal and policy elements that are inherent in the design, manufacture, use and disposal of these products, one must consider a number of factors to effectively assure their safety. Approaches to safety that are performance based and flexible will provide the greatest benefits and allow the development of innovative approaches within the context of California's Green Chemistry Initiative. Industry works to minimize exposure of workers and the public to all chemicals that could be considered hazardous as used, and we pay particular attention to chemicals considered to be hazardous to humans or the environment. At the same time, industry uses chemicals that are least hazardous, and thus require the least expense in worker and public safeguards, consistent with the production of effective and economically accessible products. The two halves of risk--hazard and exposure--are always part of our planning and never far from our minds. Approaches that utilize risk-based evaluations of chemicals to determine efficacy and safety should serve as the foundation for decision making within programs that flow from the California Green Chemistry Initiative.</p> <p>While the toxicity of a substance is an important consideration in a risk based evaluation, the potential for toxicity must be considered in the context of exposure--including exposure level, route, duration and timing. Every substance can produce toxicity under certain exposure conditions. Even commonplace substances usually thought of as benign, such as water and table salt, can cause death when ingested at too high a dose over short periods of time. Conversely, even the most toxic substances pose virtually no risk when releases are controlled and exposures are minimized to levels below which, given an adequate margin of safety afforded by risk assessment techniques, the doses will not elicit adverse effects.</p> <p>For example, arsine gas is used to make microcontroller and microprocessor chips, and although arsine gas is highly toxic when inhaled, its "presence" in semiconductor chips in products used in every day life--computers, calculators, appliance microprocessors--poses no health hazards or risks from in-home normal and customary uses.</p> <p>So the question is not just, "How do we control toxic substances?", but also how do we successfully manage both toxicity and exposure--risk--while providing the solutions society needs? The answers to these questions are best provided through:</p> <p>1) Risk assessment methods that integrate knowledge regarding potential hazards of chemicals with an understanding of their uses and exposures;</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>2) Product stewardship and risk management programs that establish mechanisms to assure exposures remain in the safe region for typical uses and foreseeable misuses; and</p> <p>3) Laws and regulations that:</p> <ul style="list-style-type: none"> • are science-based, • balance potential risks with benefits, • factor in existing scientific knowledge as well as reasonable uncertainties, and • consider the degree of risk to people and the environment.
F-TA-50	<p>Quantitative Assessments of “Green” Munitions and Chemicals of Concern</p> <p>For many years, the Department of Defense (DOD) has made a concerted effort to reduce the potential impact of munition constituent and other chemicals on human health and the environment. In 2000, the U.S. Army Defense Ammunition Center (DAC) began working with Chemical Compliance Systems, Inc. (CCS) to use CCS’s extensive centralized Relational Chemical and Product Databases as the basis for a series of integrated, web-based modules within what has become the Munitions Analytical Compliance Suite (MACS). (CCS’s centralized databases included over 650 regulatory lists.) MACS includes eight modules. In a few months, the 9th and 10th automated modules the Emissions Risk Assessment and Human Health Risk Assessment—will be added. The most comprehensive of the MACS modules is the “Green” Munitions Analytical Compliance System (G-MACS). CCS developed G-MACS for DAC and PEO Ammunition Office in 2003. DAC and CCS co-own G-MACS, which has been available to 13 military munitions demilitarization facilities and two munitions management offices from coast to coast since its development. Military munitions design engineers can use the G-MACS’s 43 quantitative ecological, health and safety criteria (Endpoint Criteria) to eliminate or reduce the use of hazardous munitions constituents to create a theoretical munition composition that substitutes alternative components, parts or chemicals, and calculates the “green” grade for the total, component, or part composition in 5 to 20 seconds. G-MACS can also quickly identify which munition constituents have an impact on any of 112 state, federal or international regulations. This electronic design capability greatly reduces the labor and time required to design a “greener” munition.</p> <p>G-MACS also has application to other munitions activities (e.g., acquisition handling, demilitarization). Using a munition’s National Stock Number (NSN), G-MACS can calculate a munition’s overall “green” grade, its ecological, health and safety scores, and the 43 Endpoint Criteria scores within five to 10 seconds. Because all scores are normalized on a scale from 0 (worst) to 100 (best), comparisons of the “greenness” of two (or more) munitions is easy and quantitative. The evaluator can view individual scores, from worst to best, as a means to determine those constituents that need to be replaced to improve the “green” grade.</p> <p>When G-MACS is combined with CCS’s proprietary “Green” Process Analytical Compliance System (G-PACS) the four stages of a product life cycle (i.e., design; manufacture; stockpile management [e.g., handling, transportation, storage]; and disposal) can be evaluated. G-PACS uses the same 43 Endpoint Criteria as G-MACS, but analyzes the chemicals used in each step of the manufacturing process, or wastestream, rather than the constituents used in a munition.</p> <p>The MACS Chemicals of Concern (MACS-COC) module combines the objective and quantitative 43 Endpoint Criteria with quantitative Regulatory Impact and Inventory On-Hand Criteria to calculate a ranked Level of Concern listing for any facility’s inventory. This prioritized list can be beneficial in decision making, particularly in regard to inventory management, pollution prevention, and cleanup.</p> <p>I strongly recommend California evaluate CCS’s capabilities for application as part of California’s Green Chemistry Initiative. I believe California’s efforts will benefit from use of CCS’s capabilities. CCS’s web-based capabilities, their innovative approach, and their willingness to develop new or modified, integrated capabilities has proven beneficial to the Army’s efforts to both be good stewards of the environment and to implement its sustainability</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>program. Although I have not used them, I am aware of CCS's non-munitions capabilities, and believe that they would prove to provide tools of value to the civilian community and decision makers.</p>
F-TA-51	<p>Addressing the Data Gaps Is more data always better when it comes to understanding chemical safety? In many cases, the answer is yes, but when making this determination, it is important to understand the difference between a "data gap" and a "data need." WHAT DATA IS NEEDED? The U.S. EPA has clearly distinguished "data gaps" from "data needs" in the past. Data gaps are areas that could benefit from additional data, additional analyses, or clearer presentation, while "data needs" are data gaps requiring additional work before the potential risks can be adequately characterized – an important distinction to keep in mind. As was discussed at OEHHA's October 1 – 2 workshop on "Practical Decision-Making Tools," there are many models, tools, and guidance on structure-activity relationships to provide California with a tremendous amount of knowledge about chemicals without performing direct testing. The Canadian chemical prioritization under its Environmental Protection Act (CEPA) discussed at length in the workshop made extensive use of such modeling. The oft-touted EU REACH system initially proposed broad new testing mandates, but in its final version, the regulation backed away from that in deference to concerns over animal welfare. Sound scientific decision-making does not require the blunt approach of mindless box checking that only serves to require unnecessary data and animal testing, and burdens already strained public and private resources. Simply requiring unnecessary testing would only serve to put California seriously out-of-step with scientific consensus in the U.S., Europe, and the 30+ member countries of the Organization for Economic Co-operation and Development (OECD). WHAT CAN CALIFORNIA DO? 1. California should begin its assessment of information needs by first leveraging the information that already exists on chemicals. This includes accessing the information publicly available on High Production Volume (HPV) chemicals. Through the groundbreaking HPV Chemical Challenge Program, the OECD ICCA HPV program, and industry-led extensions of that work in the US, the chemical industry has already made and continues to make more information publicly available on more chemicals than any other voluntary or regulatory program globally. HPV chemicals in this program represent more than 95 percent of the U.S. market for commercial chemicals by volume. The information provided covers 17 endpoints internationally agreed by the OECD member countries as sufficient to initially assess chemical hazards including physical/chemical properties, environmental fate, ecotoxicity, and hazards to human health. Although this database is still being populated, there is a wealth of data and a solid platform from which the state of California can prioritize chemicals of interest, and evaluate further information needs. 2. Additionally, the HPV hazard data will be soon be supplemented with the information required by EPA's Inventory Update Rule. Specifically, in 2006 chemical manufacturers and importers of chemicals with site-specific annual production of 25,000 pounds or more were required to submit the following information for chemicals manufactured or imported in calendar year 2005:</p> <ul style="list-style-type: none"> • Basic company and facility site information • Chemical identify information • Specific chemical production volume • Chemical site limited status • Number of workers reasonably likely to be exposed to the chemical substance at the site of manufacture or import (in prescribed ranges); • Physical form(s) of the chemical substance as it leaves the submitter's possession, along with the associated percent production volume; and • Maximum concentration of the chemical substance as it leaves the submitter's possession (in prescribed ranges). <p>In addition, manufacturers and importers of chemicals with site-specific annual productions of 300,000 pounds or more were also required to provide the</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>following production and use information:</p> <ul style="list-style-type: none"> • Application - North American Industrial Classification System ("NAICS") codes that best describe the industrial activities conducted by the sites that use or process the substance; • Industrial functions of the chemical substances; • Approximate number of processing and use sites; • Estimated number of workers reasonably likely to be exposed to each chemical substance at all sites at which the chemical is used or processed; • Commercial and consumer uses of reportable chemical substances <p>o An indication of whether the commercial/consumer products are intended for use by children;</p> <p>o Maximum concentration of the reportable chemical substance in each commercial and consumer product category; and</p> <ul style="list-style-type: none"> • Estimated percentages of the submitter's production volume in each industrial function category and commercial and consumer product category. <p>A compilation of the IUR information will be made publicly available by EPA sometime by the end of this year, and will provide the core of basic chemical "mapping" data discussed in recent Green Chemistry dialogues.</p> <p>3. California should also work now to understand how it can leverage the regional chemical cooperation program recently announced by Canada, Mexico and the United States under the Security and Prosperity Partnership (SPP). The SPP program will leverage the information Canada has produced under its Chemical Management Program, and the related CEPA priority-setting. In addition, the U.S. has committed that by 2012 it will assess and initiate any action necessary on more than 9,000 existing chemicals produced in the U.S. This will include both HPV chemicals and Moderate Production Volume (MPV) chemicals.</p> <p>WHERE CAN CALIFORNIA GET THIS DATA?</p> <p>Identified below are websites where California can obtain a significant amount of information on chemicals that already exists.</p> <p>The HPV Challenge data is available at:</p> <ul style="list-style-type: none"> • http://www.epa.gov/hpv/pubs/hpvrstp.htm <p>A more user-friendly version of the above referenced database is being built, and should be complete later in 2007. An initial version of that database is available now at:</p> <ul style="list-style-type: none"> • http://www.epa.gov/hpvis/metadata.html. <p>Recently, the chemical industry announced that it is extending its work on HPV chemicals - calling it the Extended HPV Program or EHPV. The EHPV Program broadens the original initiative by calling on companies to provide health and environmental information on 573 chemicals that have become HPV since the initiation of the Challenge Program, and increases the scope of information requested for all sponsored HPV chemicals by asking companies to provide use and exposure information. Information from this program will be submitted to the EPA over the next four years.</p> <p>Additional information is being generated under the Voluntary Children's Chemical Evaluation Program (VCCEP), in which USEPA evaluates both hazard and exposure information submitted by companies which have volunteered to determine potential effects on children's health. This information is publicly available at:</p> <ul style="list-style-type: none"> • http://www.epa.gov/chemrtk/vccep/index.htm <p>Beyond the databases for these voluntary programs, there are numerous other publicly available government databases. The Toxic Substances Control Act Test Submission database, TSCATS, is a central system for the collection, maintenance, and dissemination of information on unpublished technical reports submitted by industry to EPA under TSCA. Studies on over 8,000 chemicals are categorized into three broad subject areas (health effects, environmental effects, and environmental fate). Searches can be conducted using these subject areas as well as indexing terms.</p> <ul style="list-style-type: none"> • http://www.syrres.com/eSc/tscats_info.htm

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>EPA and its Office of Research and Development maintain an electronic database called the Integrated Risk Information System (IRIS) and it contains descriptive and quantitative information on human health effects that may result from exposure to various chemicals in the environment. IRIS was initially developed for EPA staff in response to a growing demand for consistent information on chemical substances for use in risk assessments, decision-making and regulatory activities. Information in IRIS is intended for those without extensive training in toxicology, but with some knowledge of health sciences. The heart of the IRIS system is its collection of computer files covering individual chemicals.</p> <ul style="list-style-type: none"> • http://www.epa.gov/iris/ <p>The European Chemical Substance Information System (ESIS) is an electronic system that provides information on both new and existing substances in the EU. It includes proposed classification and labeling for 3,300 chemicals, information and data for roughly 2,500 EU HPV chemicals and final risk assessment reports for chemicals with completed assessments.</p> <ul style="list-style-type: none"> • http://ecb.jrc.it/ESIS/ <p>The EU's REACH legislation will eventually make available hazard data on all chemicals in the European market, as well as use-specific chemical risk assessments for chemicals on the European market above a specific threshold. Data will be publicly available, fully searchable, and formatted in software known as IUCLID.</p> <p>The International Council of Chemical Associations has committed to submit data and assessments for 1,000 global HPV chemicals to the 30 developed nations of the OECD for government assessment. To date, 667 chemicals have been assessed under the OECD program and work is continuing. OECD assessments are published as soon as they are completed on the OECD website. The data included in those assessments are also available, via the United Nations Environment Program (UNEP).</p> <ul style="list-style-type: none"> • http://cs3-hq.oecd.org/scripts/hpv/ • http://www.chem.unep.ch/irptc/sids/OECDSEIDS/sidpub.html <p>The EXICHEM database is a pointer system on current, planned and completed activities on existing chemicals in OECD member countries and other relevant bodies. It was created to provide information for the OECD member countries on "who is doing what with which chemicals", (e.g. information gathering, testing, evaluation), in order to assist countries that are identifying opportunities for co-operation.</p> <ul style="list-style-type: none"> • http://webdomino1.oecd.org/ehs/exichem.nsf <p>The International Program on Chemical Safety (IPCS - a joint program of UNEP, ILO and WHO) developed INCHEM - a freely available collection of internationally peer-reviewed documents about chemicals and chemical safety. It was initiated in 2003 in response to priorities established by the Intergovernmental Forum on Chemical Safety (IFCS) and provides convenient worldwide full-text electronic access to chemical safety-related documents provided by intergovernmental organizations. All documents referenced by INCHEM contain hazard information and the site can be queried by key-words and free text. INCHEM contains Environmental Health Criteria documents, and cancer assessments by the International Agency for Research on Cancer.</p> <ul style="list-style-type: none"> • http://www.inchem.org/
	<p>Innovation and Regulation</p> <p>Some of the suggestions posted in the Conversation with California appear to recommend that the State adopt a regulatory framework that would somehow coerce or command companies to innovate and develop "green" products or processes. The underlying assumptions seem to be that (1) the current system somehow stymies innovation and (2) forced regulation is the only way to bring about innovation. Unfortunately, neither of these assumptions are supported by the facts.</p>
F-TA-52	Let's look at the current U.S. chemical regulatory system and opportunities to bring new, better chemicals to market (a surrogate for measuring

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>innovation). A comparison of the US system against the pre-REACH European system found that opportunities for the innovation were stifled for the European companies, not the US companies. European firms showed a lower economic performance, lower R&D productivity, lower patent productivity, lower number of polymer patents, and lower numbers of new chemical notifications (Fleisher, Manfred, Sabine Kelm, Deborah Palm. Regulation and Innovation in the Chemical Industry. Social Science Research Center Berlin. October 2000). Our current system allows companies to use the sophisticated techniques developed by EPA to assess potential risks for chemicals and incorporate the findings into future business decisions. Thus, far from being a barrier to innovation, the U.S. regulatory system confers some important benefits in the breadth and speed of technological progress. What about the second assumption that we need to regulate to force innovation? If "green" chemistry is to work, there must be inter-disciplinary collaboration among a variety of experts in chemistry, toxicology and environmental science that work in business, government and academia. No government can dictate precisely how this process for innovation and collaboration should occur. It will be unique for each circumstance. A one-size-fits-all regulatory framework will not only fail to bring about new innovation; it could, in fact, stifle ongoing innovative processes.</p> <p>In addition, stricter management controls (including bans) of existing chemicals provide no guarantee of "greener" outcomes, although this has been implied by others. Green chemistry explicitly identifies materials or processes that reduce health and environmental impact while maintaining or improving cost-effective performance. A regulatory action taken against an existing chemical may or may not be supported by a careful analysis of the health and environmental impact of substitute products or processes; and those substitutes may or may not provide cost-effective performance to meet the specific societal need. Unless such an analysis occurs, it is not clear that regulatory action improves health and environmental protection. The reality is many chemical companies are already addressing green chemistry objectives through their ongoing product stewardship work. Product stewardship is the practice of making health, safety and environmental protection an integral part of the full life cycle of chemical products. It includes evaluations of chemical products and their uses to help assure that those products deliver their intended benefits to society while protecting public health and the environment. As part of Responsible Care®, members of the American Chemistry Council employ a rigorous management system that is certified by third-party auditors. In addition to numerous other elements, those auditors verify that our companies have systems to manage risk associated with chemical products and that those systems include management of product development, transport, use and disposal in a safe and secure manner. Companies are also audited on their programs to protect the environment and conserve programs, as well as processes to dialogue with stakeholders about the organization's impact on human health and the environment. ACC member companies have a track record of bringing new, innovative products to market that address new societal needs, including health and environmental protection.</p> <p>In addition, shifting market expectations and liability regimes are already at work in instituting the increased attention to health and environmental effects. The market is already leading the way -- the risk of a government "meat-ax" could stifle that innovation in its tracks. ACC agrees that government can and should encourage the collaborations that can produce "green" chemistry, through mechanisms such as the sharing of expertise, financial support for research, information exchange and public education. In fact, a variety of federal agencies (including EPA and DOE), the private sector, professional associations such as the American Chemical Society, Non-Governmental Organization (NGO) groups and universities are currently working together to encourage green chemistry strategies. The government can and has provided support for green chemistry outside the framework of TSCA. Those efforts can, of course, be enhanced further to improve U.S. leadership in the field.</p> <p>If the state of California truly wants to lead in green chemistry, it needs to be focused on encouraging innovations through incentives. The economic drag of yet more rules, regulations and restrictions will not foster the creation of new products or, more importantly, their development and diffusion across the economy</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
F-TA-53	<p>Quantitative Web-based "Green" Munitions Analyses</p> <p>The United States Army Defense Ammunition Center (DAC) has partnered with Chemical Compliance Systems, Inc. (CCS) to develop munition analytical compliance capabilities for the past eight years. Along with other DOD organizations, in 2003, DAC contracted CCS to develop a tool that would assist the Army in efforts to assess munitions from a "green" perspective. What came out of this was a Web-based tool known as the "Green" Munitions Analytical Compliance System, or G-MACS. Since no green criteria had previously been established for munitions, or any other product, the development of G-MACS by CCS with 43 ecological health and safety "green" criteria made a giant step forward in helping our design and manufacturing installations with an automated capability to assess the "greenness" of munition constituents early in the life cycle. The "green" scoring criteria in G-MACS was programmed to be flexible and dynamic enough to be modified as needed to support any environmental factors and/or guidelines on "greenness" that might be developed. G-MACS is unique in that it can, in combination with the CCS "Green" Process Analytical Compliance System (G-PACS), be used to "score" a munition for "greenness" throughout the life cycle (cradle to cradle). G-MACS, along with other CCS systems such as their "Green" Product Compliance Analytical System (GP-CAS), and "Green" Process Analytical Compliance System (G-PACS), could be utilized to provide a complete life cycle "green" product measuring tool that not only covers munition constituents but also, paints, pharmaceuticals, cleaning products, pure chemicals, etc. After a number of years of working with CCS and knowing the tools that they developed such as MACS and G-MACS, DAC is confident that the State of California could benefit by utilizing CCS and their GP-CAS, G-PACS and G-MACS Web-based tools.</p>
F-TA-54	<p>ACC's Perspectives on California's Green Chemistry Initiative</p> <p>The business of American chemistry is built on fundamental science. As a result, the members of the American Chemistry Council (ACC) support science and risk based chemical management policies that simultaneously protect health and the environment, assure product safety and promote innovation in the marketplace. Our industry has always relied upon innovation in its development of products and processes to meet customer needs and expectations, address new regulatory requirements, and to fulfill voluntary commitments to programs that go beyond the law. It's important to note that "Green Chemistry" is a way of doing business was never intended to be applied as a government mandate through regulation or legislation. Indeed, the American Chemical Society's Green Chemistry Institute states:</p> <p>"Green Chemistry differs from previous approaches to many environmental issues. Rather than using regulatory restrictions, it unleashes the creativity and innovation of our scientists and engineers in designing and discovering the next generation of chemicals and materials so that they provide increased performance and increased value while meeting all goals to protect and enhance human health and the environment."</p> <p>So how should California approach green chemistry? We think there are a number of threshold issues DTSC must be prepared to address in making recommendations on the basis of this initiative:</p> <ol style="list-style-type: none"> 1. Make a baseline assessment of chemical information that is already available to the State. In ACC's view, there is a lot of information already publicly available on chemicals in commerce, and a lot more coming on line, from other States, the federal government, foreign governments, intergovernmental organizations, and even non-governmental organizations (including industry). DTSC should be studying the availability of data now, particularly the availability of both hazard and exposure data, so that risk determinations can drive decision making. It simply makes sense for California to coordinate on information needs with other governments and other sources of information – why reinvent the wheel? More importantly, DTSC doesn't have to wait until the end of its Green Chemistry Initiative to get the ball rolling on this important element. 2. Reiterate the commitment that the Green Chemistry Initiative will be governed by science. Many entries in the "Conversation with California" appear to be based on an underlying assumption that the current design of products and manufacturing processes is not adequately protective of health and the environment, and recommend that DTSC suggest hazard-based approaches to decision making. That's not good policy. As DTSC acknowledged in the launch of the Initiative, science should govern the process. Americans (and Californians) are living longer, healthier, and safer lives than ever before, and significant improvements have been made in public health and the environment. An extensive legal and regulatory framework, coupled with myriad

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>voluntary programs, initiatives and innovations, has led to those advances in health and the environment. We hope that the Green Chemistry Initiative will examine the basis for the assumptions about the adequacy of current protective measures as policy options are identified.</p> <p>3. Commit to understand both the burdens and benefits of new regulatory proposals. One University of California report on chemical regulation in California noted that businesses in California labor under a “labyrinth” of rules enforced by a number of agencies. Interestingly, many of the entries in the “Conversation with California” argue that even more regulation is necessary! Some have referred to Europe’s new REACH regulation as the solution – taking the interesting position that a regulatory program that is not yet even operating is now a benchmark for chemical regulation.</p> <p>4. Acknowledge that engineering is a part of “green chemistry.” ACC member companies are leaders in green chemistry and green engineering in their operations and have been honored for their efforts. Modifications in process technology have significant potential to minimize possible adverse health or environmental effects of chemical substances. Many of the entries in the “Conversation with California” appear to focus largely on promoting product substitution – the simplistic substitution of one hazardous chemical for a less hazardous alternative – without regard to the consequences of such an approach, and without recognizing the important role that process improvements can have. It’s time DTSC made clear in this dialogue that engineering is every bit as important as product improvements.</p> <p>ACC and its member companies believe that the Conversation with California should address a number of the complex, specific issues that are implicated by the Initiative. In the weeks ahead, we intend to address issues like the role of product stewardship, the role of regulation in promoting innovation, how California might stimulate “green chemistry” and “green engineering”, and the four broad categories on which DTSC has invited specific comment.</p> <p>Mike Walls Managing Director, Regulatory and Technical Affairs American Chemistry Council</p>
F-TA-55	<p>Quantitative Green Ranking for All Chemicals</p> <p>A database has been created with over 220,000 chemicals (all listed to date) and all cross reference names with filters for all state and federal regulatory lists. Each chemical has assigned the 33 federal EPA Environmentally Preferred Characteristics (EPP) and additional credible Characteristics given by regulatory agencies CAL EPA, other key USA states and key countries totaling 41 key environmental performance characteristics (e.g. LD 50, excess lifetime cancer risk, flammability, health hazard indices etc). These characteristics may be organized into three categories Ecology, Human Health and Safety. This database, updated annually, contains over 75,000,000 elements to rank products as a function of the chemicals and chemical percentages.</p> <p>For each environmental characteristic, the chemical that is least compatible with living systems is given a score zero and the most compatible the score one hundred. The scores in between are normalized so that each chemical (all 220,000) has a quantitative normalized score.</p> <p>The navy tested eight adhesives meeting MIL-SPEC by providing the chemicals that make up the products. The chemicals were transmitted via the on-station web site database of products Hazardous Material Management System (HMMS) to Chemical Compliance System's (CCS; www.chemply.com) web site. A report of all 41 Environmental Characteristics was automatically generated, and with equal weights as the default mode, a normalized score for Ecology, Human Health and Safety and an overall Environmental Score (Green Rank Score to make the best decision for the environment).</p> <p>This tool may be used for face cream, road paint, military aircraft munitions or paint, any product with a list of chemicals and percentage created a true quantitative score.</p> <p>This tool may be utilized by academia, government, industry, householders, military etc to formulate-design and or determine the best products compatible with the ecology, human health and safety.</p> <p>The vision is that the state of California purchases the tool for the USA to be utilized for no cost by all so that the environmental may improve rapidly. This would become the biggest pollution prevention project ever and the most cost effective to reduce pollution through source reduction. The federal</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>EPA may also participate. With this tool in place via a web site sponsored by CAL EPA and or FED EPA, the products most compatible with the ecology, human health and safety may be chosen by the consumer. Also, formulations by academia, the government, industry etc may be optimized for environmental compatibility. The user simply inputs the chemical makeup of a product and the web site generates a complete report of the EPA EPP characteristics (and others from the key state and countries if desired) and a normalized score for the ecology, human health and safety and a total environmental score (green rank). This would be easy to put the information into a green label.</p> <p>Dr. George Thompson, PHD in Chemical Engineering developed this tool taking over 25 years for the DOD through a company www.chemply.com. The rest of the nation should benefit from this significant work.</p>
F-TA-56	<p>Government test all new products. Government test all new products.</p>
F-TA-57	<p>Legislative Changes</p> <p>I have conducted research on safer alternatives for the last 30 years. Over the last 17 years, my organization, the Institute for Research and Technical Assistance (IRTA), has identified, tested, developed and demonstrated safer alternatives in a range of different applications and industries. Over that period, IRTA has assisted hundreds of facilities in California in adopting alternatives. IRTA has worked on alternatives in dry cleaning, repair and maintenance cleaning, handwipe cleaning, batch loaded cold cleaning, electronics cleaning, vapor degreasing, printing cleanup, paint stripping, coatings and adhesives. In some cases, whole industries have adopted alternatives developed and tested by IRTA.</p> <p>Over the course of this work, I have learned much about how the system works and have become aware that, in order to ensure that safer alternatives are used, legislative changes are required. First, California needs a California Toxic Substances Control Act (CAL TSCA). CAL TSCA would require all new chemicals sold into California to be tested for toxicity before they are marketed. A set of toxicity tests that would be required would be developed by a consensus group of toxicologists with input from DTSC and the public. The manufacturers or distributors would have to conduct these toxicity tests at their own expense. CAL TSCA would also establish a set of toxicity tests that would be required for existing chemicals, chemicals that are already being used and marketed in California. In a few cases, the toxicity test information would already be available; in other cases, the tests would have to be performed. When the toxicity test data were provided by the manufacturers or suppliers, DTSC, with the help of the Office of Environmental Health Hazard Assessment (OEHHA), would evaluate the results and decide whether the chemical could be marketed (new chemicals) or whether the chemical would have to be removed from the market (existing chemicals). The criteria for deciding on this up or down vote would be predetermined by the group of toxicologists who designed the tests and DTSC with public input.</p> <p>Many chemicals that have toxicity problems have come on the market in the last 10 years. These chemicals are used extensively and exposure of workers and community members is high. An example is n-propyl bromide (NPB). NPB is a reproductive toxin in animals and has also caused nerve damage. It is currently undergoing testing for carcinogenicity. When the chemical was first marketed, EPA did not require toxicity testing for the substance under Federal TSCA. The chemical has been listed on California's Proposition 65 but is not on the state toxics list. Cal/OSHA and Federal OSHA have not established worker exposure levels for the chemical. NPB is used in vapor degreasing. The dry cleaning industry is considering using it as a dry cleaning solvent and there is nothing that would prevent this. Once chemicals like NPB are on the market, there is no mechanism for preventing their use in dispersive applications. Adopting a CAL TSCA would allow the state to deal with chemicals like NPB.</p> <p>Second, OEHHA has the responsibility of determining whether chemicals pose an unacceptable risk and that agency has few resources. OEHHA's budget should be expanded substantially. Dry cleaners in the state have been using a dry cleaning solvent called D5 for several years and D5 has</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

TOXIC BY ACCIDENT (FORUM)

Number	Full Comment
	<p>caused cancer in laboratory animals. OEHHA has been evaluating toxicity test results to determine whether D5 is a threat but has not completed their analysis. In the meantime, no regulatory agency can regulate D5 and the dry cleaning industry is using it extensively. Giving OEHHA more resources could speed the evaluation process and give high priority to the new work the agency would be called upon to do under CAL TSCA.</p> <p>Third, the California Air Resources Board (CARB) is limited in their regulatory authority and their authority should be expanded. CARB regulates consumer products but is forbidden from regulating away a whole product type. In other words, if a low-VOC or low toxicity nonaerosol product is available and could substitute for a higher VOC more toxic aerosol product, CARB cannot regulate the VOC content or toxicity of the aerosol product on that basis. CARB can set a lower VOC limit or ban certain toxics in the aerosol product if there are other aerosol products with lower VOC content or no toxics. Aerosol products are inherently not green. They lead to a very large waste stream and they rely on propellants that are often VOCs or greenhouse gases. As an example, consider antiperspirants and deoderants. Roll on products have very low or no VOC content. In contrast, aerosol products have a higher VOC content and contain propellants that may be greenhouse gases or VOCs. Expanding CARB's authority would permit the agency to establish VOC and toxics limits based on the nonaerosol products. This would allow the state to forbid the use of aerosol products in cases where there are greener products. It would also allow CARB to forbid the use of certain toxics as determined under CAL TSCA as a threat.</p> <p>The three legislative suggestions described here would make it far easier to restrict the use of certain materials that cause problems for health and the environment. The strategy would provide an incentive for manufacturers and suppliers to find and market greener products. This would result in better protection of the health of consumers and workers and of the environment in California.</p>
F-TA-58	<p>Lord Professor of Chemistry Expand education in building a sustainable technology base.</p> <ul style="list-style-type: none"> • Encourage that chemists should have university courses in Green Chemistry emphasizing toxicity and ecotoxicity. • Encourage universities to develop green business and law courses, etc. • Require REACH-like analysis/reporting/removal of toxics in products. • Expand State testing of products to detect hidden toxics in all products and to produce a level playing field internationally—police your laws. • Develop a process for rapid removal of products found to be toxic by new studies that is fair to industry—State subsidized transformations?

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-1	<p>Dear Green Chemistry Advocates:</p> <p>Ethanol from green plant material is getting a lot of press lately as a fuel substitute. Ethanol can be used for much more than just fuel. 15 years ago I raised the idea of conducting life cycle comparisons of products produced from green plants (ethanol), vs petroleum products. The idea was that it might be shown that less hazardous waste would be produced from manufacture and use of products based on green plant chemical feedstock vs petrochemical feedstock. Kim Wilhelm may remember the idea. I raised it with him when we were both with DTSC's Alternative Technology Division. The time was not right. I'd like to take this opportunity to raise the idea again. While in college in the early 1980s, I did some research on fuel grade ethanol production. My research led me to a Fellow at UC Berkeley, Dr. Melvin Calvin, who was pioneering research on industrial chemicals from plant fibers and plant oils. A new process called acid hydrolysis showed promise for converting plant cellulose to sugar, allowing greater ethanol yields from green plants. Also, it has been known for many years that alcohols from plants and plant fiber can also be used as feedstock for producing plastics, synthetic fibers, cleaners, animal feed, and other products. This was done during WWII, when oil was rationed. The time may now be right for doing life cycle comparisons of petrochemical products to products produced from plant fiber.</p> <p>How would the costs compare? How would the quality compare? Would there be less toxic wastes produced? Would the wastes be less toxic? Would the wastes be less mobile in the environment? How would water use play into the study? Would the waste be easier to remediate? If the time is right, and you could use some help, I volunteer to work on the studies and write up the results. Thanks for the opportunity to bring up the idea again. Sincerely,</p> <p>Mike Vivas, P.E. Department of Toxic Substances Control Northern California Central Cleanup Operations Branch</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-2	<p>Dear Director Gorsen,I understand that you are soliciting suggestions for your green chemistry initiative.First, I applaud you for starting a discussion about a proactive step toward reducing the use and release of toxic substances in our environments. The tools and approaches now in use are too piecemeal and not producing fundamental solutions. Second, an initial challenge will be to develop an initiative that is reality-based. At present, there is little actual practice of "green chemistry" as that term is defined. What would be the drivers that would cause the designers and manufacturers of chemicals currently in use to redesign them? This is an important public policy challenge, as those who have invested in the status quo are not necessarily most likely to seek to change it. In addition, how to design materials to avoid threats to health and the environment is still a research question, so an effective strategy will need to bridge the considerable distance between where we are now and where you want to go. Third, I believe that it is important to understand that there are many potential decision makers who can and will influence what chemicals are used and released into the environment. These include every consumer who decides what kind of soap to buy and whether to use baits or traps for pests. This includes every company that purchases products for use in their business. It includes every entity that selects materials to use in manufacturing their own products. The information needs of these entities are diverse, but finding ways to help all of these entities distinguish between the more toxic and the less toxic alternative is a critically important need. This does not seem to be reflected in the current description of the initiative, which focuses more on what Cal EPA will do. Cal EPA can do a lot but not everything. Finally, the question of how to generate the data stream needed for unbiased assessment of the relative toxicity of various compounds (as well as processes and other types of things contemplated) needs serious attention. None of the chemicals policy initiatives have solved this problem. They are mostly relying on the kinds of testing approaches that have been in use for the last 30 years, focused on only some of the toxic effects that are of concern. It is essential to be able to accurately distinguish those compounds that are more toxic from those that are less toxic for "green chemistry," toxics use reduction, substitution or any of these kinds of approaches to lead to better decisions. We need to get serious about using the new knowledge and methods that have been generated in the last 30 years to do something smarter and better than what has been done in the past. We also need to recognize that even the kinds of data that we have had in the past is not being generated very much in the US any more. These issues need to be addressed with genuine expertise and commitment to the public interest, to avoid potential having well intended initiatives become another form of green-washing.Thank you for your leadership.cheersadkAmy D. Kyle, PhD MPHAssociate Research Scientist and LecturerProject on Science and Policy for Health and EnvironmentSchool of Public Health, University of California, Berkeley</p>
J-C2C-3	<p>Please don't lose sight of the environmental advantages provided by plastics. These include ... a less-hospitable surface for bacterial growth (vs paper bags, wood), ... less accidental injury (vs glass, metal), ... lower energy consumption from start to finish (especially PVC, which uses less energy in manufacture and use than most all other materials), and ... potential for energy recovery either via incineration-to-power or recycling that replaces new material manufacture (the most meaningful form of recycling.Please also don't get caught by pseudoscience that talks about harmful chemicals as if "chemicals" were a dirty word (we are all made up of chemicals), or a passion for "natural" as sacred, as if man-made/synthetic/processed were evil. The words are grossly abused, as some of the most toxic substances are "natural" (e.g., snake venom, tobacco) and many "chemicals" make our lives safer and healthier (safe drinking and swimming water, synthetic insulin, and countless household and medicinal "chemicals"). Lastly, don't lose sight of an old medical maxim, "the dose makes the poison." It's how much that counts, so that if someone says "that contains "xyz" we have to know how much xyz, and what the effects of that much might be. There are certainly substances that should be minimized and avoided, and in fact California is a leader in raising the nation's consciousness to this effect. Please continue that leadership with sound scientific and medical bases, and don't be swayed by people with pre-set agendas, often well-meaning but nonetheless wrong.Allan L. Griff, Consulting Engineer</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-4	<p>THOUGHT STARTER ON CALIFORNIA GREEN CHEMISTRY INITIATIVE Tom Jacob – DuPont, Sacramento tom.jacob@usa.dupont.com For most of the last century, DuPont has been among the largest chemical producers, globally. Our 200 year heritage of leadership in workplace safety, toxicology, science and technology positioned us as a premier company in safely handling hazardous chemicals; and in innovation in chemicals that has delivered extraordinary value across society. Creation of nylon is perhaps most familiar, but that is but one example among the 34,000 patents to which DuPont’s innovation has led. TRANSITION TO SUSTAINABILITY: One of the more recent examples of DuPont innovation received a Presidential Green Chemistry Challenge Award. Such awards are always welcome recognition, but this one is a particularly significant example for the CalEPA initiative. The Award was for microbial production of 1,3-propanediol – a critical ingredient in production of an entire new polymer platform (DuPont Sorona). It is the first example of a highly engineered microorganism used to convert a renewable resource into a chemical at high volume. In this case, the use of this microbe allows replacement of a petroleum feedstock with corn, with additional benefits of reducing energy consumption in manufacturing as well as improving process safety. Commercial production of this polymer began last year. This example is significant for the Green Chemistry Initiative in part because it is not “chemistry” as we have traditionally known it. Rather, it is the melding of chemistry with biology, with the aim of delivering a product that has broad value across society, but doing so in a way that is less dependant upon depleting resources, safer to manufacture, and more economical to produce than traditional alternatives – in short, that is more sustainable both environmentally and economically. DuPont has spent much of the past decade reshaping our business portfolio to position us as an agent of such “sustainable growth.” Our transformation is certainly not yet complete, but it is noteworthy that it is well underway. Importantly, we are not alone in sensing and anticipating this as a broader societal transformation (a quick review of the other “Green Chemistry” award winners illustrates this). Transition toward more sustainable practices that still deliver the goods and services that societies expect represents a paradigm-shift from industry’s historic role as, in a sense, the “enabler” of mass society. The new paradigm frames a more complex expectation of industry as an enabler of long term, more sustainable well-being, with a new emphasis on social and environmental responsibility. California’s Green Chemistry Initiative can position the State for leadership as this transition proceeds. It is important to keep in mind, however, that this transition is already underway, and ill-conceived state intervention can just as easily retard its progress and thus the potential for California leadership. “GRAND CHALLENGES” FOR THE CHEMICAL INDUSTRY: The application of science and innovation to meet society’s needs and solve its challenges has always been a significant contribution of industry, generally, and the chemical industry in particular. This role of the chemical industry is no less vital today, but the challenges differ, as does the societal expectation of how we will approach those challenges. The 2006 UC report on “Green Chemistry in California” made a useful contribution to framing that larger societal need. It pointed to a 2005 conference of the US National Academy of Sciences. The focus was on the “Grand Challenges and Research Needs” for the chemical industry in both becoming more sustainable as an industry, and enabling society as a whole to advance toward greater sustainability. These include advancing our understanding of toxicology, application of principles of green and sustainable chemistry, and extending the use and sophistication of the life cycle analysis integral to green chemistry. Importantly, this broad agenda of challenges for which the society is depending upon an agile and innovative chemical industry goes beyond the more narrow conceptions of “green chemistry.” The “Grand Challenges” (to which California Initiative should contribute) also include: • Renewable Chemical Feedstocks • Renewable Fuels • Energy Intensity of Chemical Processing • Separation, Sequestration and Utilization of Carbon Dioxide • Sustainable Education As noted above, the transformation necessary to address these challenges has already begun. It is a product of the same broad evolution in societal expectations that is also driving the movement toward green chemistry, generally, and the California Green Chemistry Initiative, specifically. “GREEN CHEMISTRY” AND CALIFORNIA: One of the benefits anticipated for the State from taking on leadership roles in sustainability issues such as climate change and green chemistry is that the State will become a nexus for answers to the World’s sustainability challenges, with economic benefits in addition to the direct benefits deriving from more sustainable practices. The State is anticipating precisely such “innovation” leadership from its climate initiative, which poses significant economic implications for many of the manufacturing enterprises remaining in California. The State’s future is now heavily dependant upon alternative fuels, advances in sustainable production and the like, that track very closely the “Grand Challenges” above. Importantly, industries innovating to meet such needs may, or may not, end up being based in California. In today’s global economy, simply accelerating emergence of a market does not guarantee that innovation and production to feed that market will locate there. The migration of semiconductor fabrication out of California offers an interesting case in point. One of the realities in green</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
	<p>chemistry is that the “chemical industry” in California has changed in recent decades. Much of the primary chemical production has consolidated in other states and, in particular, migrated to China and elsewhere in the developing World. The dynamics for this are complex, but at its core are, again, realities of global economic competition. This exaggerates the impact of a wide range of factors of production, but the net is simply that the State is not “self-contained” in its efforts to advance notions of green chemistry. The description of intent for the Green Chemistry Initiative certainly implies that regulatory outcomes are anticipated. In that context, both already-emerging efforts of industry to fashion more sustainable practices and the fact that many primary chemical producers are not in-State, argue for very careful consideration of any regulatory proposals. This is particularly the case where unilateral state initiatives are contemplated, which must ultimately nest within any larger national regulatory structure. Additionally, there is the growing global regulatory structure created by treaties such as the Stockholm and Rotterdam Conventions, framing systematic international approaches to persistent toxins and emerging chemicals of concern. A strategically appropriate state regulatory framework would hopefully offer incentives that reward innovation that enhances sustainability – the kind that accelerates the evolution that has already begun within industry. Innovation, however, is not narrowly a function of regulation, and it is possible for ill-conceived regulatory approaches to inhibit innovation by being overly prescriptive. It is also possible to discourage in-State investment in the kinds of innovative R&D and manufacturing sought, by imposing regulatory burden beyond what is necessary, effectively penalizing even willing industry versus competitive opportunities in other states or countries.</p> <p>PRINCIPLES OF GREEN CHEMISTRY: The “Principles of Green Chemistry” that evolved from the work of John Warner and Paul Anastas represent a challenge to the chemicals value-chain, beginning with the primary chemical producers, but extending downstream throughout the economy. These capture essential notions of the transition to sustainable growth, and are very appropriate as a point of reference in the Green Chemistry Initiative. However, the aim is integration of these more systematically into R&D and design of products, rather than the traditional focus of health and environmental regulations on appropriate use of products. Such design questions relating to chemicals tend to be dominantly the product of corporate (and to a degree, academic) research that is often distant from any regulatory interface, beyond basic workplace safety considerations and laboratory standards. The challenge in advancing these principles is therefore one of stimulating education and awareness in these key bastions. It is important to note that these principles and their challenge are effectively calling for an acceleration of a process already under way. They capture essential notions of that should be integrated into product design, but do not exist in a vacuum. There are forces already at work (particularly in the US) to stimulate greater attention to these dimensions of product design. To understand this, it is useful to rearrange the 12 Principles. They actually fall into two basic categories – those aimed at minimizing “environmental footprint” (waste and resources consumption) and those aimed at reducing risk.</p> <p>Minimize Environmental Footprint: Eight of the 12 Principles essentially argue for more explicit attention to pollution prevention and reducing resource consumption – in essence, lifecycle consideration of “environmental footprint.” These concepts have been evolving for decades as areas of increasing focus within industry. The chemical industry has been at the forefront in application of lifecycle analysis. DuPont, for example, systematically applies such analyses in the context of internal product stewardship reviews. Reducing hazardous waste has been a major consideration ever since the “Love Canal” era. Likewise, the US Toxic Release Inventory begun in the early ‘90s focused industry attention on reducing waste, generally. The potential benefits of reducing energy and natural resource consumption has long been a major consideration in some industries, but the oil embargo’s of the ‘70s broadened the number of industries viewing energy as a significant factor of production. In this larger context, the great contribution of the Green Chemistry Principles is to translate these broad drivers into very specific decision contexts of chemical design and engineering. This linkage has been taking root in many companies. The challenge is to broaden, deepen and accelerate that more explicit focus by applying the following principles:</p> <ul style="list-style-type: none"> • Prevent waste: Design chemical syntheses to prevent waste, leaving no waste to treat or cleanup. • Use catalysts, not stoichiometric reagents: Minimize waste by using catalytic reactions. Catalysts are used in small amounts and can carry out a single reaction many times. They are preferable to stoichiometric reagents, which are used in excess and work only once. • Avoid chemical derivatives: Avoid using blocking or protecting groups or any temporary modifications if possible. Derivatives use additional reagents and generate waste. • Maximize atom economy: Design syntheses so that the final product contains the maximum proportion of the starting materials. There should be few, if any, wasted atoms. • Design chemicals and products to degrade after use: Design chemical products to break down to innocuous substances after use so that they do not accumulate in the environment. • Analyze in real time to prevent pollution: Include in-process real-time monitoring and control during syntheses to minimize or eliminate the formation of byproducts. • Use renewable feedstocks: Use raw materials and feedstocks that are renewable rather than depleting. Renewable feedstocks are often made from agricultural products or are the wastes of other processes;

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
	<p>depleting feedstocks are made from fossil fuels (petroleum, natural gas, or coal) or are mined. • Increase energy efficiency: Run chemical reactions at background or room temperature and pressure whenever possible. Reduce Risk: Four of the 12 Principles are specifically directed at reducing risk associated with chemical products and their production. Here as well, attention has been evolving for decades, in significant part as a function of evolution in science, technology (esp. in detection limits) and our general understanding of chemical risk. Attention to this dimension of chemicals experienced a step-change with the adoption of the Toxic Substances Control Act (TSCA) in the US in 1979 (and similar laws in Europe and elsewhere). Development of the chemical industry's pioneering Responsible Care program and its various elements is a very visible and significant manifestation of the degree to which these risk considerations have been internalized within the industry. The role of direct government intervention and enforcement in advancing this focus varies. In the US, for example, the evolution of tort law over the past 40 years has added a dimension to demands for product stewardship that has been relatively independent of specific regulatory controls. That has not been the case in most of Europe, in contrast, with the result that in the EU the formal regulatory structure (e.g. REACH) therefore plays a relatively larger role. In both these contexts, though, the potential contribution of the Green Chemistry Principles is to translate these more general concerns into specific considerations in chemical design and engineering. As with the environmental footprint elements, there are varying degrees of awareness and integration of these principles among corporations and other significant R&D institutions. The challenge is to broaden, deepen and accelerate attention to the following principles. • Design safer chemicals and products: Design chemical products to be fully effective, yet have little or no toxicity. • Design less hazardous chemical syntheses: Design syntheses to use and generate substances with little or no toxicity to humans and the environment. • Use safer solvents and reaction conditions: Avoid using solvents, separation agents, or other auxiliary chemicals. If these chemicals are necessary, use less harmful or dangerous chemicals. • Minimize the potential for accidents: Design chemicals and their forms (solid, liquid, or gas) to minimize the potential for chemical accidents including explosions, fires, and releases to the environment.</p> <p>CONCEPTUALIZING "GREEN CHEMISTRY" CHALLENGES: The UC Berkeley report on "Green Chemistry in California" implies a number of questions regarding the appropriateness and efficacy of current chemical practices and the larger regulatory framework within which those have evolved, particularly TSCA. It begins with expressions of concern over the volume and continued expansion of chemical production. That concern is misplaced. Chemicals are being used precisely because economic growth and well-being are being enabled by chemistry. Every chemical has unique properties. The challenge is to safely harness those properties in a way that adds value to the society. Importantly, many properties of chemicals that can be harnessed to benefit society can be hazardous and can create risk if they are not properly handled. Even chemicals with very low "hazard" can cause risk in certain conditions. The challenge of chemistry in the society is to harness the potential benefits associated with proper use of chemicals without inordinate risk. Green Chemistry is still aimed at harnessing this potential and delivering the benefits of unique chemical attributes. The difference is in giving more explicit consideration to possible lifecycle environmental and health risk in the design of chemicals and chemical products. The UC report does not focus on the Green Chemistry Principles, but rather on what it describes as systemic gaps in data, safety and technology. In essence, it seems to argue that these "gaps" are preventing the US and California from realizing the full potential of Green Chemistry – from applying the Green Chemistry Principles along the value chain. A useful starting point for discussion under the California Green Chemistry Initiative might therefore be to consider those allegations and explore specific questions that logically follow from them:</p> <p>Data Gap • Is there a "Data Gap"? TSCA Section 4, 5, 8 all funnel extensive data to EPA – is it used? Is it accessible where it needs to be accessible? ACC/ICCA HPV programs delivered base-set data across very broad range of high production volume "existing chemicals" – is it being used? Is it accessible? MSDS process is intended to provide basic guidance necessary to reduce risk – is it being used appropriately? Is it capturing necessary information? Is the information accessible (availability, language, etc.) where and when it is needed? • What is systemically missing? Where are the real opportunities to make a difference? • Safety Gap • Where is the Safety Gap? Chemical manufacturing safety is very high compared to other manufacturing and non-manufacturing environments – what is that telling us about the ability to handle chemicals safely? • Examples of problems often involve small businesses • OSHA gap? • MSDS gap? • What is systemically missing? Where are the real opportunities to make a difference? • Technology Gap • Is there a Technology Gap? Is the US in danger of falling behind EU and other countries reforming their chemical programs? • 12% of US patents – the chemical markets are in midst of a chemical industry evolutionary change – not clear that US is less adaptive • Chemical markets demanding "greener" products and "greener" outcomes • Chemical industry is responding to that market evolution • What is systemically missing? • Where are the real opportunities to make a difference?</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-5	It will be interesting to see if this is actually a forum for thought or just another mutual admiration gathering. I'm trying to think of something in my life that government doesn't regulate, tax, or restrict and I'm having trouble finding something. Maybe we could consider other approaches. The answer to every problem is not a law. At least it didn't used to be that way.
J-C2C-6	Some jurisdictions have the reputation of exporting their industrial wastes, such as by not allowing the basic industry to operate within the jurisdiction and only allowing the refined product to be imported. Is this California initiative going to be built on such a concept? I deal with electricity. I heard that California has told its electric companies not to buy coal power from outside the state. Perhaps someone doesn't understand the nature of electricity. So long as California is connected to a coal plant that is outside its border, some of the generation from that coal plant can be considered to be used in California, no matter what the contract says about where the electricity is coming from. Texas faced this problem forty to fifty years ago. Interconnections with power plants outside of Texas meant that the federal government was allowed to regulate bulk power sales in Texas. Texas got rid of that problem by disconnecting most of the state from the rest of the US, forming ERCOT (Electric Reliability Council of Texas.) ERCOT is similar to the California Independent System Operator (CalISO) except that FERC regulates CalISO and doesn't regulate ERCOT. If you are truly not just paying lip service to disavowing coal generation, then you need to disconnect from the rest of the US just as ERCOT did, or perhaps set up an electrical grid slightly larger than California that does not include any coal plants. Personally, I think that the interconnected grid has greatly lowered the cost of electricity and improved reliability and that severing California's ties with the rest of the US would be a bad thing. But it seems to be hypocritical to say California will not "buy" coal power when the physics of the grid results in coal power keeping the lights on in California. I am just wondering whether California will find a way to synchronize its rhetoric with the physics of electricity. Ah, politics and polemics. Mark Lively, P.E.
J-C2C-7	Mark Lively and Tom Jacob both raised the subject of products produced elsewhere. It does seem like we need to address the issue from a global perspective. It won't help much to become extra cautious in California when most of our chemical production is moving offshore to countries with fewer or perhaps no controls. In fact, since pollution is global we risk making the problem worse. If we tighten controls here we need to implement equally tight controls or restrictions on imports. Otherwise this effort won't mean much.
J-C2C-8	Can assure you that we anxiously await the arrival reasoned and responsible improvements in the materials we use to manufacture your furniture. Knowing what needs to be changed and not having viable alternatives is frustrating. Working with put your money in the black box C2C consultants is even more frustrating. Please make this work! You do your part, we'll do ours!
J-C2C-9	Gorge your right on. And the government usually makes laws and regs with tainted data.
J-C2C-10	By changing the process of development from chemically-based to an earth-friendly product will solve the problem only partially. Like previously mentioned by others, the chemicals have made life easier for mankind. Why not redesign products in such a manner than they can be reused for more than one purpose? This will result in less landfill waste and less energy trying to recycle. Now recycle is a big business. It should not be the case with this policy. I recently read an article that the process of making food wrap uses more energy and chemicals. Is there an alternative way to reuse the product more than once? Business do not want to develop products that can be reused for want of more revenue. This is where regulations help. More incentives should be provided to business that increase the life of a product and not just a use-and-throw product. Consumers should be educated to reuse. Unless business advertise it consumers do not want to think about it. Toys have been made to transform so the child sees more than one toy. Why not other products as well?
J-C2C-11	This all sounds good, however, let's think the processes through. From start to finish. and be realistic. Many greener approaches to saving the atmosphere have resulted in more toxic substances being used that affect the health of humans. ie: automotive paints and chemicals, and the recent MTBE problems contaminating the water supply. Be realistic in your approach, rather than idealistic and maybe things can get done.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-12	<p>Thank you for hosting the green chemistry symposium yesterday June 20, 2007. I learned a tremendous amount but have some questions, comments and potential solutions.</p> <p>1. I had the opportunity to visit Europe for the first time this spring. While there I read in the newspaper and watched on the BBC about the EU Reach initiative. Germany, while supporting the initiative had questions on the effects on its industry. Interestingly, the Germans referred to the US, England and other EU countries as "deindustrialized." They noted that Germany still derives 40% of its GDP from manufacturing while the others no longer include manufacturing in their top GDP generating businesses. I bring this up to note that they wish to preserve their industries and wished to evolve the standards to be workable. Some of the proposed green initiatives would simply put so many costs on industry that they will just move to China, India and other developing (rapidly industrializing) countries as many already have. Many of the green initiatives might have the effect of simply moving the manufacture and disposal of these products and their wastes overseas. Take for example the "recycling" of e-wastes and ship scrapping. The virtual outlawing of disposal of these wastes has simply moved the hazardous wastes to China, India and Indonesia where the activities are unregulated and the wastes are disposed directly to soil, rivers, air and into the bloodstream of child and abused laborers. http://www.ban.org/photogallery/index.html http://www.basel.int/index.html</p> <p>Constructive suggestion 1: Can any initiative, policy, or even regulation state that the companies manufacturing or subcontracting manufacturing, purchasing, or exporting products, materials, and wastes be held responsible for upholding those principles in all their business even if they occur in another country? If we can't then we are just moving the problem to our poorer neighbors. For example, many pesticides banned by our country by the EPA for sale in this country are still manufactured as one of our DTSC permitted facilities (Amvac) and sold overseas (see LA Times). CFCs are banned in this country but are still available in Mexico, last time I was down there.</p> <p>2. Is the testing of all chemicals before their release actually practical? My late friend Dr. Lou Levy (toxicologist) explained to me that studies for each chemical takes from 5-7 years and they are not always conclusive (like the recent perchlorate problem). Can there still be innovation or even an incentive to innovate if every chemical must run this gauntlet?</p> <p>Constructive Suggestion 2: Perhaps it would be better to prioritize the chemicals which we know now are being discharged in significant amounts and which are not being treated or survive such control systems as POTWs. For example, nitrates and pesticides from farm lands are creating dead zones with no life off the coast of Oregon, Louisiana, and other areas. Shouldn't this take precedence over a nanograms per liter of birth control drugs being discharged by POTWs, or are the risks comparative? When we look at the big picture we have the ocean and land being contaminated by hundreds of millions of tons of mercury from the burning of coal. This contaminates the ocean, our ocean fish protein sources, the entire ecological food chain and land throughout the world. Is this as big or a smaller problem than still suspected endocrine disruptors?</p> <p>Constructive Suggestion 3: I think we should enforce the laws we have before passing any new ones. While we are seeking to regulate very small amounts of some chemicals the City of San Diego still has an exemption to discharge "advanced primary treated" (sewage with the solids settled out with chlorine added) directly to the ocean. Ain't politics great! Hazardous facilities are still walking away from their waste sites because they are not required to fund their remedies until the entire site has been investigated. So companies just stall the investigation until they can go bankrupt. This happens because DTSC policy trumps the health and safety code law.</p> <p>Constructive Suggestion 4: Aren't there chemicals where the amount and type of treatment by drinking water purveyors and POTWs can be improved to simply destroy these contaminants. The manufacturer would have to be charged a surcharge to finance this advanced treatment.</p> <p>Constructive Suggestion 5: Since most of these "green chemicals and processes" have not yet been invented. Could a surcharge on the known to be hazardous or toxic materials be charged to finance INDUSTRY and academic research to create substitutes?</p> <p>Thank you for the opportunity to comment. Andy Cano</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-13	<p>Good evening. My name is Jeff Henderson and I own an international manufacturer's representative company called SPAP COMPANY LLC. SPAP is a hybrid, independent, international manufacturer's representative for SME California companies that:</p> <ol style="list-style-type: none"> 1. Make unique, highly-differentiated, preferably patented, medical, health, diagnostic, functional foods and beverages, green/sustainable chemicals, ingredients, materials and technological products that can be beneficial to people and our planet 2. Would like to have their products systematically promoted and marketed into foreign countries where their products have not yet penetrated 3. Have created products that can build new, green industrial bases for Californians seeking employment 4. Are looking to accelerate the return/shorten the time horizons to their investors from currently untapped overseas revenue streams 5. Have seasoned managerial capabilities in not just domestic, but international, markets 6. Are making "greentech" products or services that have applications in foreign countries 7. Are not internally staffed to systematically promote and market their unique line of products into foreign countries <p>To get a better idea about who I am and what my company does, can you please have a look at my articles, interviews and testimonials on my website link listed below. I have been looking for a California companies that are making unique and highly differentiated green chemistry products for export to foreign markets. Sometimes these companies are so small that they are off-radar so I am hoping that I can start to communicate with green chemistry bloggers about these type of California green chemistry manufacturers that are currently manufacturing in the Golden State. I am interested in talking to these types of companies for my overseas buying/import/distribution networks. Can you please e-mail at: skipperbuzzy@earthlink.net</p> <p>Thank you. Sincerely,</p>
J-C2C-14	<p>I believe people are aware of the Special Report by Michael Wilson (UC Berkeley) prepared for the California Senate Environmental Quality Committee in 2006 titled: Green Chemistry in California: A framework for Leadership in Chemical Policy innovation. It discusses the deficiencies in current US/state policy, therefore the chemical gap, the safety gap and the technology gap. It discusses what the European are doing with REACH. (which follows RoHs and WEEE).</p> <p>Several countries are trying to follow the European Union's REACH type legislation to better manage the risks of "man-made" chemicals and use. If anyone would like a copy of this article which I got from the author, please let me know.</p> <p>Nilmini Silva-Send nsilvasend@haleyaldrich.com</p>
J-C2C-15	<p>Before California wastes any time on this initiative, I would become fully aware of what the EPA is doing with their Design for Environment program. Its full implementation is well thought out and makes any work by California unnecessary. The last thing formulators need is another California standard different from EPA standards. The VOC standards are complex enough and Green standards from California will make the complexity even greater.</p> <p>Tom Forsythe</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-16	<p>YES!!! Let's get started. The combination of green chemistry, green engineering, and biomimicry, biology is transformational and will enable us to create the future. This is beyond filling in gaps and removing toxics, although it will address those areas when applied.</p> <p>The vision and overall strategy are key to keeping the entire effort focused. Also, there are many systems that already lend themselves to the creation and growth of green chemistry, such as Total Quality Management, i.e., cradle to cradle, with the quality aspect being sustainability in this case. Start to finish with methods to measure and quantify environmental and financial impact.</p> <p>While the overall plan is needed, it helps to concurrently work with a model or prototype. As this progresses, it will reveal more and more detail, thus adding experience and substance to the overall plan implementation.</p> <p>I'm planning on being in Sacramento for the public forum on Wednesday, June 27. I hope to meet many of you there and establish the beginning of relationships that lead to significant momentum for a focused and well-coordinated Green Chemistry Initiative in CA. Hopefully, this will spread rapidly beyond CA.</p> <p>Sandy McDonald CEO, Managing Partner, GreenHouse Partners An early stage startup focused on rapid commercialization of green technologies and green chemistry. MS Degree, Polymer Science, BS Degree, Chemistry email: samcdonald27@aol.com</p>
J-C2C-17	<p>If California installs Plasma Reactors at waste managements site. We would be looking pretty good. There intense heat dissolves everthing except nuclear waste. The energy the the Plasma Reactors creates powers itself and has left over for the grid. The by product is a synthetic gas that can be converted to hydrogen.</p> <p>Good luck</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-18	<p>The Silicon Valley Leadership Group, which represents 210 employers in Silicon Valley, would like to offer our perspectives mainly as that of chemical end-users, especially in respect to R&D efforts that often use small quantities of tightly managed chemicals to drive technology breakthroughs. We propose the following ideas under this topic:</p> <ul style="list-style-type: none"> • Consumer Education: Well-informed consumers will not only handle and dispose of chemicals more safely, they will demand safer products with closed loop lifecycles. We need to expand consumer education regarding product life cycle costs and impacts (e.g. appropriate selection, use, disposal, and alternative materials or practices). Disseminating information could occur through traditional media as well as outreach through community partners as well as the private sector. Employers are happy to share good information with their employees. o Improve the quality of communication between all stakeholders (regulatory agencies, industry manufacturers and users, and the public) by educating how chemicals are created, screened for use, and managed through a process. Show people “a day in the life of a chemical.” o Improve transparency and public disclosure, while being mindful of intellectual property and trade information. Provide complete chemical risk information in a way the public can access, understand, and absorb. Create convenient, credible chemical evaluation tools that businesses, schools or individuals can easily use when selecting chemical products. Pfizer’s Solvent Alternatives Chart listing three columns of encouraged or discouraged chemicals for internal use is a stellar example that should be replicated. ? Show examples of the risk as well as the hazard. Define as high, medium and low and compare to products and services used by consumers everyday. If something is a hazard, show the alternatives or how the risk relates to§ the pathways for exposure (Is it in a product, or solely for use in a process? If it’s in a product, what entails safe use? etc.) Labels, while well-meaning and accessible, can be confusing, vague, and§ desensitizing. Due to global distribution chains which make it difficult to single out specific labeling just for one state such as California, labeling should be used with restraint. o Enable and streamline disposal of household hazardous waste (curbside pick-up or more local collection centers.) Improve the publicity of and accessibility to this disposal. Also educate on the safety measures used around disposal centers, because community backlash toward collection points is probable. • Study and disseminate information on the cost of waste. Educate that one user’s waste is another’s food.
J-C2C-19	<p>There appears to be a complete disregard for TSCA (not perfect, but an amazingly powerful 30 year old FEDERAL program for addressing many of the issues of concern here). I hear people saying that they don't know which chemicals are produced in the state and how much. That information exists. Manufacturers are subject to TSCA and submit Form U's during the reporting cycle. EPA compiles the information and there isn't any reason that the information cannot be broken out by state to establish priorities.</p> <p>There is already an enormous body of information available that took years to generate, and it would be foolish and shortsighted to ignore that data in favor of a system (i.e., REACH) that is, as of yet, unproven. REACH hasn't been implemented: no data has been collected/submitted/analyzed, and the rush to throw out everything generated to date in favor of something we haven't even seen work is frightening.</p> <p>It is critical that thoughtful consideration be given to the overall process.</p>
J-C2C-20	<p>My name is Steve Levine and I am the founder of Excellent Packaging & Supply. We distribute a comprehensive line of biobased foodservice packaging. I would consider these products to be the result of green chemistry because you are combining sustainable products to replace Old Carbon (fossil) feed sources. The utilization of agricultural waste materials to replace petroleum feed stocks is green chemistry that is a vital part of arriving at the solution to our waste stream issues. Local production of packaging used locally and then composted.</p> <p>The most efficient carbon footprint is one that does not travel. We must work together to create the infrastructure which will move us away from such total reliance on Fossil Fuels.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-21	<p>I have read with interest the various comments above and enjoyed participating in the June 27th workshop. I am a bit disappointed by the degree of cynicism expressed on this Blog, though I certainly respect highlighting issues and constructive suggestions on things to watch out for in order to ensure that our efforts in Calif are worthwhile and beneficial. There are many thoughts that came to mind as I read through these various comments. Here are my initial perspectives on a few of the issues that have been brought up:</p> <p>1) Chemical industry's innovation—we applaud programs within the chemical and other industries that reduce toxicity, waste, and expended energy in products and processes. However, the reality is that our homes are still filled with toxic materials, our neighborhoods and workers are exposed to toxic industrial contaminants, our waterways and air are polluted, scientific research continues to demonstrate that environmental toxins are tied to serious health and environmental degradation, and the costs of addressing these problems are skyrocketing. This requires major change in our production models, how we grow our economy, and how we define what is safe or acceptable.</p> <p>2. Chemicals are beneficial--I don't think anyone would argue that the use of chemicals has brought many benefits to society. That said, I would argue that when a chemical is toxic to people, animals, or the environment, its benefits are to a significant degree reduced. Not recognizing this is like saying we will give a patient medicine that will kill a disease, but will also kill (or hurt in some way) the patient. The challenge for us is to rethink how we view benefits and how we make products. In other words, we need to add safety/non-toxicity to the mix of benefits and goals that are considered when we develop products and the chemicals of which they are made--and place them on an equal footing with the other benefits. I believe we also need to weigh benefits realistically; something we don't always do. One of the examples alluded to above was the advantages of plastic. Plastic doesn't break as easily as glass, so is considered safer. However, I would respectfully argue that the potential harm to society as a whole from getting cut by broken glass is minimal compared to the toxic issues related with ubiquitous exposure to plastic products and their environmental impacts. No doubt we could find examples of tragedies from the use of both glass and plastics and I am not suggesting that we do away with plastic. I am simply saying that we must consider benefits with health and safety in mind, as well as the numbers of people or being impacted by one of the other and the breadth of the environmental effects.</p> <p>3.) Chemical industry is largely outside of Calif.-- this is true and something we have to work through as we make decisions here. There is no reason for the state not to act however. Perhaps even more importantly, it would be foolish for our industries, even those that outsource their manufacturing, not to develop alternative means of production based on green chemistry principles given the reality of greater global regulation, the costs of managing toxic chemicals, the costs of worker illnesses/injuries, the costs of environmental clean up, and the growing awareness of investors/fiduciaries about these issues. As a resident of Silicon Valley, I would certainly hope that our local corporate leaders will consider these external forces as they continue to innovate in order to protect and strengthen our local economy.</p> <p>4) Need for incentives--My organization (Clean Water Action) is very interested in exploring the ways the state and communities can help foster green chemistry innovation in California, including incentives. That said, I have not yet heard what those incentives should be, despite a recent research project where we interviewed stakeholders from a wide variety of constituencies, including industry. My own experience working in industry is that our business community is often the most creative part of our society, and that companies that will continue to grow and succeed are those who innovate when they see an avenue to gain a competitive advantage. If companies don't respond to the realities I've mentioned above, where will they be in the future?</p> <p>5) Regulation--Let me be upfront about this. In the interviews I've already mentioned, the one thing I did hear consistently, including from a number of those representing industries, was that money and regulation were in reality what drive companies to change. Voluntary programs were viewed in general with a jaundiced eye and not deemed as usually successful. As an organization we certainly don't want to create regulations that are not well thought out and of little use; nor do we want to create rules that just lead to further problems (like the MTBE issue). But, we and our 20,000 Calif. members do believe that regulation will play an important role in moving toward a less toxic economic model. Fortunately, we also believe that such a model will create competitive advantages for our businesses.</p> <p>6) The Data Gap--Despite regs like TSCA and other programs, we do not have adequate information on how chemicals we use impact human health or the environment,</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
	<p>how they are being used, where and in what amounts they are being used, etc. This is certainly true for the public at large, but I think what is even more problematic is that end-user industries that use chemicals or parts with chemicals in them have limited knowledge what they are using or what the alternatives are. The information up and down the supply chain is weak or non-existent and we believe this is one of the first things that needs to be rectified. To do that, we need the information to be gathered on chemicals from the very start, which is why we support regulations that will require health and use information for high volume production chemicals being used or imported into California.</p> <p>Sorry to be long winded. We certainly appreciate this forum to sound out our various perspectives and look forward to getting into more specific actions and strategies to move forward.</p> <p>Andria Ventura, Clean Water Action</p>
J-C2C-22	<p>Hello,</p> <p>The post from Mr. Tom Jacob – DuPont, Sacramento, is one that should be read carefully. It is a great post. It is respectful, factual, and opens the door to a robust and objective discussion. It separates the reality of the change management process from the uncertain promise of increased jobs, wealth, health, etc.</p> <p>I wish I could write as well. What I have to say will sound 'preachy' in comparison. All I can ask is forgiveness, because this is not my intent.</p> <p>The Green Chemistry initiative involves one of the largest scales of change possible- change of the behaviors of an entire society. A good analogy to keep in mind is whether the governor of any State can mandate that all of the citizens look, act, and feel a certain way. It is not possible to shift a society without a huge cost and prolonged period of time. Nothing significant is going to happen in 2 years. Nothing significant is going to happen in 2 years. My guess is that this is a 'hundred year' change and will occur incrementally, with about 10% of the change state realized each decade.</p> <p>Mr. Jacob raises a very important issue that is foundational to change management- what are the specific gaps relative to the envisaged end state. Note that the end state must be clearly defined. Less toxic chemicals = more wealth and health is not an end state, it is simply the hope of a benefit. Hope is good, but one must be able to describe exactly the result desired. The desired state can then be compared to the current state and there can then be a frank discussion about the approaches to closing the gaps.</p> <p>Effective gap analysis is not the most critical change management issue, however. The most critical issue is not even defining/designing the "Green Chemistry" state. The most critical issue is the readiness of the organization (society) for the change.</p> <p>A lot of work needs to be done before consumers create enough market force to shift entire value chains. It can happen, and we can find evidence in 'green' markets and products today, but it is non-optional. This change must happen for the hope of greater wealth and health to turn into reality. History is littered with industrial changes that went bust because the consumer could care less. This is a key point. If consumers could care less, other products will fill the gap. Concerns are not unfounded relative to lower-quality products from lower-cost geographies sweeping in and decimating California industry. It is a law of business. You cannot add value that a consumer will not pay for and expect to survive for very long.</p> <p>A key change that has to take place rests with consumer attitudes and habits. The pioneering work of eco-psychology relatively to creating a fertile demand (market) environment is a critical construct. It is, after all, a system, and the system has to be well understood before it can be changed from within.</p> <p>There is an opposing side and therefore “roundness” to everything in the scale of human experience: life to death, good versus bad, even the earth, the seasons, the day, time, etc. It all depends on balance. Why do I say this? Because I want to stress that any approach that seeks to influence just a part of the system cannot succeed in a societal system bounded by the laws of human nature and ecosystems.</p> <p>Control death and what do you get? Control industry instead of consumers and what do you get? No output is an accident. Every output is the exact result of the system inputs and how the system works to change the inputs into outputs at each level. The output can be either something valued by others, something needed to make the organism run (and is consumed in the running), or waste.</p> <p>Regulators regulate industry, not society. The Green Chemistry initiative runs the risk of being only a half of a solution and therefore suboptimal. In this respect its</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
	<p>potential success is highly questionable.</p> <p>Effective change management requires understanding the desired output, the transformation processes that lead to it, and the inputs into every major level of the organization (society) and the transformation processes. Inputs occur in the context of the environment enveloping the whole system. Culture is the biggest pro and con issue for the society and each major element of the system. Culture eats change for lunch.</p> <p>Should we, as a society, lead something so broad out of an Agency which has a culture of regulation? When push comes to shove, the culture is very likely to resort to emergency regulations in order to make a point, meet a deadline, patch a perceived gap, or just because "it's what we do." To be fair, the same "fallback" potential exists at every level. This is why change takes so long- it takes a long time to overcome the habits that cause people to retreat to what has worked in the past rather than take the harder path forward. If you do what you have always done you will get what you have always got.</p> <p>One of the last truly important considerations I can offer here is that no change happens without an initial drain in resources, decline in performance etc. No change happens without an initial drain in resources, decline in performance, etc. Society must be willing to make the investment and stay the course. In a change this profound, there will be a prolonged period of investment and pain, even temporary declines in performance. The vision of greater wealth and health is not a given. It takes a lot of investment in time, energy, capital, and the experience of unfortunate mistakes to move forward.</p> <p>The MTBE failure in California is a classic example. It is also an example of why this average citizen is not entirely convinced that driving this from a regulatory perspective is the best approach. The MTBE case is a classic example of one agency (The Air Board) mandating a "good change" that ultimately turned out to be a very bad change in another area (The Water Board). Some will say that is exactly the sort of issue the Green Chemistry initiative will prevent. Perhaps, but I suspect that even if the initiative existed at the point the Air Board acted, MTBE likely would have been pushed through for its potential clean air benefits.</p> <p>Apparently no one in a position of power came to know that fiberglass was permeable to MTBE. The issue was not the chemical per se, but the intersection of many different circumstances, none of which is likely to have halted progress in an of itself before all of them came together in the field and triggered the first incidences of the chemical turning up in environmental media samples. As it was, I think the U.S.G.S. sounded the alarm early, when they started seeing MTBE in water samples from across the country, but it took years for the Agencies to act. This is exactly what I mean when I say "culture eats change for lunch."</p> <p>The key is to change the inputs that create perverse, counterproductive, and barrier behaviors. How could the system have been changed to create an MTBE scenario concerned with net environmental impact instead of air impact? This is a relatively easy question compared to the "what if" questions that surround a subject as broad as shifting society away from the use of synthetic "high risk" chemicals. These are not easy questions. The inputs occur at every level and step of the societal processes. It will take years to build the necessary understanding and linkages to begin the organizational change design, let alone the decades it will take to implement it, and then more decades to see an appreciable response in the environment.</p> <p>Should we give up? Absolutely not! We must not retreat, but we have to beware of falling back to old approaches and "five-year plan deadlines" in the face of a huge and complex issue. People must be wary of the "easy fix" of asking the agencies to declare the bad chemicals and force manufacturers to stop using them. We have to tackle the whole problem for the sake of the future. Piecemeal solutions won't work, because the issue is too comprehensive. Everything under an umbrella this big is interrelated.</p> <p>If a neutral forum can be established to bring together thought leaders from every aspect of society (industrial, financial, health, civil, etc.), I think it might be possible to set a goal for a comprehensive change management design and plan by 2012. I imagine this will yield change management experiments that will take place over another ten years, with concurrent shifts to the green chemistry principles. With appropriate feedback loops, design improvement and substantial change implementation can be underway by 2020 or so.</p> <p>What realistic goals would we want to see going into the process?</p> <p>Thank you for allowing me the opportunity to comment.</p> <p>regards, Michael Cox</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
	New Almaden, CA
J-C2C-23	<p>I just completed a review of the new blog and felt compelled to add my two-cents, however simple the language and scope. I believe the Green Chemistry Initiative to be our one, best chance to reveal the true environmental impact of our society's manufacturing processes and building practices in California. As importantly, the effect to today's occupational and public health concerns. We will not be able to advance solutions to these issues if not also engaged in the collective fostering of innovations in product design and subsequent support of their use.</p> <p>The organizations that I represent are challenged with the development and promotion of but a few alternative technologies that generate a tremendous impact in the parallel course of sustainability & human health. We have found risks to success most associated with grandfathered interests, not the science that backs up the application of the technology, or realized cost savings to the user.</p> <p>We will continue our efforts, and greatly appreciate yours as well....</p> <p>Nick Sleeth</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-24	<p>Dear Director Gorsen:</p> <p>I recently reviewed "Sustainability in the Chemical Industry," a National Research Council of the National Academies report. Appendix E of this publication contains a diverse suite of options that I recommend you consider for the Green Chemistry Initiative. The authors of this study have provided an outline of challenges and possible solutions that may be useful in guiding the Green Chemistry Initiative.</p> <p>Recognizing the need for serious scholarship concerning the challenges and research issues related to infusing sustainability into the chemical industry, a wide spectrum of experts and supporting organizations were involved in the study. Some of the fields represented are: chemistry, agricultural chemicals, petrochemicals, pharmaceuticals, industrial research management, business strategy and innovation, and environmental health and safety. The report's sponsor included the American Chemical Society, US EPA, Los Alamos National Laboratory (US Department of Energy), the National Science Foundation and the American Institute of Chemical Engineering.</p> <p>I am enthusiastic about the value of "Sustainability in the Chemical Industry" and I encourage you to consider this report in the process of developing a list of policy options.</p> <p>For your reference, you may view Appendix E through the following link: http://books.nap.edu/openbook.php?record_id=11437&page=156</p> <p>Respectfully submitted, Merob Shimeles, DTSC 2006-2007 Executive Fellow</p>
J-C2C-25	<p>I had neglected to mention - one of our emerging tech products is an alternative to traditional building insulation. A cradle-to-cradle product that is manufactured at a zero-waste facility. Forgive me, Nick...</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-26	<p>Existing Chemicals:</p> <p>1. What if California required all chemical manufacturers and importers of chemicals, regulated by TSCA, to have a baseline toxicity and eco-toxicity data included on their Material Safety Data Sheet (MSDS) in Sections 11 and 12 as listed below?</p> <p>Section 11 (toxicological information)</p> <p>Oral LD50 Skin LD50 Eye Irrigation Data Inhalation LC50</p> <p>Section 12 (ecological information)</p> <p>96 hour LC50 fathead minnow 96 hour LC50 bluegill 96 hour EC50 water flea</p> <p>2. In addition to the above, what if data on toxicity endpoints, such as neurotoxicity, endocrine disruption etc. were required to be included?</p> <p>New Chemicals:</p> <p>3. What if TSCA required all new chemicals to have the above mentioned baseline toxicity and eco-toxicity data on the Pre-manufacture Notification (PMN) form? The goal is to identify substances of hazardous properties and to evaluate the risks of human and environmental exposure.</p> <p>4. What mechanisms could we use to collect information on chemical use in California? Information about chemicals in products?</p> <p>Potential Information Categories</p> <p>5. What factors has your business taken into account (i.e market, environmental need, external, internal stimuli to develop, etc) to develop and/or manufacture the commodities, products, and/or processes that your business provides? (Please identify the industry type and describe the processes)</p> <p>6. What was learned during the development of commodities, products, processes that you would recommend to avoid and/or to apply to the development of new Cradle to Cradle (C2C) products or processes.?</p> <p>7. What successes and/or failures i.e. business, environmental perspectives, etc. of these C2C commodities/products, processes would you recommend to avoid or practice?</p> <p>8. What areas in your business and/or organization’s would you explore new innovative possibilities for novel and potentially market successful and environmentally compatible C2C projects?</p> <p>9. What is the most effective process to ensure there is future increased emphasis on products that can be characterized with C2C in their preparation, manufacture, distribution, disposal?</p> <p>10. What if legislation mandated take back programs for specified products and commodities?</p> <p>11. How should California measure the movement towards a Green Chemical Economy?</p> <p>12. What if, California required establishment of initial “Green Metrics”? What rate of change will be considered “significant”? Who should measure the rate of change?</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
	<p>13. Should there be unique C2C standards for common businesses that do similar activities, such as oil refining, polymer syntheses, computer chip manufacturing, agriculture? How will they be defined? Who will define them? If defined, who will monitor/assess their practice?</p> <p>14. How can California and the US EPA synergize their efforts to move to a Green Chemical Economy?</p> <p>15. Are there economic strategies to address the possible more costly greening of preparation, manufacture, distribution, disposal? Who should bear them (if more costly)? Who decides who should bear them?</p> <p>16. Are there reasons why we should or shouldn't adopt the Canadian Lists for the list of chemicals requiring information submittal, such as differences in volume or the types of industrial chemicals used in California?</p> <p>17. Is there a rationale for having a different system for existing and new chemicals and products? What is the rationale? What should the differences be and why?</p> <p>18. Are there reasons why we should or shouldn't adopt REACH? If we don't choose to adopt REACH in its entirety, are there aspects that make sense for California?</p> <p>19. Should a Green Chemistry process be phased in over time and how might the phases be prioritized and structured?</p> <p>20. What if California adopted a chemical use policy that augmented the federal Hazardous Substance Act of 1960 by 1) amending the definition of products; 2) requiring labeling similar to the Federal Nutrition Labeling & Education Act of 1990, that requires disclosure of chemical information in products and commodities to educate the public about the chemicals and the health hazards and/or implications of their use?</p> <p>21. What process should be considered to make decisions on chemicals where there is incomplete toxicological information, such as carcinogenicity and mutagenicity?</p> <p>22. How should the public obtain information about chemicals in products? Should product labeling be required? Should there be a database containing toxicological data that is available to the public?</p> <p>23. What should the decision process be to determine which chemicals should be modified to be less toxic or to determine if there are available substitutes?</p> <p>24. How should economic costs be factored into decision making? Are there methods to monetize the costs and benefits of new processes? If so, what are they?</p> <p>25. Do we need to establish priorities for the review of existing chemicals and what information do we need to establish priorities?</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
J-C2C-27	<p>The Green Chemistry Initiative held a public stakeholder meeting on August 17th in San Jose. The goal of this meeting was to gather input that will provide recommendations for developing a consistent means for evaluating risk, reducing exposure, encouraging less-toxic industrial processes and identifying safer alternatives. The comments below were received as a direct result of the breakout session on cradle to cradle. If you have any thoughts or suggestions on the ideas shown below, please respond and share your views.</p> <ul style="list-style-type: none"> • Involve other agencies, e.g. DHS. • Rethink the processes for allowing chemicals into the market. • Educating the companies and consumers world-wide. • Enforcement. • Fines for non-compliance. • Non-compulsory good manufacturing practices (GMP) for products. • Responsible producer management at end-of-life. • Teach green chemistry and green design at schools. • Define cradle to cradle? • What is the real objective? • Expand information on toxicity and use. • Leverage information to make better decisions. • Using CUPA's to put more information out. • Hazard, risk and exposure should be more available. Difference of opinion on how the information is to be used to make decisions. • Life cycle analysis. • Focus on review and regulate products. • Data on products/chemistry. • Incentives-need information on good/bad. • Financial (Green Building) responsibility. • Light bulb example disposal. • California should take lead. • Waste=food (nutrient). • Transparency of product contents. • Give consumers an informed choice. • Give retailers an informed choice (all the way up chain). • Address the need of person asking for information. • Seek alternative processes and designs. • Advance the discipline life cycle analysis include education and training. • Manufacture responsible for testing and hazard analysis. Consider manufacture liability. • Educate early in education process. • Include GC education in curriculum ie UC environmental ethics. • Design with intent of EOL <p>*Take back</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

CRADLE TO CRADLE (JOURNAL)	
Number	Full Comment
	<p>*Producer responsibility with idea of economic change of design *Facilitate COUGE recycling *Design to be biodegradable Design to last</p> <ul style="list-style-type: none"> • Look at what currently doing for baseline for products and what's in environment. • System needed for imports. • Figure out how to deal with priority labeling for personal care products and cleaning products. • Celebrate achievements in sustainability (products + business models) eg. EPA Awards (communicate achievements + challenges) • Provide more/enough research to evaluate alternatives meaningfully. • Look to past, find information that is already out there. • Business model that captures components-anticipates the end of product use. • Enable tools + infrastructure for reuse/refurbishing/recycling + tracking. Thinking about waste and secondary products. • Tools to help conserve chemicals-especially end users. "Reward end pointers, not inputs". • Policy for maintaining + tracking mass balance. • Share innovative business models/stories. • Product reuse opportunities. • Disincentives cost of disposal. • Incentives to use different products and components. • Create pricing signals. • Green marketing. • Producer recovery responsibility. • Focus on feed stocks petroleum. • Establish a goal ex LEED standards lb. goal should be zero. • Changing existing standards to allow for a zero waste framework. • Remove barriers (regulatory and social) to technological innovation. • Tax waste. • Broad implementation of EPP. • Alternatives Analysis. • Environmental Footprint Metrics.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-1	<p>Maureen, et al. -</p> <p>Per your request, I am sending this to let you know my initial comments on your Green Chemistry Initiative. I am encouraged by what I've learned so far. You have identified an important issue, framed it in a way that acknowledges the opportunities and challenges, appear willing to foster and consider creative solutions, and have established a process for building broad-based support for your efforts.</p> <p>As I mentioned when I discussed this with you previously, I think that the greatest challenge will be making decisions giving a lack of scientific certainty. When it comes to these chemicals and their possible replacements, we often lack the most fundamental information needed to make good decisions. I suggest that you add "decision-making given scientific uncertainty" to your list of challenges.</p> <p>This scientific uncertainty issue points to a second challenge that should be added to your list: How to fill data gaps as quickly as possible in order to make reasonable decisions. We don't want to be a deer in the headlights and we don't want MTBE-type solutions to our chemical policy problems. We need to find the right balance but we also need to maximize the knowledge we possess so that we maximize our changes of making good decisions.</p> <p>I think that the first step in addressing that challenge will be to assure that all agencies take full advantage of the statutory authority established under AB 289 (Chan, 2006). DTSC and others must start requesting chemical data using the provisions established under AB 289.</p> <p>At minimum, decision-makers will need to know how to measure a chemical and its byproducts in the environment and all there is to know about the toxicity of those chemicals and byproducts. With regard to toxicity, agencies need data on all toxicological endpoints, including cancer, reproductive effects, developmental toxicity, genetic toxicity, neurotoxicity, immunotoxicity, endocrine disruption, and respiratory toxicity. It is frightening to think that we make decisions everyday about the use and handling of potentially toxic chemicals without knowing the first thing about most, if not all, of these toxicological endpoints.</p> <p>Also with regard to possible solutions, I suggest that you carefully consider "alternatives analysis" as a superior approach to making chemical policy decisions. This decision-making approach is explained in Making Better Environmental Decisions by Mary O'Brien (2000, MIT Press). This book should be a must read for all of those engaged in this Green Chemistry Initiative.</p> <p>Finally, I would hope that you would consider taking the extra effort necessary to assure that this initiative benefit from the active involvement of representatives from our most polluted communities. This means having to educate community members about this process and provide them with ongoing opportunities for meaningful involvement in the decisions you make. Please do not have all of your meetings in Sacramento. Have them in Barrio Logan, Wilmington, Maywood, Commerce, Huntington Park, South Los Angeles, Del Amo, Pacoima, Riverside, Mira Loma, East Palo Alto, West Oakland, Midway Village, Bayview Hunters Point, Richmond, and other places where people have spoken out against environmental injustice. Grounding your discussions in the needs of these impacted communities will only serve to improve the outcome of this process. In the end, we will measure the success of your efforts not only in terms of policy outcomes but also in terms of community involvement and support.</p> <p>Thank you for considering my comments.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
	<p>Joe ***** Joseph K. Lyou, Ph.D. California Environmental Rights Alliance www.EnviroRights.org *****</p>
J-GC-2	<p>In line with the approach taken in Mass., DTSC, and Cal/EPA ought to strongly consider forming a partnership with the UC. In Mass., the Lowell Institute at the U of Mass was established to collaborate with industry, and to conduct research on "green" alternatives, and sustainable manufacturing. This was very successful. The sheer number and complexity of businesses in California precludes Cal/EPA and DTSC from doing anything meaningful on their own; it would require a huge number of staff and resources. A research institution with the clout and resources of the UC should be tapped for assistance. I suggest partnering with the UC to create an institute for sustainable manufacturing and green chemistry research. "Planning is most effective when its practiced in advance"-William McDonough</p> <p>Robert J. Brushia Senior Scientist California Environmental Protection Agency's Department of Toxic Substances Control Hazardous Waste Management Program Regulatory and Programs Development Division</p>
J-GC-3	<p>Dear Colleagues, The UC report, Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation, points to the problems of the Data, Safety, and Technology Gaps that have emerged in the chemical production system in the U.S. and in California. These Gaps are a consequence of weaknesses in chemicals policy, particularly with respect to the federal Toxic Substances Control Act. Actions taken by DTSC as part of the Green Chemistry Initiative should focus on correcting these Gaps. Measures that do not address these Gaps might provide incremental benefit in certain industries but will not correct the underlying structural problems in the chemicals market that are occurring as a result of these Gaps. Correcting these Gaps will steadily improve investment in green chemistry in California by improving the flow of information in the chemicals market, improving regulatory oversight, and introducing additional incentives to motivate entrepreneurial activity in green chemistry science and technology.</p> <p>The UC report does not directly address the role of the University of California in helping the state implement a modern, comprehensive chemicals policy. There is clearly a vital role for the University, however, in an array of green chemistry issues, from economic and policy matters to technical aspects of chemical design, production, and technology diffusion. In preparing the report over a period of two years, we identified an enormous need in California for a University-based entity that is able to employ the resources of the University to the problems in the chemical production system, and in the chemical market and its regulatory oversight. I propose that the Green Chemistry Initiative include a component dedicated to improving the capacity of the University of California to engage effectively with the chemicals policy and technology issues in California. The UC Berkeley and UCLA campuses are the natural locations for locating this work. Berkeley and UCLA have the capacity and stature to provide continuing intellectual leadership in this arena and to steadily increase the number of campuses involved in supporting the Green Chemistry Initiative.</p> <p>The Center for Occupational and Environmental Health (COEH) at Berkeley and UCLA are the natural homes for this work. COEH has a 25-year record of outstanding service to public and environmental health in California, and it is a multi-campus, multi-disciplinary entity that is capable of grappling with the multi-dimensional</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
	<p>problems inherent in chemicals policy and in the Green Chemistry Initiative. The COEH green chemistry report produced for the California Legislature is testimony to COEH's expertise and commitment to excellence in this arena. COEH has sites at Berkeley, Davis, San Francisco, Irvine, and UCLA. Additional campuses, such as UC Merced, can be brought on-line with COEH to address specific topic areas, such as toxics in plastics, or the economic viability of bioplastics in California, for example. Merced and other campuses, however, are not able to provide overarching leadership within the UC system that will be essential for a robust Green Chemistry Initiative by Cal/EPA. Proper placement of the Initiative within UC is critical at this juncture. Please let me know if I or others at Berkeley and UCLA can be of assistance to you in this aspect of the Initiative.</p> <p>Finally, congratulations on outstanding leadership, for placing California on the forefront of chemicals policy reform and green chemistry innovation in the U.S.!</p> <p>Respectfully submitted, Michael P. Wilson, Ph.D, MPH Assistant Research Scientist Center for Occupational and Environmental Health School of Public Health University of California, Berkeley</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-4	<p>Dear Director Gorsen,</p> <p>I understand that you are soliciting suggestions for your green chemistry initiative.</p> <p>First, I applaud you for starting a discussion about a proactive step toward reducing the use and release of toxic substances in our environments. The tools and approaches now in use are too piecemeal and not producing fundamental solutions.</p> <p>Second, an initial challenge will be to develop an initiative that is reality-based. At present, there is little actual practice of "green chemistry" as that term is defined. What would be the drivers that would cause the designers and manufacturers of chemicals currently in use to redesign them? This is an important public policy challenge, as those who have invested in the status quo are not necessarily most likely to seek to change it. In addition, how to design materials to avoid threats to health and the environment is still a research question, so an effective strategy will need to bridge the considerable distance between where we are now and where you want to go.</p> <p>Third, I believe that it is important to understand that there are many potential decision makers who can and will influence what chemicals are used and released into the environment. These include every consumer who decides what kind of soap to buy and whether to use baits or traps for pests. This includes every company that purchases products for use in their business. It includes every entity that selects materials to use in manufacturing their own products. The information needs of these entities are diverse, but finding ways to help all of these entities distinguish between the more toxic and the less toxic alternative is a critically important need. This does not seem to be reflected in the current description of the initiative, which focuses more on what Cal EPA will do. Cal EPA can do a lot but not everything.</p> <p>Finally, the question of how to generate the data stream needed for unbiased assessment of the relative toxicity of various compounds (as well as processes and other types of things contemplated) needs serious attention. None of the chemicals policy initiatives have solved this problem. They are mostly relying on the kinds of testing approaches that have been in use for the last 30 years, focused on only some of the toxic effects that are of concern. It is essential to be able to accurately distinguish those compounds that are more toxic from those that are less toxic for "green chemistry," toxics use reduction, substitution or any of these kinds of approaches to lead to better decisions. We need to get serious about using the new knowledge and methods that have been generated in the last 30 years to do something smarter and better than what has been done in the past. We also need to recognize that even the kinds of data that we have had in the past is not being generated very much in the US any more. These issues need to be addressed with genuine expertise and commitment to the public interest, to avoid potential having well intended initiatives become another form of green-washing.</p> <p>Thank you for your leadership.</p> <p>cheers adk Amy D. Kyle, PhD MPH Associate Research Scientist and Lecturer Project on Science and Policy for Health and Environment School of Public Health, University of California, Berkeley</p>
J-GC-5	<p>I thank you for the opportunity to comment on the Green Chemistry Initiative.</p> <p>I am not an environmentalist, but rather a chemist, consulting for an international trade organization, the Perlite Institute. In the past, several specific chemical topics have gotten me excited as possible replacements for toxic or somewhat toxic materials. These include geopolymers and ionic liquids (low melting temperature salt compositions that can replace organic solvents in industry),</p> <p>More recently, the California Air Resources Board determined that soil fumigants should be regulated as smog-forming compounds, and may require farmers to cut back use of these chemicals. Perlite, as supplied, is a sterile plant growing medium, and has potential use to fully utilize farm acreage. Perlite also holds water near plant roots, enabling better usage of irrigation water.</p> <p>Thank you for supporting research into environmental issues.</p> <p>Ken Wiener, MS</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-6	<p>Several years ago, CAL-EPA worked with UC Davis as I recall, to create a California Chemical List of Lists which allowed manufacturers to view chemical ingredients with restrictions. Where did it go? Discontinued due to lack of funds?</p> <p>Also, if CARB VOC definitions were the same as local SCAQMD definitions, then manufacturers might not get as confused when trying to develop compliant green products for the California market.</p> <p>Rob Johnson Industry Environmental Specialist</p>
J-GC-7	<p>Posted from an email sent by Thomas W. Oakes, PhD.</p> <p>Following is what we see as needed to create energy with no harmful chemistry to California.</p> <p>If you can use this approach please include us as participants.</p> <ol style="list-style-type: none"> 1. Make electrical energy by using on-site direct photoelectrochemical hydrogen generation. This process employs only solar energy to chemically splitting water deriving hydrogen. 2. Hydrogen may be used in fuel cells to generate pollution free energy. 3. Hydrogen may be burned in ovens, furnaces, generators, and vehicles without producing any pollution to the environment. <p>Thomas W. Oakes, PhD Solar Hydrogen Co</p>
J-GC-8	<p>The new European chemicals legislation REACH (Registration, Evaluation, Authorization and restrictions of Chemicals) should be a model for California to review, Their website is http://ec.europa.eu/echa/home_en.html</p>
J-GC-9	<p>Hi,</p> <p>I hope the first step is to properly define "toxic" and "non-toxic" and that we will use rational scientific-based information to create these definitions.</p> <p>I hear these words used incorrectly all the time, especially by those demanding that only non-toxic ingredients be used or by those selling products that supposedly "contain no chemicals" and are completely "non-toxic".</p> <p>I wonder how they made these "chemical free" products, since everything, except light and electricity, is a chemical? This is just a bunch of nonsense and "non-toxic" is just a marketing word with no set scientific definition. Other than food, what isn't toxic to some degree? Salt water and rubbing alcohol are both "toxic". Are we going to ban them next?</p> <p>We need to get past the "Marketing" of Green and get serious about the subject. Personally I'm tired of hearing irresponsible marketers and activist use these incorrectly to frighten the public and law makers- suggesting that "non-toxic" should be the goal and anything less is not good enough.</p> <p>Unfortunately, this is usually just rhetoric... and not based on anything factual or scientific. We've got to stop this type of dangerous thinking before we can make improvements. In my opinion, those who use irrational fear and paranoia to push forward their own agendas are the bigger problem. We need scientific facts to solve these issues, not more "spin".</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-10	<p>Here are my main points to add to the discussion.</p> <ol style="list-style-type: none"> 1. Precautionary principal - Require that producers of materials including chemicals prove they do not hurt human or life-support system health before they are allowed to be sold. Such a requirement would go a long ways toward our cradle to cradle ideal for everything. 2. Law - Pass a law that requires the manufacturer of health and life-support harming materials to pay into a fund that the state and its municipalities can use to properly recycle discarded materials or their residues that end up in the state. A proviso to this law would be that the more harmful materials a manufacture creates the more they will have to pay into the fund. This will incentives material manufacturers to come up with chemical solutions that get the job done while being life-support system benign. <p>More on this subject can be found on my web site, www.jimbell.com <http://www.jimbell.com> . Then click on Jim's First Book then on Chapter III: Eco-nomics: Exposing the Myth of Economy vs. Ecology</p>
J-GC-11	<p>There are two ways I believe we could solve this problem:</p> <ol style="list-style-type: none"> 1: We could have government subsidies on CFLs to encourage consumers to spend their money wisely. Considering how big of an issue global warming is, and how much the current administration has complained about foreign energy dependency, I believe this would be an appropriate use of government funds. 2: Another way we could address this problem would be to start a program to donate CFLs to those whose incomes fall beneath the poverty line. One way to do this would be to have them given out with food stamps (without detracting from the amount that they receive for food stamps) or to put donation bins in various care providers for the poor. <p>Another thing that came to my attention recently was the extreme energy waste in theme parks, such as Disneyland. I believe we could start a lobbying effort to get Disneyland to convert to solar power. They have such resources that this conversion would almost immediately become profitable, and they could even sell some of their energy to the people in the surrounding area. I emailed Disney about this issue but they did not repond; partially, I think, because I am one person with very little political voice. I would like to start a campaign to encourage them to convert to solar power, but I'm not entirely sure how to go about doing that.</p> <p>Thank you for your time,</p> <p>~Kathleen Richter</p>
J-GC-12	<p>I believe non-toxic is over stated. Reduce risk is the direction we should head.</p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-13	<p>The Silicon Valley Leadership Group, which represents 210 employers in Silicon Valley, would like to offer our perspectives mainly as that of chemical end-users, especially in respect to R&D efforts that often use small quantities of tightly managed chemicals to drive technology breakthroughs. We propose the following ideas under this topic:</p> <ul style="list-style-type: none"> • As Ken Geiser with the UMass Lowell Center stated, green chemistry is a perspective and an approach, not a technology. Therefore, it can't be legislated or mandated, but can be nurtured and encouraged. It's a journey, not a destination. Government's role should be carefully considered, and devoted to the highest priorities for impact. • Encourage – do not regulate. Regulation cannot keep up with technology. Carefully consider how much it would cost the state to police any new mandates versus establishing a voluntary program. Regulatory agencies need to be partners, not just punishers. Emerging trends of socially responsible business can enable this cooperation. Comprehensive product lifecycle documentation is growing, driven by the private sector. Responsible product procurement is also a growing trend. • Be respectful of the current practices of corporations. Many high-tech, bio-tech and pharmaceutical organizations have effective and well-established processes in place to screen chemicals before they are used in the workplace, in their manufacturing processes and in their products. They work diligently to protect their employees, their customers and the environment. • Include small businesses in the Green Chemistry planning process. Set up an education program as many may not know how to properly handle chemicals. Sometimes there are language barriers and cultural differences. • Create a system which will encourage continual progress rather than one-time improvements. • Establish fair and reasonable funding mechanisms. • Use caution when banning substances outright. Even the most hazardous chemical does not pose a risk if it cannot get into the human body. In some cases, the chemical may be used in a manufacturing process, but not be in the final product so there is no public exposure. Carefully weigh the benefits of the chemical vs. the risk; in some cases the benefits may outweigh the risk. • Manufacturing is increasingly globalized. The requirements of California, other states and the international community are becoming increasingly integrated. In order to improve compliance, reduce cost, and minimize competitive impacts, the laws of California should harmonize with those of other states and countries. This will avoid dumping and justice concerns as a result of California policies, as well. <p>• Incentives: Encourage development and implementation of green alternatives through many incentives such as awards, contests, grants, streamlined permits or similar business-enabling actions.</p> <ul style="list-style-type: none"> o Major corporations could work to comply with standards set by NGOs and thereby be listed as green. Many people are investing in green companies and this would increase the value of the shares. o Advertise green businesses. o Provide for a reduction in fees if a corporation is in compliance with or outperforms established standards. Aim for revenue neutrality; discourage negative practices and reward better practices. <p>• Partnerships: Increase the interaction and collaboration between industry and academia to develop greener substitutes for certain chemicals and/or processes.</p> <ul style="list-style-type: none"> o Develop internships in industry so chemistry students are exposed to the private sector processes and decision making as soon as possible. o Chemical safety, pollution prevention, environmental fate, toxicology and green chemistry curriculums should be expanded in secondary and higher education. Industry can help design a relevant curriculum. o Introduce principles of green chemistry at the middle school level. <p>• Tools and Resources. If the Pfizers and DuPonts of the world develop a green chemistry tool, they can be encouraged to share it with others lacking the resources or expertise, potentially through licensing agreements or creative intellectual property arrangements (such as the Creative Commons model).</p> <ul style="list-style-type: none"> o In the future these tools could be a whole subset of the Green Chemistry Revolution. Consultants, open sources software packages, web pages, etc. would provide a way

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
	<p>for information to be exchanged and utilized to make greener products and services.</p> <ul style="list-style-type: none"> • Provide regulatory agency technical expertise to organizations without robust internal resources or to those in more traditional or stable manufacturing processes. o Include small businesses in the green chemistry process. Set up an education program for them as many may not know how to handle chemicals. Be sensitive to language and cultural differences. • Retraining: Establish certificate programs and/or refresher seminars for the current chemicals workforce. Small/medium businesses do not have the resources available to develop these programs. • Substitutes: Manufacturing processes can be extremely complex. Determining the suitability of alternative chemicals requires a thorough understanding of the toxicology and environmental fate of proposed alternatives, in addition to performance characteristics, to avoid substituting one problem for another. In addition, chemical substitution can take considerable time and financial resources for businesses to research, test and qualify product changes. • Reporting: Any proposed chemical reporting frameworks should make use of and integrate with existing systems, rather than create new ones. Most regulations do not deal with the entire product life cycle; at best we are only looking at small pieces of the whole puzzle. A move to electronic reporting would enable more accurate information that is enables better analysis (see the Santa Clara County Fire Chiefs Association Unidocs web-based hazardous materials reporting system: http://www.unidocs.org/index.html). Clarify the aims and benefits of reporting. Be respectful of resources. • Information: Develop a centralized database of chemicals and their properties to share information among users, insurance underwriters, manufacturers, retailers, raw materials suppliers, the government etc. Be sensitive to trade information. o Avoid standardized lists that are currently available. In some cases the chemical may be on the list for its physical properties (ie. flammability), not because of its toxicity. Policy action on chemical risks should be prioritized according to toxicological and epidemiological data. Prioritize action according to sound scientific data.
J-GC-14	<p>We can move from cradle-to-grave to cradle-to-cradle when the market drives this process, i.e. a green product is a better product, a green product is favored by consumers/clients.</p> <p>Green industries will be the ones surviving because there operations are sustainable.</p>
J-GC-15	<p>Our company provides services to businesses not the general public. Parts of our services include chemicals used for water treatment. There are a range of chemicals. Some are synthetic and some are derived from biopolymers. We feel that there is a major difference in the potential for long term safety and impacts on human and environmental health. We do not want to be part of a future problem by providing chemicals that we feel may have negative impacts in the long run. However, currently there is no proactive mechanism to set the conditions for chemical selection by our clients besides price. There is a reactive method solely based out of a concern of long term liability, but, in truth, that is exceptionally hard to qualify due to the lack of a regulatory framework.</p> <p>Businesses, in general, are not nearly as receptive to paying more to do the "right thing" because they have to compete against other businesses. Consumers make health and safety choices for themselves and if they chose to spend more to do the right thing they are not at risk of losing business. I have been on the front lines of talking to managers about making those choices. A few will chose the more environmentally safer alternative if it cost more, but they are a small minority from my experience. It is not that those who do not choose the environmentally safer alternative are all bad people. Currently, they are not breaking the law by choosing synthetic materials that could have negative impacts. It is hard for many people to envision that their actions will have a material impact on the environment or health so they chose the cheaper material. I am frequently asked if it is illegal to use a material for water treatment. The answer is no. It is illegal to use the material in a way that negatively impacts the environment. However, there is so little enforcement of current environmental standards and, except in blatant cases, it is very hard to tell that some action has a long term impact. This is especially the case when they are not required to test for the material or its impact. Many times I have been told that unless it is illegal they want to use the cheaper alternative.</p> <p>We want to be part of protecting the environment and human in both the short and long term. The problem is that we do not feel that there is any type of framework that creates a business environment that provides any real incentives or rewards to clients that use safer materials (and/or operating methods). In fact, those that chose safer materials are penalized by lower profits then the guy next door.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
	<p>I agree with a comment by an earlier post that says that it is hard to actually define what is "safe" or "non-toxic" versus "unsafe" or "toxic". Just because something is natural does not ensure that it is "safe". Sorting out what is acceptably "safe" or "non toxic" includes not only the material, but how it is used. No mater how problematic it is to categorize these types of issues, I think it is critical to proactively moving to green chemistry (at least in our industry).</p> <p>Like it or not, I firmly believe that when it comes to getting the majority of businesses to move towards consuming green chemicals the state sets the bar and the operating parameters. Business groups squeal like stuck pigs when they have to make changes. Air bags were going to bankrupt the auto industry; Removing lead would bankrupt the gas companies, etc. In reality when there is a demand solutions tend to appear. Without the demand (or push) no better solutions would have appeared. So if the State (or other governmental entity) does not set the standards and framework that push or provides incentives to businesses to use green chemistry, it is not going to happen based upon my experience.</p> <p>Part of the framework is going to involve the difficult process of deciding the parameters for which category a chemical (and it use) falls into. Otherwise as an earlier poster noted, People claim a material is "non-toxic" when it is not, etc. We have been down this road with the water boards. At one point, a regional board developed some basic framework for using polymers in stormwater treatment. Part of the requirements included being able to test for the material at a level below its toxic threshold and a filter capable of removing the chemical prior to discharge. These requirements opened up a host of questions such as the validation of the test? What was an acceptable filter? What about by-products? No one was sure who had the authority (or time) to answer these questions. A bigger problem was that there was some serious doubt that the regional board actually had the authority to put in place even those requirements.</p> <p>I think the green chemistry initiative is a great idea. I think that the long term use of a lot of the materials currently being used (and ones not yet developed) will have serious consequences for our health and environment in a cumulative manner that is not readily apparent by people when they make individual decisions. I want to be able to be a part of a business that has a positive impact on our society, but we need to have a regulatory framework that not only encourages and supports but actually drive movement in the direction of green chemistry. This can be through prohibitions, costs structures, or different operational requirements for using non green chemistry. I really hope something does come from this effort and it is not just another lofty goal without any real mechanism for making it happen on the ground. It will not be easy to figure out how to do it, but without it, I do not see widespread adoption of green chemistry by businesses.</p> <p>Sincerely, Joe Gannon</p>
J-GC-16	<p><i>[This comment has been moved to the "Toxics in Products by Design" discussion.]</i></p> <p>We have been very active in attempting to be green in using all biodegradable cleaning products by using Shaklee green products for years. Thank you for establishing this Initiative for helping to keep California Green.</p> <p>However, there is one glaring problem with the major cities of California and about 1/3 of the drinking water distribution companies in the US. Instead of using chlorine as a primary disinfectant along with prefiltration of surface water sources to avoid the disinfectant-by-products, they are now using chloramine which is a combination of chlorine and ammonia. <i>[Please see the Toxics in Products by Design discussion for the complete text of this comment - Web Coordinator]</i></p>

Conversation With California Forum And Journal Comments Green Chemistry Initiative

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-17	<p>Dear Secretary Adams:</p> <p>The Dow Chemical Company (Dow) applauds the goals of California Environmental Protection Agency's Green Chemistry Initiative. We appreciate the transparent process that Department of Toxic Substances Control (DTSC) Director Gorsen has adopted and look forward to contributing to the broad collaboration now known as a "Conversation with California." In that spirit, we offer these initial comments as part of that conversation. We were pleased to speak at the DTSC's first Green Chemistry Symposium in October 2006 in which we mentioned just some of the ways Dow is developing greener products and processes.</p> <p>Green Chemistry is a framework that has driven numerous improvements over the past decade resulting in a variety of products and processes with a lighter environmental footprint in numerous organizations including at Dow. Dow is the recipient of several Presidential Green Chemistry Awards recognizing Dow innovations in products and processes. In California, Dow recently received one of the first Pollution Prevention awards from DTSC's Chemical Industry Challenge Program. Globally, Dow, through its 10 year "2005 Goals," achieved reductions of 1.6 billion pounds of solid waste, 183 billion pounds of wastewater and 900 trillion BTUs of energy – enough to power 8 million U.S. homes for a year - just as examples. The \$1 billion investment to achieve these results saved \$5 billion in return. Dow's experience, through its 2005 goals and other activities, has demonstrated the strength of science and technology to solve problems, the positive relationship between green chemistry and economic prosperity, and the power of innovation when the intent is clear and the approach is flexible. It was based on this success that Dow established its 2015 Sustainability goals focused on three areas:</p> <p>We will collaborate with people in our communities and others to help create stronger, safer communities. Our goals:</p> <ul style="list-style-type: none"> • Local Protection of Human Health and the Environment • Contributing to Community Success <p>We will innovate to improve confidence that our products are managed safely throughout their lifecycle and develop products that will make a lasting, positive improvement on the world. Our goals:</p> <ul style="list-style-type: none"> • Product Safety Commitment • Sustainable Chemistry • Products Designed to Solve World Challenges <p>We will elevate our understanding of our impact on global ecosystems and work towards the efficient and effective use of our precious resources. Our goals:</p> <ul style="list-style-type: none"> • Energy Efficiency and Conservation • Addressing Climate Change <p>More details on all of the goals are available at http://www.dow.com/commitments/goals/index.htm</p> <p>One goal, the sustainable chemistry goal, is of particular relevance to California's Green Chemistry Initiative. This goal uses green chemistry as its foundation and incorporates a life cycle approach. Using a life cycle perspective is critical if we are to stop creating solutions that have unintended consequences in other areas. History abounds with these examples: One such example is the use of tetraethyl lead in gasoline to improve performance and fuels efficiency. Although and effective additive in gasoline, emission of lead and the corresponding human health effects are well documented. Society then turned to methyl-tert-butyl ether (MTBE) which again met the performance needs of gasoline, but raised groundwater contamination concerns. Now the fuel additive of choice is ethanol which is creating disruptions in the food supply, particularly for economically disadvantaged people. Each of these products could have been considered green chemistry if not viewed from a life cycle perspective.</p> <p>In addition, Dow is working to incorporate the social value of a product or service into the assessment. Not all solutions are of equal value to society. Those, which meet basic human needs for food, shelter, water, health and security on terms the poor can afford, are clearly of greater value than luxury items, iPods versus water pipe for example. Measures of social value are a challenging, but critical and evolving area, of sustainability.</p> <p>Inherent in any life cycle approach, which looks across a broad array of dimensions, environmental and social, is an acknowledgement of trade-offs. It is highly unlikely that one product or service will perform better across all dimensions. Today these tradeoffs, while being made, may not be acknowledged up front. For example, corn to</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
	<p>produce transportation fuels may improve the country's energy security, but corn also has issues with topsoil erosion and fertilizer runoff. Compact florescent bulbs are lower energy and longer lasting than incandescent, but they also contain mercury which can be released into the environment if not recycled. In manufacturing processes, there are trade-offs that must be made on a much more basic level: renewable feed stocks vs. energy consumption vs. inherent hazards vs. efficacy of the product vs. cost to produce vs. waste production, etc. Some green processes can improve several of these dimensions, but rarely can they all be improved. If we are to make better decisions for the long term, these tradeoffs need to be understood and communicated from the start.</p> <p>Dow views our 2015 sustainable chemistry goal as integral to refining our decision making as a company using a sustainability perspective which drives innovation throughout the company. We would applaud DTSC using green chemistry to promote innovation in California as well. Innovation is a process that can be fostered through incentives and clear visions. It does not lend itself well to regulation or mandates. Flexibility will allow organizations to apply their full capabilities and unleash the creativity of their people to develop solution not yet imagined. And we need to remember that "breakthrough" innovations and discoveries are hard-fought, difficult and time-consuming undertakings. We should not lose sight of the incremental improvements in safety, toxicity, energy consumption, waste, etc., being made every day. Incentives clearly could be used to reward innovators and early adopters of new products and services. While incentives can be constructive in nurturing new technology, they are not a long-term solution. Dow feels that products, processes and services must ultimately be profitable on their own to be truly sustainable.</p> <p>We caution DTSC against prescriptive approaches and approaches which are narrowly focused. Many would frame the Green Chemistry Initiative very narrowly, with a focus on toxics use reduction or renewable feed stocks promotion, etc. Green chemistry is about using chemistry in safer and more novel ways to deliver solutions. Dow encourages DTSC to approach green chemistry as an opportunity to</p> <ul style="list-style-type: none"> • spur innovation through incentives • incorporate life cycle perspectives into decision making • account for the social impacts and benefits that products and services provide and • be transparent about the trade-offs made across the dimensions of the life cycle as we improve our solutions over time. <p>Again, thank you for the opportunity to engage in open and frank dialogue on an issue of such importance. We look forward to continuing the discussion and we are available to clarify any of these comments or offer opinions on the Initiative as it advances. I can be reached at (925) 432-5122 or fischback@dow.com</p> <p>Randy Fischback Public & Government Affairs Cc: Maureen Gorsen, DTSC Jeff Wong, DTSC</p>
J-GC-18	<p>We prefer to emphasize strict labeling of contents as opposed to strict prohibitions and paperwork obstacles that favor large corporations and shut out smaller more innovative corporations. This can be characterized as rewarding good behavior and proper disclosure rather than punishing and burdening good and bad equally.</p> <p>Bob Rawson President, International Wastewater Solutions Corp. iws@sonic.net</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-19	<p>Green Chemistry through Responsible Care</p> <p>Green chemistry is a concept of eliminating a source of hazardous chemicals before you ever create them. The goal is to fix the problem (generating waste) up front without having had to deal with it at the back end. If we generate material at the back end, we have to protect, secure, and eventually dispose of it. The end result is a greater risk of exposure for the company and the communities.</p> <p>Our State is looking for a way to address this issue. I propose there is a method already out there that responsible chemical companies use to address hazards to themselves and the community. That is the Responsible Care Program of the American Chemical Council. The Program utilizes a Responsible Care Management Systems (RCMS) to go above and beyond government requirements, and the results are communicated openly to the public. RCMS consist of an integrated and structured approach to drive results in seven key areas: 1. Community awareness and emergency response, 2. Security, 3. Distribution, 4. Employee health and safety, 5. Pollution prevention, 6. Process safety, 7. Product stewardship. Companies follow these established management system to ensure that their processes are operated as safe as possible and their products are handled in a stewardship manner.</p> <p>The basic credo of this management philosophy is “Plan-Do-Check-Act”. Before an operation is going to be performed in an area, it is planned out very extensively. There are a variety of tools the chemical industry has been using (Environmental Health and Safety Reviews, Root Cause Analysis, HAZOPS (Hazardous Operations), etc). All these methods have degrees of analyzing the systems in which we look for risks and either eliminate, substitute, or control them. An example may be for a chemical that can cause a fire or explosion hazard. The first goal would be to eliminate it. If the process needs the chemical, we will try to substitute it for a less flammable one. If we can’t eliminate it or substitute for it, we will control it. One of the best controls is to minimize the inventory of the chemical on hand (i.e. to limit the amount of fuel). We do the evaluation process until the whole operation is planned out. This planning process minimizes the risk before an operation is even built. Once it is planned out, we “do” it. We follow strict guidelines in implementing the process as spelled out in the plan. We monitor it closely so no short cuts are taken. The third step is to “check” it, or as I like to say, “did you do what you say you did?” We do an analysis of the system to make sure that we are doing and getting the safe design that was planned out. This is the quality control step of the process.</p> <p>The final check is “act”. Simply put: if anything is out of compliance with the plan, we correct or act on it. This is the correcting of the ship when it moves off course, or correcting the process before a real upset condition happens.</p> <p>The above process of Plan-Do-Check-Act is a defined method used by the chemical industry. This ensures that the chemicals being handled are done in the safest manner possible and it also minimizes the generation of off-quality (hazardous waste) material. This process demonstrates that chemicals can be used in a “Green” manner. A link to the Responsible Care site can be found at: http://www.americanchemistry.com/s_responsiblecare/sec.asp?CID=1298&DID=4841</p> <p>Robert M. Hafner, ASP Safety Manager,</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-20	<p>An Idea to be Included in to K- 12 Education</p> <p>I found out that some college students (not in a science major) do not know that a florescent lamp or a TV in their room becomes hazardous when they break. The representatives of the Chemical companies told at the “Green Chemistry” meetings at DTSC, all chemicals that are used in a home and garden will become hazardous if they are not used in recommended quantities and not disposed in a safe manner. This principle will be true for new “green chemicals” as well.</p> <p>“Safety Ville USA” is a place for school children to learn road hazards and how to follow road rules. Based on a similar idea, California can develop a “Safe Home and Environment” place for children to visit and learn about household hazardous substances, safe use of products and safe disposal of wastes. Information about exposure symptoms can be handed to them. This may be a good place for children to be exposed to “Green Chemistry Principles” and encourage students to learn chemistry. The state of California could ask the Chemical Industry and non profit organizations to fund such a project. As new scientific knowledge come to our attention, such a place can be updated and modified to teach new principles to children. “Green chemistry” practiced in Europe and other countries can be taught to Californian children to think beyond our borders and study/adopt working models from other countries.</p> <p>In addition, this learning environment can promote “Green Products” to the next generation of consumers. Currently Polylactic acid polymers derived from plants such as corn are used to make biodegradable and compost-able bags containers etc. The current research seems to indicate these bio-plastics can replace the petroleum based plastics. However these alternatives are not brought to the attention of an average Californian since they are used mostly in Europe. Although the costs of such products are higher than the petroleum based products, many Californians may be willing to buy “Green Products”. Businesses such as restaurants who like to go “Green” may add the cost, check the marketability and pass the cost to the consumers. The education of people of California will push the businesses to go “Green”.</p>
J-GC-21	<p>I would like to recommend that you consider the National Research Council of the National Academies' report "Sustainability in the Chemical Industry." For more information, please refer to my submission, posted on July 26th, under the Cradle to Cradle category.</p> <p>Appendix E of this report is available through the following link: http://books.nap.edu/openbook.php?record_id=11437&page=156</p> <p>Respectfully submitted, Merob Shimeles, DTSC 2006-2007 Executive Fellow</p>
J-GC-22	<p>Thank you for allowing me to add to the comments that the state of California is gathering for future policy on green chemistry. It is in the state's long-term interest to create and institute laws that incentivize the creation of new, green chemistry products while disincentivizing the use of chemical products in our state that open the door for class action lawsuits. In addition, the value-added, green chemistry products of the future that move from the college lab to the companies here in the Golden State creates the types of clean jobs that state legislators in California should focus on enabling in the 21st century. The workers that hold these types of jobs would not only be creating these green chemistry products for the USA marketplace; they would be creating products for a vast international market awaiting such innovative products.</p> <p>Moreover, since jobs related to exports spike payrolls, the state can expect an expanded tax base while at the same time addressing quality of life issues that are real and amplified by the huge population we have. With its great university system, VC community and vibrant entrepreneurial class all contributing to an economy that dwarfs every other state, California legislation continues to need to be as oracular as possible to lead the country and the world in undoing the damage that we have collectively wrought. In "The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life", its author, Dr. Florida, talks about how knowledge workers now and in the future will want to live and work for companies that have vibrant and stimulating entertainment, social, artistic and and outdoor activities in their communities. California has several clusters of communities that have these prerequisites. But if access to these after-hours work activities continues to be offset by serious environmental problems, these types of specialized workers will go elsewhere thus hampering our state's ability to compete, let alone lead and influence, so much of the business and cultural world.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-23	<p>CYANIDE IS GREEN If “cradle to cradle” is a trait that helps define the concept of GREEN CHEMISTRY, then Cyanide should be considered GREEN because, when used properly, Cyanide is a Cradle to Cradle “Enabler”.</p> <p>CYANIDE IS A VALUABLE RESOURCE AND AN ELECTRO-PLATERS’ FRIEND Cyanide is a simple compound that contains Carbon and Nitrogen (CN) attached to a metal. It acts as a “solvent” and complexes with many heavy metals and allows electroplaters to dissolve the heavy metal compounds into aqueous mixtures. Some of the electroplaters’ commonly used compounds are cadmium cyanide, copper cyanide, potassium copper cyanide, sodium copper cyanide, gold cyanide, potassium gold cyanide, sodium gold cyanide, nickel cyanide, silver cyanide, potassium silver cyanide, sodium silver cyanide, and zinc cyanide.</p> <p>CYANIDE HAS MANY “POSITIVE ADVANTAGES” It is an excellent metal “CLEANING AGENT” in the preparation of the parts to be electroplated. It is “EASY to DESTROY” allowing heavy metals to be readily precipitated and removed from the waste stream generated in the electroplating process. It increases production yield percentages by reducing rejects because of its “FORGIVING PROCESSING PROPERTIES” such as tolerance of contamination and contemporaneous cleaning ability. It saves electricity, water, and labor by minimizing stripping and re-plating that are needed with less robust processes. It allows stable multi-metal plating solutions to be built (constituted) for “ELECTROPLATING METALLIC ALLOY DEPOSITS.” These alloy deposits can have characteristics that are far superior to a single element metal deposit, and can improve the properties of commercial and industrial hardware and products. The use of cyanide as a stripping agent can also prevent damage or scrap to many types of substrates that are compatible with it. Although cyanide has short term toxic properties, it does “NOT ACCUMULATE IN THE HUMAN BODY” and is “DEGRADABLE” in the environment.</p> <p>CRADLE TO CRADLE FOR CYANIDE CHEMICALS: The life cycle of metal cyanide complexes used in the plating industry typically follow these steps: 1. Metals are commercially mined from the earth; 2. Metals are converted to metal cyanide complexes; 3. The metal cyanide complexes are dissolved in aqueous plating solutions creating metal ions; 4. The metal ions are reduced (electroplated) using direct current with the electrons attracting the metal ions causing a chemical reduction to a metal atom on the part being plated; 5. The residual plating solution on the parts that is not directly returned to the process is rinsed off with water and are routinely conveyed to a permitted waste treatment facility. 6. The cyanide is destroyed in the waste treatment process, releasing the metal ion to be converted to a metal hydroxide for gravity precipitation. 7. The precipitate is dewatered using filters and becomes plating sludge; 8. The plating sludge is sent to be recycled (usually in metal mining and smelting operations); 9. The metal is then recovered and recycled to be used another day.</p> <p>In general use, cyanide has the reputation as a dangerous and deadly compound. However when cyanide is used and treated/destroyed at regulated metal finishing facilities, there has been virtually no record of public exposure to the notorious effects of cyanide poisoning. Cyanide promotes the cradle-to-cradle concept by enabling the simple recycling of many tons of valuable metals each year that otherwise would fall into the cradle-to-grave mentality and be disposed off at a hazardous waste landfill.</p> <p>Note: EFFECTS OF SHORT-TERM EXPOSURE OF CYANIDE: Sodium cyanide irritates and severely damages the tissues of the eyes, the skin, the respiratory tract, and the oral and gastrointestinal tract. Cyanides poison the vital organs of the body (for example, heart and lungs) including areas of the brain that regulate the proper functioning of those organs. Exposure may result in convulsions, unconsciousness, and death.</p> <p>Sam Bell Water Quality Committee Chairman Metal Finishing Association of Southern California sbell@metalsurfaces.com</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-24	<p>We already know what materials work, and what don't. It's greed that prevents us from going green. In order to clean our act up, we must focus on the route of the problem-Petroleum. As a consumer we have a choice, but as more plastic bottles replace glass; we are forced to buy toxic packaging. I think that every state could do more to recycle, and offer rewards to individuals who make bold steps to eliminate waste. We must voice our opinions, and create laws that will convince businesses to reduce waste in their packaging, and production. Logistics facilities should be monitored, and fined for excessive waste. Simply put-the less petro-plastic- the better. Cancer is on the rise, and there is no doubt in my mind that plastic bottles contribute to this rise. Time is now to act, for our health, for our environment, and for our independence.</p>
J-GC-25	<p>I have been conducting research in re-formulations and re-engineering of chemical processes for more than 14 years. I certainly favor the idea of designing chemicals in a way that eliminates 'waste' of any sort wherever possible. However, my own experience indicates that the matter of as little as two cents per gallon can currently sway a manufacturer one way or another on which processes are used to create chemical products. One of the ways I see government (i.e., green chemistry initiatives) 'supporting' new formulations and new process patents is through taxes and incentives. The carrot and the stick still works, even if it is not subtle.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-26	<p>The Green Chemistry Initiative held a public stakeholder meeting on August 17th in San Jose. The goal of this meeting was to gather input that will provide recommendations for developing a consistent means for evaluating risk, reducing exposure, encouraging less-toxic industrial processes and identifying safer alternatives. The comments below were received as a direct result of the breakout session on green chemistry. If you have any thoughts or suggestions on the ideas shown below, please respond and share your views.</p> <ul style="list-style-type: none"> • What is green? • What incentive the government provides the industry to move to green chemistry. • More involved relationship between the industry and academia with regards to toxicology. • Alternatives developed by universities. • Industry sharing best practices. • Rating and labeling system. • Information for the consumer in the supply chain. • Have an expansive view of green chemistry-not just substitutes. • Need to identify incentives for industry. *R&D tox credits *Tox credits for green chemistry capitol investments *Low interest loans *Technical assistance • Branding for Green Chemistry products. • Promoting academic programs. • Leverage data from other sources as a starting point. • Changing the consumer marketplace/attitudes. • Can not rely on consumer choices. • Better design up front. • Prioritize bad actors for restricting use. • Risk based on most vulnerable. • Already looking at every phase of exposure. • Will Green be hot tomorrow? • Disagreements as to what is toxic. • Companies not sure what they need? *GC and sustainability *Companies are innovators • Some are formulators. GC needs to come from innovators. *Incremental improvements! *Work day in/day out • Working on life cycle analysis. • Get away from idea we need to do things as always done. • Stakeholder meetings-discussion w/out penalties.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
	<ul style="list-style-type: none"> • We generally have same goal, different ways to do it. • Celebrate successes-Look for good rather than focus on the bad. • Look for commonality. • Celebrate best practices. • Green business program. • Ecomark locks in standards of today's technology-needs to take into account innovation. • Not that one product is better, but rather illumination of process. • Do something w/information! • Encourage sharing of existing Green Chemistry practices, incentives and barrier. • Better understand specific data gaps. • MSDS • TDS • C of A • Grants program. • Taxes or fee (panalize) for company not following GC. • Incentives for company that do GC. • Work at university. • Corporate education-exchange of information including BMP's. • Use public to drive GC. Credit database for public to get green information. • Green label. • Green seal-state certification. • Check state standards for labeling it. • Add Green Chemistry performance criteria to end product requirements> will influence design. • Want "harmonized" regulatory structure. Ex. Asia should have same requirements as CA. Make CA a front-runner/leaders' not an aberration. • Tax credit for R&D. • Help buyers track their purchases for qualities they thought they were buying. • Industry mentoring [large to small] • Train chemistry students in ecotox + green chemistry. • Use ACC and large orgs to facilitate interactions between industry and customers + include mentoring. • What is Green Chemistry? Define it! Include molecules. Research and development incentives for least toxic products alternatives. • Early childhood development chemical impact research should focus. • Testing methodology mechanisms. • Database of chemicals to safely identify alternatives. Alternatives analysis. • Encourage cooperation. *Patent system? • Educating consumers about the advantages of buying green products. • Environmental footprint labeling on products a.k.a. "wine spectator model".

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
	<p>**Done by a credible 3rd party</p> <ul style="list-style-type: none">• Replace low bid with lifecycle cost analysis in public contracting.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

GREEN CHEMISTRY (JOURNAL)	
Number	Full Comment
J-GC-27	<p>Any regulations requiring registration or restriction of chemicals should only apply to formulators/ manufacturers of raw substances/ preparations and the first user of raw substances/ preparations in the manufacture of simple components. Chemicals in their raw form are the most potentially dangerous to people and the environment. Substances in electrical components are by-and-large stable and stay in the component. Substances in manufactured electrical components are far safer than the chemicals in their raw form, which are more reactive and in much higher concentration. Regulation should not cover finished electronic products.</p> <p>Substances part of any potential regulation should be prioritized with regard to their hazardousness. Substances should be added to the list of regulated substances only in small periodic batches such as the Canadian Chemical Management Program (CEPA 1999). http://www.chemicalsubstanceschimiques.gc.ca/challenge-defi/index_e.html#1. This would improve the ability of manufacturers to comply with the program and for CA regulators to administer the program. This method is preferable than having a large number of substances all be subject to regulation at one time such as under the European REACH (Registration, Evaluation, and Authorization of Chemicals). Any deadlines associated with the regulation should be of a time period spanning a number of years in order to give all chemical manufacturers sufficient time to comply with the requirements.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
J-TD-1	<p>Please don't lose sight of the environmental advantages provided by plastics. These include ... a less-hospitable surface for bacterial growth (vs paper bags, wood), ... less accidental injury (vs glass, metal), ... lower energy consumption from start to finish (especially PVC, which uses less energy in manufacture and use than most all other materials), and ... potential for energy recovery either via incineration-to-power or recycling that replaces new material manufacture (the most meaningful form of recycling).</p> <p>Please also don't get caught by pseudoscience that talks about harmful chemicals as if "chemicals" were a dirty word (we are all made up of chemicals), or a passion for "natural" as sacred, as if man-made/synthetic/processed were evil. The words are grossly abused, as some of the most toxic substances are "natural" (e.g., snake venom, tobacco) and many "chemicals" make our lives safer and healthier (safe drinking and swimming water, synthetic insulin, and countless household and medicinal "chemicals").</p> <p>Lastly, don't lose sight of an old medical maxim, "the dose makes the poison." It's how much that counts, so that if someone says "that contains "xyz" we have to know how much xyz, and what the effects of that much might be. There are certainly substances that should be minimized and avoided, and in fact California is a leader in raising the nation's consciousness to this effect. Please continue that leadership with sound scientific and medical bases, and don't be swayed by people with pre-set agendas, often well-meaning but nonetheless wrong.</p> <p>Allan L. Griff, Consulting Engineer</p>
J-TD-2	<p>This seems as good a place as any to talk about PEX plumbing. I've read the fine print and there isn't much in the way of unbiased information. The California Plumbing Code has been lobbied by the pipe industry. Lets cut throught the big business and determine if PEX is really green and healthy. Its cost effectiveness is outweighing true science.</p>
J-TD-3	<p>I would like to see the elimination of chemicals in our lawns and gardens that are used for cosmetic purposes. i.e Scott's Turfbuilder Plus, Weed Be Gone, Roundup, etc. To facilitate this, I would like to see a law that requires new home builders to keep, or to add topsoil to a new home so that the grass or other groundcover could grow naturally without 4 applications of weed killer per year.</p>
J-TD-4	<p>... one probably need not look too far to see that the LA area is pretty bad but its so much better than in the late '50s thru the '60s. This is no longer mostly caused by automobiles but by the currently still uncontrolled exhaust from diesel engines (ships,trucks, busses, locomotives) and jet aircraft in and around the greater LA area that support the the port of LA and LAX. Confirmation is simple - just park your car for a few days at either location or drive behind a buss or big rig. All these polutients hang in there due to the inversion layer and the typical on shore winds push it inland then blocked by the mountains.</p> <p>The automobile is continusouly blamed as the bad guy and its true to some point. Hell, even small engines (lawn care, motorcycles, generators, etc) have 'polution controll systems'. However its time to establish realistic controlls on the otherwise uncontrolled emissions produced by the ships, busses, trucks, locomotives aircraft and their support vehicles.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
J-TD-5	<p>Hi, I hope the first step is to properly define "toxic" and "non-toxic" and that we will use rational scientific-based information to create these definitions. I hear these words used incorrectly all the time, especially by those demanding that only non-toxic ingredients be used or by those selling products that supposedly "contain no chemicals" and are completely "non-toxic". I wonder how they made these "chemical free" products, since everything, except light and electricity, is a chemical? This is just a bunch of nonsense and "non-toxic" is just a marketing word with no set scientific definition. Other than food, what isn't toxic to some degree? Salt water and rubbing alcohol are both "toxic". Are we going to ban them next? We need to get past the "Marketing" of Green and get serious about the subject. Personally I'm tired of hearing irresponsible marketers and activist use these incorrectly to frighten the public and law makers- suggesting that "non-toxic" should be the goal and anything less is not good enough. Unfortunately, this is usually just rhetoric... and not based on anything factual or scientific. We've got to stop this type of dangerous thinking before we can make improvements. In my opinion, those who use irrational fear and paranoia to push forward their own agendas are the bigger problem. We need scientific facts to solve these issues, not more "spin".</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
J-TD-6	<p>“What strategies do you think California should pursue to encourage manufacturers to take greater responsibility for the products they produce that contain toxic materials?”</p> <p>While pondering this question I found myself separating it into two parts. Let me explain a possible train of thought.</p> <ul style="list-style-type: none"> • The question is actually larger than the stated above because manufactures go to where there is product demand or where they think they can create product demand. So demand shift must be considered as a fundamental element in the category of “What strategies do you think that California should pursue?” • In an effort to answer the second half of California’s proposed question “to encourage manufacturers to take greater responsibility for the products they produce that contain toxic materials?” One would have to answer a parallel question first. <ul style="list-style-type: none"> o What has California done that has worked to encourage manufactures to under take greater responsibility for their products that they produce that contain toxic materials? <p>In the past history of recent decades as a consumer; I am and hopefully you are able to recall some things that have worked</p> <ol style="list-style-type: none"> 1. Legislative Efforts – have helped on numerous toxic reduction efforts. Example <ol style="list-style-type: none"> a. Mandatory emissions standards for automobiles in California. This has had a tremendous impact by mandating a shift in demand allowing the auto manufactures to voluntarily comply if they want to participate in the California market. 2. Usage Fees (Tax) can help to move a products sales price closer to the total product life cycle costs (inclusive of decommissioning, disposal, clean up, associated human health care cost, and environmental rectification costs that are now born by tax payers). <ol style="list-style-type: none"> a. Bottle Tax. – gives an incentive to be environmental conscious to reduce the toxins in the waste we consumers create b. Cigarette Tax – provides a disincentive for consumption. 3. Rebates for use of preferred product purchases – Example <ol style="list-style-type: none"> a. Rebates for Hybrid automobile purchases. <p>As a possible thread here I would like to solicit input from others that could help expand the list of - What has California done that has worked? Then we can shuffle the tools successfully used in the past, against the new issues of concern.</p> <p>For example: If we wanted to reduce the consumption of one time use plastic (and paper) shopping bags, a usage fee could be charged per bag at the point of use. At some point in on a cost matrix, the cost to use them would begin to out weigh the inconvenience of bringing you own.</p> <p>We can also explore the gaps and opportunities of what has worked before to discover the fresh new ideas that will cause others within their sphere of influence to rise to the occasion at hand.</p> <p>Final note and challenge: All of the examples sited above involve some financial incentive or disincentive to manipulate change in demand. I would greatly appreciate the addition of examples that apply to the more altruistic side of humanity and business ethics but they do not come readily to the forefront of my recollection.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
J-TD-7	<p>The Silicon Valley Leadership Group, which represents 210 employers in Silicon Valley, would like to offer our perspectives mainly as that of chemical end-users, especially in respect to R&D efforts that often use small quantities of tightly managed chemicals to drive technology breakthroughs. We propose the following ideas under this topic:</p> <ul style="list-style-type: none"> • Consumer Education: Well-informed consumers will not only handle and dispose of chemicals more safely, they will demand safer products with closed loop lifecycles. We need to expand consumer education regarding product life cycle costs and impacts (e.g. appropriate selection, use, disposal, and alternative materials or practices). Disseminating information could occur through traditional media as well as outreach through community partners as well as the private sector. Employers are happy to share good information with their employees. o Improve the quality of communication between all stakeholders (regulatory agencies, industry manufacturers and users, and the public) by educating how chemicals are created, screened for use, and managed through a process. Show people “a day in the life of a chemical.” o Improve transparency and public disclosure, while being mindful of intellectual property and trade information. Provide complete chemical risk information in a way the public can access, understand, and absorb. Create convenient, credible chemical evaluation tools that businesses, schools or individuals can easily use when selecting chemical products. Pfizer’s Solvent Alternatives Chart listing three columns of encouraged or discouraged chemicals for internal use is a stellar example that should be replicated. <p>Show examples of the risk as well as the hazard. Define as high, medium and low and compare to products and services used by consumers everyday. If something is a hazard, show the alternatives or how the risk relates to the pathways for exposure (Is it in a product, or solely for use in a process? If it’s in a product, what entails safe use? etc.)</p> <p>Labels, while well-meaning and accessible, can be confusing, vague, and desensitizing. Due to global distribution chains, labeling should be used with restraint.</p> <ul style="list-style-type: none"> o Enable and streamline disposal of household hazardous waste (curbside pick-up or more local collection centers.) Improve the publicity of and accessibility to this disposal. Also educate on the safety measures used around disposal centers, because community backlash toward collection points is probable.
J-TD-8	<p>I think any effort to implement green chemistry requires a huge data gathering and database development effort.</p> <p>Data should be gathered regarding all chemicals manufactured in or used in commerce in California, and how and where and in what volumes they are used. Additional data regarding available toxicity characteristics should also be gathered for each of those chemicals. Gaps in toxicity data should be identified. The data could then be used to "rank" chemicals in terms of volumes used, and toxicity characteristics. Initial efforts should then focus on working with industry to find viable, safer alternatives for the highest ranked chemicals (i.e., those that pose the biggest threat in terms of toxicity and volume), while at the same time engaging industry and our University system to fill in any gaps regarding toxicity data. In evaluating and ranking chemicals, consideration should be given to the benefits of each chemical.</p> <p>Thank you for the opportunity to comment.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
J-TD-9	<p>The City of San Clemente has begun to realize that someone has to take the lead and start moving forward on this important issue.</p> <p>They stated the following to put a city ban on styrofoam used in city facilities and sponsored functions:</p> <p>The City of San Clemente has a duty to protect the natural environment for present and future generations. The City may further exercise environmental stewardship by reducing the amount of polystyrene that enters our waste stream and by reducing the amount of polystyrene debris that enters the City's storm drains, watershed and coastal environment. By reducing the amount of polystyrene waste entering the natural environment, the City also serves to protect the fragile ecological balance of our natural environment. For these reasons, the City passed a ban on the use of single-use polystyrene foam products in City facilities and at City-sponsored, -cosponsored, and permitted events.</p> <p>I was hoping that the DTSC could do something like this for our department and branch out to other departments from there. Maybe it will catch on if DTSC takes the lead.</p> <p>Here is the attached link to view the Ban on their website. I hope this is helpful to you. http://san-clemente.org/sc/standard.aspx?pageid=453</p>
J-TD-10	<p>We have been very active in attempting to be green in using all biodegradable cleaning products by using Shaklee green products for years. Thank you for establishing this Initiative for helping to keep California Green.</p> <p>However, there is one glaring problem with the major cities of California and about 1/3 of the drinking water distribution companies in the US. Instead of using chlorine as a primary disinfectant along with prefiltration of surface water sources to avoid the disinfectant-by-products, they are now using chloramine which is a combination of chlorine and ammonia. The EPA admits in its own documents that the human health studies are insufficient to determine the safety of its use in our drinking water. So, this chemical has been put into our drinking water without sufficient human health studies. And, it is 2,000 to 100,000 times less effective against E-Coli and Rotaviruses, respectively. It has been labeled "Toxic" for the environment by Canada where accidental water run offs into their streams and rivers have killed the salmonoids in the water. We can add additional chemicals to our fish tanks to keep the fish from dying but nothing protects the frogs and amphibians from chloramine. For those of us who have an impaired immune system (in my case it is due to having six months of chemo after my cancer surgery 13 years ago) we cannot drink this water. The WHO also refers to boiling the water to get rid of the bacteria, etc., for at least ten minutes before consuming it by those with an impaired immune system, the elderly and infants under six months. However, if these people are sensitive to the disinfectant, it will only concentrate the chloramine since it does not boil out of the water as chlorine does.</p> <p>I am a part of a grass roots group who have been trying to get a waiver from the EPA to have San Francisco go back to chlorine as a disinfectant until the human health studies have been completed. At that time, when it is documented that it is not safe for human consumption, we ask that they add prefiltration to keep down the DBP's to acceptable EPA levels.</p> <p>We have heard from hundreds of people who have adverse dermal, inhalant and digestive reactions to this toxic water disinfectant since it was introduced into our water supply in Feb 2004.</p> <p>Just by having this one toxic disinfectant in our water, we are risking the health of our population and damaging the environment. Chlorine has been extensively studied for over 70 years. Chloramine has not. We can easily filter chlorine out of our drinking water in our households if we don't like the taste but the safety of our drinking water will not be compromised. However, we cannot easily filter the bonded chloramine out of the water. So, for those of us who are sensitive to it, we must purchase and carry home bottled spring water which is an additional inconvenience and financial burden. Especially for the seniors who are on a fixed income and can't handle carrying the large water bottles. I personally have to wash and prepare all of my food with spring water because I am having so many digestive</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
	<p>problems otherwise. Plus, I cannot eat out in restaurants and order anything that is boiled or steamed for the same reason. The EPS scientists have told us that they have studied chlorine and ammonia separately but have not been mandated or funded to study them together. Please help us get this studied and taken out of our water until they are completed.</p> <p>It is because of this new toxic water disinfectant that we've had such a huge increase in the purchase of bottled water and therefore, adding to our precious land fills at a much faster rate than expected. As you can see, adding chloramine to our drinking water has had many adverse effects in trying to keep California "Green". Our web site is _www.chloramine.org_ http://www.chloramine.org ... please go to it to view documented cases or rashes with photos as well as much more information about this toxin going in to our water.</p> <p>Sincerely, Claudette L. Main</p>
J-TD-11	<p>Technological advances have generated more environmentally friendly electroplating technologies (e.g., cyanide-free plating solutions). However, a wide-spread switch to more "green" plating practices has been hampered by outdated "milspecs" (i.e., the military specifications for most plating done for military and aerospace applications). Many milspecs were established one or more decades ago. Milspecs mandate a particular plating chemistry in many cases. For example, some specs require cadmium plating to be done in a cadmium cyanide plating solution for some applications, regardless of whether or not cyanide-free cyanide plating could achieve the same end-result. To facilitate Green Chemistry, one suggestion I have is to work with the military and aerospace industry, as well as the plating industry, to evaluate and revise outdated milspecs to allow for more "environmentally friendly" plating chemistries.</p>
J-TD-12	<p>Hello,</p> <p>I agree with Robert Brushia regarding the need for coordinated data collection and sharing. RoHS suffers from a lack of mandated standardized data reporting formats, just as MSDS' did until the form and content were prescribed. It's not enough, however, to just mandate what data must be reported and in what format. You also have to take a role in making the data available to others- a data clearinghouse. This usually gets the least attention, because it is seen as "too expensive" and "not our problem." These are not acceptable responses. The system must avoid the waste of effort that results from widely duplicated data collection and reporting. A central data store can help ease the burden.</p> <p>regards, Michael Cox New Almaden</p>
J-TD-13	<p>DTSC asked the following in an email: Another recall related to toxic materials in consumer products has been issued, this time by Mattel. You decide: Is this a case of toxics in products by accident or by design? Of COURSE Mattel did not specify paint with lead for their products! They're not idiots! They're just cheap - and they cut the wrong corners. My take is that this is a failure of their cost reduction strategy. Here's what I surmise happened: Go to China, be seduced by extremely low cost of goods sold, don't do a stringent audit of the contractor's supply chain business practices, fail to do follow-up audits, and WHAM! You get caught with your pants down. There are supplier management best-practices that identify and either eliminate or manage rogue suppliers; these have been around since at least the 1980s. Evidently the Toy industry (and, I'm quite sure, other industries) could use some help in this matter.</p>
J-TD-14	<p>Regarding Rob Brushia's post, the Department of Defense has a program to move towards "greener" chemistry and I'm sure would be quite amenable to hearing about this. See https://www.denix.osd.mil/. Working with the DOD, with their large physical presence in California, may be a way to leverage their knowledge and expertise and reduce the impacts of "emerging contaminants", as they call it.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
J-TD-15	<p>Quite a few years ago, I saw an article about German car manufacturing in which the cars featured were subject to regulations requiring each part of the car to be recyclable, from the steel frame to the upholstery. The article said that manufacturers were required to take their products back at the end of their useful lives for recycling in order to reduce the impact on landfill.</p> <p>Would such a policy applied to Silicon Valley have the effect of encouraging them to find green solutions to the toxics used in computers?</p> <p>Would such a policy create incentives for companies like Mattel to make certain that their products did not contain toxics before placing them on the market?</p>
J-TD-16	<p>In response to the question about the Mattel recall and if this is a case of using toxics by design or by accident, I would say it is somewhat of a moot question. In the end, the lead should not be in the paint and it is the responsibility of the manufacturer to ensure that that is the case. Clearly the lead was put into the paint by the paint manufacturer for some reason. But the downstream user, in this case Mattel, responsibility to make sure they know what is contained in their materials, manufacturing processes, and final products before they put them on the market--especially when those products are for children who are the most vulnerable to toxicants. We recognize that the information up and down the supply chain has traditionally been limited. We see two actions as being critical: 1) better toxicity and use data from chemical manufacturers, 2) insistence by end user businesses that suppliers produce non or less toxic materials for them and testing procedures to ensure that the materials they buy meet safety goals.</p>
J-TD-17	<p>It is great to see California taking the lead on this issue.</p> <p>Chemical products are of course an important part of the economy and our modern lifestyle. Thinking about the options to offer chemical manufacturers, whether including toxins by design or by accident. A. Test the product to demonstrate its safety to human health and the environment. OR B. Pay some nominal amount (or percentage of the price) per unit (kilogram, liter, gram,...) sold into a state "trust fund" used to mitigate, manage, or remedy toxic effects discovered later. Or C. Explicitly and up front guarantee the product's safety, taking full responsibility and liability for any effects that might emerge later.</p> <p>To trust the results of A, there may need to be an objective and highly qualified testing organization, plus clear established criteria.</p> <p>Thank you for the opportunity to comment.</p>
J-TD-18	<p>The Green Chemistry Initiative held a public stakeholder meeting on August 17th in San Jose. The goal of this meeting was to gather input that will provide recommendations for developing a consistent means for evaluating risk, reducing exposure, encouraging less-toxic industrial processes and identifying safer alternatives. The comments below were received as a direct result of the breakout session on toxics in products by design. If you have any thoughts or suggestions on the ideas shown below, please respond and share your views.</p> <ul style="list-style-type: none"> • If toxics in products unavailable then producer must apply for exemption and have a take back responsibility. • Weigh the benefits and risks and other impacts of take back programs. • Avoid exporting toxic products and waste to developing countries. • Shift the physical and financial responsibility of management of hazardous products at the end-of-life. • Educating producer and consumers of end-of-life management of products. • No plastic water bottles at the next green chemistry meeting. • Curbside hazardous waste collection. • Take back programs/product stewardship. • Another point of view: Do not use these products in the first place. • Stricter regulatory requirements for toxic chemical use as a stick. <p>*Needs criteria</p> <p>*Penalties</p> <ul style="list-style-type: none"> • Market incentives as a carrot. • Define Toxics by Design.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
	<ul style="list-style-type: none"> • Lifestyle analysis. • Cost benefit analysis-not consensus. • Prioritize and assess bad actors for restructure use. • Incentives *Carrot *Stick • Implement and high level so no inter agency conflicts. *Balancing concerns e.g. fire safety/health impacts of BFRs • Need to overcome need alternatives incentives. • Difference of opinion as to what is toxic. Different groups/ different ideas. How much risk? *Is there good substitute? *PBD's fire risk v health • Sustainability of company depends on good choices. • Toxics risk assessment depends on exposures. • Use best available science. • Toxicity is a continuation. • Use current best available. State of the art methodology. • Cumulative exposure counts (not just linear). • Protect most vulnerable. • Not just dose response-other data. • Reg v. accepted practice. • Science sources disagree. • Start with things on which we agree. • Mix of chemicals troublesome. • Lucky to have prop 65 list. Start with this. • Safe dose-how to determine. • Consider disposal process to determine safety. • Compromise between groups. • CMR data is good, but other methods not yet well developed. State needs to do this-endocrine disruptors, for example. • Evolutionary-will gain a lot of knowledge in next few years. • Prioritize the list (working with all groups). • All goes back to transparency. • Open conversation. • Open to new ideas. • Some companies already being open-some products more complex, though. • Just start with something. • Less dangerous chemicals. • Safer alternatives available.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
	<ul style="list-style-type: none"> • Known bad/alternatives available. • Less dangerous chemicals. • No known alternatives. • Known bad/existing no alternatives develop. • Consider exposures/hazards associated with EOL use. • Utilize existing databases + integrate different databases (initial priority). • Co. anonymously provides product chemical data into database. • Do LCA for every component of product. • Develop “appropriate” test methods. • Utilize GI processes from other countries database. • Bans with appropriate transition on toxic chemicals. • Establish criteria for bans. • ID acceptable toxic LPE levels. • Favorable treatment for green products. • Categorize chemicals and products; triage them to appropriate regulation. • Current liability law provides incentive to reduce toxics in products by design. Utility vs. toxicity>seek to maximize utility. • Screening systems for procurement to reduce toxics. • More information about how to maximize utility and minimize toxicity. Full information on alternatives and both their toxicity and utility. • Full information to end-consumer and designer and procurement departments. • Difficult to identify differences of toxics by design and by accident. • More unified regulatory system. • Prioritize what is out there. *Petroleum feed stock • Educate the consumer. *Labeling • Identify and catalog chemicals of concern. • Assemble all available information and assess-coherence and usability of existing information. • Identify, utilize, and integrate fund existing programs. • Identify high priority products and put in to place programs similar to DFE@USEPA. • Better funding for the infrastructure that allows us to treat uneliminatable toxics. • Educate public about relative risk. • Publish chemical contents of products. *On product *On the web • Toxics that remain in product vs. toxics that leeches into the body/the environment. • Recognition of stepwise improvement. *Credit the past

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
J-TD-19	Again, we're being asked if a toxin in a product (this time lead in the children's watering cans) is intentional or accidental. It remains unclear to me what difference it makes. The bottom line is that toxins should not be in children's (and other) products. It is the manufacturer's responsibility to ensure that the products they release to the marketplace don't contain these materials. While they may be misled by their suppliers as to ingredients in paint, plastic, etc, it is incumbent on them to test their products to ensure safety. If their supplier has sent them something that does not comply with their specifications, they need to deal with that directly with the supplier. But at the end of the day, it is up to the product manufacturer to make sure that they are not putting the public at risk.
J-TD-20	Andria, I couldn't agree more. Manufacturers must be responsible for what is in their products; so they must define, control, and know what should, and what should not, be there. Then they MUST ensure that the right suppliers are chosen and managed in such a manner as to ensure that their material specs are met. This does not call for any more government bureaucracy than we already have (e.g. NO import czar!) -- it calls for legal and criminal action where warranted, and for the consumer to vote with their pocketbook. And finally, it calls for industries and companies sourcing overseas to look beyond short-term cost savings and spend the time, money, and resources necessary to implement the supply base management best practices that have existed and been successful in managing supply chains for the past 20 or so years, and adapt them to the requirements of the Chinese culture, or get out of China.
J-TD-21	Ban the sale of toxics in products by design in California, if there are non-toxic or less-toxic alternatives. Especially, if the alternatives are economical. A good start would be for California to ban the sale of Mercury containing thermometers. There are plenty of alternatives that are accurate and available.
J-TD-22	Basic (good) public policy: Tax what you don't want. Specifically, set an escalating tax that makes it prohibitively expensive to produce products with certain known toxics, thereby effectively phasing-out said toxics by dates certain. This way the market has certainty, which in turn spurs investment in alternatives. Use 1/2 of the tax collected to mitigate toxic impacts (human or other), and the other 1/2 as grants/incentive/seed money for the study and development of non-toxic alternatives. In the unlikely event no alternative is developed for products not necessary to prevent or address health or safety emergencies, so be it.
J-TD-23	As a former employee of a small silicon valley machine shop, I've always questioned the use of toxic (perc) de-greasers. Incentives should be used to move industry towards non-toxic de-greasers.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
J-TD-24	<p>For the sake of full disclosure, I should note that I am a toxicologist employed by the Department of Pesticide Regulation, in the California Environmental Protection Agency. I submit the following ideas to be considered as options: Cal/EPA should develop a fact sheet on chemicals policy in the U.S. and post it on their GCI website to educate the general public.</p> <p>Cal/EPA should develop layperson information on common chemicals in common commercial products for the purpose of educating the public.</p> <p>Cal/EPA should engage in culturally appropriate outreach to consumers to help them make informed choices and move purchasing towards greener products. Media such as television commercials (featuring Arnold Schwarzenegger, perhaps), comic books, radio, could be utilized. Partnering with Hollywood would go a long way.</p> <p>Cal/EPA should develop guidance on what its citizens as individuals could do to move towards greener, sustainable living.</p> <p>Cal/EPA should work with the U.C. system to develop a green chemistry curriculum for all chemistry and engineering majors.</p> <p>Cal/EPA should work with other state agencies including DGS to develop information on green purchasing, and disseminate this information to counties and cities and to private sector businesses for their use.</p> <p>Responsible parties should be required to report new factual information regarding adverse health effects of their products or of the individual constituents of their products. This information could be reported to a centralized, publicly addressable database. The adverse effects reporting requirements for pesticides, as set forth in Section 6 (a) (2) of the Federal Insecticide, Rodenticide, and Fungicide Act, could be used as a starting point.</p> <p>Responsible parties should be required to identify the individual constituents of their products or, if that information was considered to be confidential business information, to provide the appropriate health information on their products.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
J-TD-25	<p>Options for the Green Chemistry Initiative</p> <p>The U.S. EPA has partnered with various stakeholders and industry groups as part of its “Design for the Environment” program (see: http://www.epa.gov/dfe/pubs/tools/ctsa/index.htm & http://www.epa.gov/dfe/pubs/). First, I suggest Cal EPA use, to the extent possible, any useful information already developed by the U.S. EPA through its Design for the Environment Program (why reinvent the wheel). Second, I suggest the Cal EPA look at several elements developed by the U.S. EPA regarding how a business should “design for the environment”. The U.S. EPA suggested businesses should:</p> <ul style="list-style-type: none"> • Evaluate the human health and environmental impacts of its processes and products. <p>-Although various incentives may be offered to support this activity, statute or regulation requiring this type of activity may be required.</p> <p>-One incentive could be some sort of “green” business award, and associated press releases from Cal EPA.</p> <ul style="list-style-type: none"> • Identify what information is needed to make human health and environmental decisions (e.g., hazard characteristics data and identification of “safer” alternatives). • Consider cross-media impacts and the benefits of substituting chemicals. • By reducing the use and release of toxic chemicals through the innovation of cleaner technologies that use safer chemicals. <p>-This is where a partnership between Cal EPA and the UC and/or CSUS systems may provide needed research support.</p> <p>-This is where incentives may also be helpful to encourage certain desired behaviors (e.g., tax incentives for research and development, statutory or regulatory requirements, awards for innovation, etc.)</p> <ul style="list-style-type: none"> • Implement pollution prevention, energy efficiency, and other resource conservation measures. • Make products that can be more readily reused, refurbished, remanufactured, or recycled. <p>-The EU’s WEEE Directive and accompanying RoHS Directive accomplish this by requiring electronics to essentially be designed with recycling/reuse in mind, and by requiring manufacturers to pay for end-of-life management.</p> <p>-The US EPA concluded that one of the primary problems with end-of-life management of stockpiled Ewaste is that it is difficult to recycle because it historically was not designed with recycling, reuse, or resource recovery in mind.</p> <ul style="list-style-type: none"> • Monitor the environmental impacts and costs associated with each product or process. <p>-This could be done by the Cal EPA and its BDOs once data on the chemicals being used and their respective potential impacts are collected.</p> <ul style="list-style-type: none"> • Recognize that although change can be rapid, in many cases a cycle of evaluation and continuous improvement is needed. <p>-Cal EPA can support this in the long term by partnering with UC and CSUS to incorporate “green chemistry” curricula in college engineering and chemistry courses.</p> <p>-Incentives may help.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY DESIGN (JOURNAL)	
Number	Full Comment
J-TD-26	<p>The State of California needs to collect information on usage of chemicals and work on methods for reducing the use of toxic substances. Clearly some other States have done more to address these issues and California needs to benefit from their experience if California is to develop a leadership role in Green Chemistry. The following programs need to be considered for adaptation in California:</p> <p>Massachusetts Toxic Use Reduction Act (TURA) passed in 1989 and amended in 2006. This act currently requires manufacturing companies using certain toxic chemicals above a threshold to file a report describing their use of the chemical and to develop a Toxics Use Reduction plan for each chemical. Although the companies are not required to implement the plans, the law has resulted in a reduction of toxic chemical use, chemical waste, and chemical emissions, saving industry millions of dollars and conferring significant health and environmental benefits.</p> <p>Oregon's Toxics Use and Hazardous Waste Reduction (TUHWR) Act, passed in 1989, also targets the reduction or elimination of toxic substances use and hazardous waste generation. In June 2005, a new law was passed that made significant changes to the TUHWR program. Under the current law large toxics users, as well as large and small quantity generators are required to develop a reduction plan and report completion of the plan. In addition, the business must also complete an "Implementation Summary" which reports how the plan implemented and describes the successes, challenges and future opportunities for waste reduction. Other legislation in Oregon includes an executive order introduced in 1999 called for the reduction of persistent, bioaccumulative, and toxic substances (PBTs) by using various approaches to determine the sources of PBTs in an attempt to eliminate their release by 2020.</p> <p>In 2000, the Oregon Department of Agriculture adopted an emergency rule that prohibited any use of pesticide products containing ten specific active ingredients identified as PBTs. In 1996, the city of Eugene passed a toxics right-to-know law requiring companies to keep an accounting of toxic chemicals and submit their accounting to the city, which posts them on a web site. Companies also pay a fee, based on volume.</p> <p>The New Jersey Pollution Prevention Act (1991) requires industry to draft plans that identify areas or procedures that could reduce or prevent the creation of environmental pollution. The New Jersey Worker and Community Right to Know Act of 1983 mandates that public and private employers make available hazard information for substances to which workers or communities could potentially be exposed. This act encourages the identification and implementation of techniques that minimize the need to use and generate hazardous substances in industrial activity.</p> <p>The Act requires facilities to develop Pollution Prevention Plans to show that there are business opportunities in pollution prevention, but it does not mandate that facilities implement any of them. In addition, Plan Summaries and Plan Progress Reports must be submitted.</p>

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (JOURNAL)	
Number	Full Comment
J-TA-1	<p>Please don't lose sight of the environmental advantages provided by plastics. These include ... a less-hospitable surface for bacterial growth (vs paper bags, wood), ... less accidental injury (vs glass, metal), ... lower energy consumption from start to finish (especially PVC, which uses less energy in manufacture and use than most all other materials), and ... potential for energy recovery either via incineration-to-power or recycling that replaces new material manufacture (the most meaningful form of recycling).</p> <p>Please also don't get caught by pseudoscience that talks about harmful chemicals as if "chemicals" were a dirty word (we are all made up of chemicals), or a passion for "natural" as sacred, as if man-made/synthetic/processed were evil. The words are grossly abused, as some of the most toxic substances are "natural" (e.g., snake venom, tobacco) and many "chemicals" make our lives safer and healthier (safe drinking and swimming water, synthetic insulin, and countless household and medicinal "chemicals").</p> <p>Lastly, don't lose sight of an old medical maxim, "the dose makes the poison." It's how much that counts, so that if someone says "that contains "xyz" we have to know how much xyz, and what the effects of that much might be. There are certainly substances that should be minimized and avoided, and in fact California is a leader in raising the nation's consciousness to this effect. Please continue that leadership with sound scientific and medical bases, and don't be swayed by people with pre-set agendas, often well-meaning but nonetheless wrong.</p> <p>Allan L. Griff, Consulting Engineer</p>
J-TA-2	<p>I am an alternative healthcare practitioner-Please get with the Union of Concerned Scientists and discuss these issues- They have much to say and have great ideas. Go to Real Goods.com in Hopland, CA for a totally green approach on every level of life. Educate the individual as to what items they use daily are toxic and penalize the companies for selling them... Dupont, Monsanto- all the chemical companies producing Round up draino-etc. There is science available medically that proves illness is caused by the chemicals such as those in our water supply etc. on the lawns our kids and animals play on. Reeducate the companies that green is economically sound for the future of their company and the planet. Al Gore talk to him...The time is now to go back to basic natural chemical combinations bakingsoda and lemon to clean countertops etc. We are killing ourselves with too many chemicals in combination. Sincerely A</p>
J-TA-3	<p>Hi, I hope the first step is to properly define "toxic" and "non-toxic" and that we will use rational scientific-based information to create these definitions. I hear these words used incorrectly all the time, especially by those demanding that only non-toxic ingredients be used or by those selling products that supposedly "contain no chemicals" and are completely "non-toxic". I wonder how they made these "chemical free" products, since everything, except light and electricity, is a chemical? This is just a bunch of nonsense and "non-toxic" is just a marketing word with no set scientific definition. Other than food, what isn't toxic to some degree? Salt water and rubbing alcohol are both "toxic". Are we going to ban them next? We need to get past the "Marketing" of Green and get serious about the subject. Personally I'm tired of hearing irresponsible marketers and activist use these incorrectly to frighten the public and law makers- suggesting that "non-toxic" should be the goal and anything less is not good enough. Unfortunately, this is usually just rhetoric... and not based on anything factual or scientific. We've got to stop this type of dangerous thinking before we can make improvements. In my opinion, those who use irrational fear and paranoia to push forward their own agendas are the bigger problem. We need scientific facts to solve these issues, not more "spin".</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (JOURNAL)	
Number	Full Comment
J-TA-4	<p>The Silicon Valley Leadership Group, which represents 210 employers in Silicon Valley, would like to offer our perspectives mainly as that of chemical end-users, especially in respect to R&D efforts that often use small quantities of tightly managed chemicals to drive technology breakthroughs. We propose the following ideas under this topic:</p> <ul style="list-style-type: none"> • Improve import standards. Many of the hazards come from incoming products that are manufactured offshore in regions without comparable chemicals policies. • Establish corporate and manufacturing codes of conduct. Instigate appropriate due diligence for products and for consumers. • Develop Best Practices for supply chain management. Look not only at what goes out the door, but what comes in. Better supply chain management would help us determine how toxic chemicals get into articles. • Manufacturers should demand full disclosure from their suppliers. • Establish product and process benchmarks. Distinguish between process chemicals and product chemicals. • Help establish a product safety/product liability organization to determine a check list and review products for safety. For example, we have CPSC for product safety and UL for fire/electrical safety; we could do the same for chemical safety.
J-TA-5	<p>Governor Schwarzenegger's Executive Order S-20-04, which was signed in December 2004, calls for the State of California to reduce energy consumption in state buildings by 20 percent by 2015. Reaching this goal has required benchmarking energy use in state buildings as well as a mandate that new buildings and major renovations larger than 10,000 square feet are certified Silver or higher according to the Leadership in Energy & Environmental Design [LEED] Green Building Rating System, which advances energy and material efficiency and sustainability. Since the Governor's "green building initiative" conserves resources, reduces greenhouse gas emissions and reduces operating costs, why not extend his initiative to the private sector?</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (JOURNAL)	
Number	Full Comment
J-TA-6	<p>I agree strongly with Frank Teng's comments here. I also agree with those various comments discussing how we need far more serious research with more modern methods to address our broad ignorance about the effects of toxins as measured in a conventional manner. So many toxins in the marketplace haven't been studied at all--part of the gaps in chemical industry enforcement which need filling, as another person mentioned. We know so little about toxins at low levels in longer-term exposures, or the synergistic effects of combinations of toxins, or what happens when you recycle or burn or process materials mechanically or chemically. Then there's what happens to it in the acid of a seagull's stomach, or that of a fish. Drop bits in the ocean accidentally, and then any toxins in them can get eaten by people, second-hand.</p> <p>I anticipate serious regulatory and legislative challenges just to achieve the funding required for the beginnings of adequate research. This effort may also be competing with efforts to increase funding for basic research on global warming. I anticipate that good research-question design will try hard to work on both problems, or be complementary to work on that problem. Good product design in future will help mitigate problems in that arena as well. That's exciting to me.</p> <p>A lot of fast-moving educational efforts by really credible lobbyists will be required to persuade both legislators and CFOs that worthwhile projects will come out of the risky expenses involved. For example, there's the risks of digging out all kinds of expensive liabilities. Who knows where basic toxin research might lead, or where expensive fingers might be pointed? Many anti-tax and anti-regulatory groups will insist that it's far easier to remain head-in-sand, pretending there's just nothing to worry about. Some industry groups will not want another set of regulators staring at their records. Some social justice groups will be supportive, but others will be deeply offended at spending money anywhere that isn't immediate, basic support of people in trouble. Some watchdog groups will question the integrity of various proposed research institutions.</p> <p>Efforts like this will need lobbyists with practiced answers for all these groups. I think that the most exciting aspects of the cradle-to-cradle design ideas are the ways in which these groups can be stimulated to join forces and help out to achieve their ends, along with broader goals in cradle-to-cradle projects. For instance, it could mean proving lower building running costs for anti-tax groups, mitigation of air and ground pollution in badly-impacted neighborhoods for social justice groups, better production line economics and lower risk production for manufacturing managers, and so on.</p> <p>It's exciting to see examples out there where this kind of manufacturing has been achieved.</p> <p>Basic research funding doesn't have to be based entirely in the legislature, or codified in government regulatory purposes. Getting it done piecemeal by industries who have a stake in the results is one way to get it done at all, but that may or may not generate an overarching set of standard practices and useful statistics. In any case, both public and private sectors have to show good arguments to justify spending money on such research.</p> <p>It has to be presented by people they'll bother to listen to.</p> <p>I find it exciting that really credible folks are talking about it from different sectors.</p>
J-TA-7	<p>Mike Wilson made an interesting comment at the 6/27/07 Green Chemistry Initiative Stakeholder Meeting that caught my attention. He commented that it is as if we are holding a box being full of many unconnected puzzle pieces. This certainly is an accurate description of the many disconnected pieces of information from many diverse viewpoints. However, some of the pieces are connected and have been connected for some time. The most important pieces of information are not individual chemicals (whether assessed by hazard or risk), they are the longstanding operations of specific extractive, processing and manufacturing industries that generate most of the chemical hazards. In addition to looking at HPV chemicals, POPs, endocrine disruptors, etc. we should be looking at specific industry sectors and industries within sectors that generate the largest volume and most toxic products/wastes: green production and processing perhaps?</p> <p>Although I am trained in chemistry, for years I have been frustrated with the futility and actual distortion of taking a "periodic table approach" to the work we do at DTSC. An approach based solely on the toxicity of individual chemicals is not very meaningful or effective in the work we do at DTSC with multi-chemical wastestreams. In my opinion, the history and organization of the overall chemical industry production process (extraction, processing, products and wastes) holds important information that has tended to be neglected in favor of a pure science/"chemicals" approach. I hope that someday this will change.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (JOURNAL)	
Number	Full Comment
J-TA-8	Oregon does or did add \$100 to the cost of all cars. When the car's useful life ended, its body was worth \$100. We could add a similar fee to cosmetics, batteries, medicines etc. Maybe then people would litter less and not add unused cleaning fluids to our sewage sludge.
J-TA-9	<p>I think we must not forget the children who at a young age have a deep connection to the earth and land and really do care. As a children's author I travel to schools and am amazed when I see children as young as four years able to relate to concepts of recycling and landfills when given the information in terms that they can understand.</p> <p>I think that reaching out to the children is the key because they will turn to their parents with excitement about helping and motivate the adult to take notice. When you take children to a landfill and show them the exciting things going on there it is science and chemistry and helps them to see and understand energy , recycling and pollution. Using children's stories on these topics has brought understanding to thousands as I have toured the USA and Africa.</p> <p>Keep it simple and they will understand,relate and then want to help to make a difference.</p>
J-TA-10	<p>Fortunately there is a wealth of publicly available information for purchasing and sustainability managers to make decisions that reduce the environmental hazards, health hazards, and even cost of chemical inventories. The problem is the shear volume and disparate sources of the information.</p> <p>Dolphin Software (www.dolphinsafesource.com) provides tools that collect and analyze this information to display it in an easy to understand picture that allows purchasers to choose products and customers that fit their standards.</p> <p>In other words, the state of California and private industry can get a real-time view of their chemical inventory hazards and act state-wide to reduce both cost and risk.</p> <p>The tools are out there; we just need the will to use them.</p>

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (JOURNAL)	
Number	Full Comment
J-TA-11	<p>The Green Chemistry Initiative held a public stakeholder meeting on August 17th in San Jose. The goal of this meeting was to gather input that will provide recommendations for developing a consistent means for evaluating risk, reducing exposure, encouraging less-toxic industrial processes and identifying safer alternatives. The comments below were received as a direct result of the breakout session on toxics in products by accident. If you have any thoughts or suggestions on the ideas shown below, please respond and share your views.</p> <ul style="list-style-type: none"> • Supply chain management. • Government responsibility for international cooperation on imports and exports of products. • Penalties and citations. • Consider exposure not just toxicity. • Move beyond risk assessment. • Best practices for supply chain manufactures. • Mechanism for improving flow of information through manufacturing process. • More flexibility in permitting. • Disclosure of content confidential STMTS-Government. • Randomize testing by government. • Enforcement-retailer and upstream. • Corp. responsibility so government not solely responsibility. • Government imposed change US. Consumer market drivers. • 1-4 Dioxane, for example. • How often does this happen? (can be criminal element) • How to know what's in products from abroad. • Rigorous internal process controls • Bigger companies can do this, but what of mom/pop business. • Retailers hold companies to certain standards. • Everyone needs to play a role. Mom/pop retailers as well in process. Way to have access to information. Plus need sense of responsibility. Don't have background to ask right questions. Need education on this. Don't have time, staff. • Build knowledge data base. Need to be held to minimal level. • Rating system on manufacturers information-but not good/bad. • Whose responsibility for data. Need qualified people, or things listed may not actually be a problem. • Rely on suppliers for information, now want expert opinions. • Uncomfortable with "good" "bad" list. • How about a scorecard? Things to declare. List criteria user decides. • Need to agree on criteria. • Depends on application. • Take worker exposure into account. • Prioritize on risk and exposure • Look for current + next generation technologies to help with product recalls and reveal, e.g. toxic information in products. • Organization needed to ID.

Conversation With California Forum And Journal Comments
Green Chemistry Initiative

TOXIC BY ACCIDENT (JOURNAL)	
Number	Full Comment
	<ul style="list-style-type: none"> • Require testing prior to reuse or equivalent information. • Enforcement (spot check-market place) (assuming product standard with penalties). • Relook at what's "toxic" to include emerging containment effects in endocrine disruption. • Evaluate synergistic effects of chemicals in products. • Recommend manufactured require certified by suppliers. *Third party testing *Third party auditing • Chemicals as tools to accomplish process should be greener. • Precursors/raw materials should be qa/qc'd. • "Toxics release" clarify and define. • Greater supply chain stewardship + scrutiny clarify location of liability in the whole chain of manufacture + sale. • Assistance to small manufactures to improve/safeguard quality of inputs, ex. Pooling resources to facilitate QA/QC. • ID areas where standards/regs can be strengthened. • Voluntary efforts to improve quality of inputs. • Expand testing of products and food. • Company accountability for out sourcing. • Improved enforcement. • Strengthening international trade agreements. • Technology exchanges with companies in other countries that mass produce products to help identify less toxic alternatives. • Improve consumer visibility of products. • Product liability consequences. • Leveraging supply chain consequences. • Encouraging media publicity and engagement. • Establish academic programs in product stewardship. Promulgate cradle-to-cradle design curriculum into multiple disciplines (from a low level i.e. high school) • Supply chain transparency enforcement.

**Conversation With California Forum And Journal Comments
Green Chemistry Initiative**

TOXIC BY ACCIDENT (JOURNAL)	
Number	Full Comment
J-TA-12	<p>For the sake of full disclosure, I should note that I am a toxicologist employed by the Department of Pesticide Regulation, in the California Environmental Protection Agency. I submit the following ideas to be considered as options: Cal/EPA should develop a fact sheet on chemicals policy in the U.S. and post it on their GCI website to educate the general public.</p> <p>Cal/EPA should develop layperson information on common chemicals in common commercial products for the purpose of educating the public.</p> <p>Cal/EPA should engage in culturally appropriate outreach to consumers to help them make informed choices and move purchasing towards greener products. Media such as television commercials (featuring Arnold Schwarzenegger, perhaps), comic books, radio, could be utilized. Partnering with Hollywood would go a long way.</p> <p>Cal/EPA should develop guidance on what its citizens as individuals could do to move towards greener, sustainable living.</p> <p>Cal/EPA should work with the U.C. system to develop a green chemistry curriculum for all chemistry and engineering majors.</p> <p>Cal/EPA should work with other state agencies including DGS to develop information on green purchasing, and disseminate this information to counties and cities and to private sector businesses for their use.</p> <p>Responsible parties should be required to report new factual information regarding adverse health effects of their products or of the individual constituents of their products. This information could be reported to a centralized, publicly addressable database. The adverse effects reporting requirements for pesticides, as set forth in Section 6 (a) (2) of the Federal Insecticide, Rodenticide, and Fungicide Act, could be used as a starting point.</p> <p>Responsible parties should be required to identify the individual constituents of their products or, if that information was considered to be confidential business information, to provide the appropriate health information on their products.</p>