15-DAY NOTICE
(REVISED PROPOSED REGULATIONS TEXT, 6/27/13 THROUGH 7/11/13)
LIST OF PUBLIC COMMENTERS

LETTER NUMBER	NAME OF ENTITY	DATE RECEIVED	LATE
1	ECS Refining	7/11/13	
2	First Solar, Inc.	7/11/13	
3	Paul Hastings LLP	7/11/13	
4	Soitec Solar Industries LLC	7/11/13	

ECS
REFINING

July 11, 2013

VIA ELECTRONIC MAIL
Department of Toxic Substances Control
Solar Panel Regulation Development
P.O. Box 806
Sacramento, CA 95812

Re: Comments on the "PROPOSED STANDARDS FOR THE MANAGEMENT OF HAZARDOUS WASTE SOLAR MODULES"

Department Reference Number R-2010-01

To Whom It May Concern:

ECS Refining is an electronic waste recycling company and permitted treatment, storage and disposal facility under the standardized permit program. We have reviewed the proposed regulations designed to codify management of photovoltaic modules under the Department of Toxic Substances Control's regulatory scheme and offer the following comments.

The proposed regulations appear to offer two management tracks for recycling of photovoltaic modules (PV modules). The first is that the modules may be recycled through a program administered by a PV module vendor (or designee) and the second is to classify the PV modules as a universal waste provided certain conditions are met. PV Modules handled under the vendor reclamation programs are not classified as universal waste and are presumably hazardous wastes eligible to be managed under the recyclable material provisions of 22 CCR 66261.6(a)(3)(D).

This dual classification system would require different labeling and transportation requirements based solely on the entity managing the recycling of the PV modules, not on the inherent properties of the PV modules. This will be difficult to manage and to enforce, since it is likely that a company that handles PV modules for recycling will receive the modules from vendor reclamation programs as well as other sources. There are already too many examples in the California hazardous waste regulations that require identical materials to be labeled differently depending upon their origin (for example, printed circuit boards that are scrap metal and those that are 'Residual Printed Circuit Boards'). This is illogical and confusing for the regulated community.

705 Reed Street
Santa Clara, CA 95050
Phone: (408) 200-7000
Fax: (408) 988-5154

The draft regulations state that PV modules intended for reclamation under a PV module vendor reclamation program must be delivered to a reclamation facility within the United States as designated by the PV module vendor [22 CCR §66261.6(a)(8)(H)]. There are no commercial reclamation facilities in the United States currently accepting PV modules. The Department may have been led to believe that one exists in Arizona, but at the moment that facility is not actually recycling PV modules on a commercial basis. If the Department enacts this regulation as written, the effect will be to direct PV modules outside of California to recyclers that claim to have a recycling process but haven't necessarily fully developed it into a commercial operation.

ECS Refining proposes that the Department regulate PV modules for recycling as universal waste and allow universal waste handlers to prepare the panels for eventual recovery at a primary or secondary smelter by shredding or other required sizing techniques. Reclamation using a primary or secondary smelter should be allowed due to the similarity of the smelting processes; both types of smelters must comply with air pollution controls and residuals of the reclamation process must be properly classified and managed. In addition, allowing reclamation at secondary smelters will allow these materials to be reclaimed in the United States.

We appreciate the opportunity to comment on this draft regulation. ECS Refining urges the Department to consider the consequences of this proposed regulation on California recycling businesses. As written, this regulation will not allow California businesses to provide cost-effective recycling solutions for PV modules, but will incentivize businesses to recycle PV modules outside of California. Moreover, the regulation does not take into account the realities of metal smelting and recycling.

Sincerely,

Beverly Pester Kennedy
Environmental Health and Safety Manager
Phone (408) 768-4966
E-mail bkennedy@ecsrefining.com

July 11, 2013

Via Email

Ms. Manpreet Singh, Regulations Coordinator
Department of Toxic Substances Control
Regulations Section MS 23A
PO Box 806
Sacramento, CA 95812-0806

Re: Comments on June 27, 2013 Revised Standards for the Management of Hazardous Waste Solar Modules rulemaking

Dear Ms. Singh:

First Solar Inc. ("Frist Solar") is submitting the following comments regarding the Revised Standards for the Management of Hazardous Waste Solar Modules rulemaking (the "Revised Regulations") relased for public comment on June 27, 2013.

As an initial comment, First Solar believes that the Revised Regulations represent an important step towards the development of a logical and efficient waste photovoltaic module management scheme. The Revised Regulations take into account many of the issues raised by industry stakeholders over the course of the regulatory process. Several key issues still remain, however, and should be addressed by DTSC prior to finalization of the regulations.

To assist DTSC, First Solar has included proposed regulatory language in black-outlined boxes after each comment. The base text is the language proposed by DTSC on June 27. All revisions are in DTSC's preferred underline (underline) and strikeout (~~strikeout~~) format. First Solar's comments are as follows:

1. Physically damaged PV modules should be eligible for management under the conditional exemption and the universal waste management scheme.

   In two places, the Revised Regulations exclude from the definition of PV modules "physically-damaged, deteriorated, or altered PV modules."[1] This exclusion is extremely broad and, lacking limiting text, acts to exclude from regulation any PV module that is physically damaged in any way. Which means that if a PV module becomes cracked, chipped, or otherwise damaged at all, it will not qualify for management under the

[1] *See* Section 66260.10; Section 66273.9.

conditional exemption or the universal waste management scheme. Instead, the generator will be required to manage the PV module as a hazardous waste.

It is inefficient and illogical to require generators to treat physically damaged modules differently from undamaged modules. Cracked modules often continue to function as designed and are no less recyclable than intact modules. Furthermore, the structure and inherent stability of PV modules means that cracked and broken modules are no more likely to release hazardous constituents to the environment than intact modules. As noted by industry stakeholders in their August 2010 comments, PV modules are fundamentally different from other types of wastes – such as CRTs – that will release hazardous constituents to the environment if broken. DTSC even appears to have acknowledged that fact in defining PV modules to include "cracked or otherwise damaged" modules.[2] DTSC should amend the Revised Regulations so that physically damaged modules remain eligible for management under the conditional exemption and universal waste management scheme unless they are so physically damaged that they are unrecognizable as PV Modules.

We therefore recommend that DTSC amend Section 66260.10 and Section 66273.9 of the Revised Regulations as follow:

> "Solar module" Photovoltaic (PV) Module"
>
> . . .
>
> (b) Does not mean:
> (1) physically-damaged, -deteriorated, or -altered PV modules, including ~~(2)~~ fractured or fragmented portions of a PV module, that are no longer recognizable as a PV module,
> (2~~3~~) solar-powered electronic devices that have one or more photovoltaic cells incorporated into their structures.

2. Regulated entities should not be prohibited from breaking modules.

Section 66273.33(d) of the Revised Regulations requires universal waste handlers to

---

[2] *Id.* Note that the inclusion of "cracked or otherwise damaged" modules in the PV Module definition directly conflicts with DTSC's exclusion of "physically-damaged, -deteriorated, or –altered PC modules." DTSC cannot both include and exclude damaged modules in the same definition.

contain PV modules "in a manner that prevents breakage" and to place in a container any "PV module that is accidentally or unintentionally broken." Vendors operating under the conditional exemption must similarly manage PV modules "in a manner that prevents breakage."[3] As described in Comment #1 above, there is no need for DTSC to focus on avoiding PV module breakage. Broken modules remain as recyclable, and stable, as intact modules. And in decommissioning massive arrays, vendors may find it practical to intentionally break modules. DTSC should not prevent vendors from doing so provided that vendors contain the broken modules in a manner that prevents the release of fragments of the modules or hazardous constituents contained in the module to the environment.

3. We therefore recommend that DTSC revise Section 66273.33(d) of the Revised Regulations as follows:

> (d) Solar PV modules.
> (1) A universal waste handler of PV modules manage solar PV modules in a way that prevents releases of any universal waste or component of a universal waste to the environment under reasonably foreseeable conditions, as follows:
> (A) A universal waste handler shall contain any PV module in a manner that prevents ~~breakage and~~ the release of hazardous ~~components~~ constituents to the environment under reasonably foreseeable conditions. ~~If a container is used, such a container shall prevent leakage, spillage, or damage that could cause leakage of hazardous components under reasonably foreseeable conditions.~~
> (B) Intact PV modules or removed intact PV module components that are placed in shipping boxes and/or secured by stretch-film on a pallet shall be deemed to comply with subsection (d)(1)(A~~B~~)~~1.a~~. of this section.
> (C) A universal waste handler shall ~~immediately clean up and~~ place in a container any PV module that is ~~accidentally or unintentionally~~ broken ~~and which may be expected to cause a release of hazardous constituents to the environment under reasonably foreseeable conditions~~. The container shall be structurally sound, compatible with the contents of the PV modules, and shall prevent releases of ~~hazardous components~~ fragments of the PV modules to the environment under reasonably foreseeable conditions.

We further recommend that DTSC revise Section 66261.6(a)(8)(A) of the Revised Regulations as follows:

---

[3] *See* Section 66261.6(a)(8)(A).

> (8)(A) PV modules shall be managed in a manner that prevents ~~breakage and prevents~~ releases of hazardous constituents from any PV modules ~~or of any hazardous component of a PV module~~ to the environment under reasonably foreseeable conditions pursuant to the requirements of this section.

4. Vendors managing "Intact PV Modules" under the conditional exemption should be able to satisfy handling requirements by placing the modules in shipping containers and/or securing them by stretch-film on a pallet.

   DTSC defines "Intact PV Modules" in Section 66260.10 of the conditional exemption but does not thereafter utilize the definition within the operative text of the conditional exemption. First Solar believes that it makes sense to apply the definition in the same way it is utilized in the universal waste management scheme – to create a bright-line containment requirement for intact PV modules. Under the universal waste management scheme, intact PV modules satisfy all containment requirements if they are placed in shipping containers and/or are secured by stretch-film to pallets. This bright-line rule gives regulatory certainty to handlers of waste PV modules and logically recognizes that intact PV modules require less containment than broken modules. Vendors managing PV modules under the conditional exemption should benefit from the same treatment of intact modules.

   We therefore recommend that DTSC revise Section 66261.6(a)(8)(A) of the Revised Regulations as follows:[4]

   > (8)(A) PV modules shall be managed in a manner that prevents ~~breakage and prevents~~ releases of hazardous constituents from any PV modules ~~or of any hazardous component of a PV module~~ to the environment under reasonably foreseeable conditions pursuant to the requirements of this section. Intact PV modules or removed intact PV module components that are placed in shipping boxes and/or secured by stretch-film on a pallet shall be deemed to comply with this subsection.

5. DTSC should make clear that Removed Intact PV Module Components may be managed under the PV Module conditional exemption at Section 66261.6(a)(3)(D), as scrap metal under Section 66261.6(a)(B), or as recycled materials under Section 66261.6(a)(3)(A).

---

[4] Note: Language proposed in Comment #3 augments language proposed in Comment #2.

When entities remove components from PV modules, they should have the flexibility to manage those modules in an efficient and practical manner. Depending on the content of the component, it may make sense to manage the components under any one of three regulatory exemptions found at Section 66261.6 of the revised regulations: The "recycled materials" exemption, the "scrap metal" exemption, or the "PV module" exemption.[5] We believe that DTSC sought to allow this flexibility, by allowing a vendor to manage "any materials generated through manual disassembly of PV modules pursuant to all applicable requirements of this division" under Section 66261.6(a)(8)(f)(2). That provision is somewhat vague, however, and would benefit from additional clarity.

We therefore recommend that DTSC revise Section 66261.6(a)(8)(F)(2) of the Revised Regulations as follows:

> 2. The PV module vendor shall manage any removed intact ~~materials generated through manual disassembly of~~ PV modules component pursuant to ~~all applicable requirements of this division~~ either Section 66261.6(a)(3)(A), 66261.6(a)(3)(B), or 66261.6(a)(3)(D) of this division, as applicable.

6. The Revised Regulations should facilitate, not prohibit, the offsite aggregation of waste modules that are delivered to a reclamation facility within one year of generation.

Under the conditional exemption, a vendor transporting waste PV modules may not "deliver PV modules to a place other than to a reclamation facility within the United States and its territories." This restriction prevents vendors from aggregating waste PV modules at an off-site aggregation facility prior to transport, which could increase the cost of vendor compliance with the conditional exemption. So long as off-site aggregation facilities are managed by vendors and PV modules are delivered to a reclamation facility within one year of the date they become wastes, there is no reason for DTSC to ban off-site aggregation of PV modules.

We therefore recommend that DTSC revise Section 66261.6(a)(8)(H) of the Revised Regulations as follows:

---

[5] *See* Section 66261.6(a)(3)(A), (B), and (D), respectively.

(H) A person who transports ~~of~~ PV modules as part of a program administered by a PV module vendor may transport PV modules to or between any facility operated by the PV module vendor or to ~~shall not deliver PV modules to a place other than to~~ a reclamation facility within the United States and its territories designated by the PV module vendor, provided, however, that~~.~~ PV modules must be delivered to the designated reclamation facility within one year from the date the PV modules became a waste, as defined in subsection (c) of section 66273.7.1 of this division.

* * *

We appreciate you taking the time to review these comments. We are happy to discuss them with you at your convenience. If you have any questions, please contact me at mgaramone@firstsolar.com or 908-809-4127.

Respectfully Submitted,

Matthew Garamone
Corporate Environmental Director and Senior Counsel – Environmental, Health & Safety
First Solar, Inc.

cc: Ron Ohta, DTSC
Karl Palmer, DTSC
Andre Algazi, DTSC

PAUL
HASTINGS

1(916) 552-2881
roberthoffman@paulhastings.com

July 11, 2013 90270.00002

VIA E-MAIL: REGS@DTSC.CA.GOV

Ms. Manpreet Singh, Regulations Coordinator
Department of Toxic Substances Control
Regulations Section

Re: June 27, 2013 Revised Standards for Management of Photovoltaic Modules
Reference Number: R-2010-01

Dear Ms. Singh:

On behalf of SolarCity, we offer comments on DTSC's revised Standards for Management of Hazardous Waste Solar Modules (the "15-Day Revisions") released for public comment on June 27, 2013. SolarCity believes that the 15-Day Revisions represent an improvement in the subject DTSC rulemaking. Several key issues still remain, however, and should be addressed by DTSC prior to submitting the regulations to the Office of Administrative Law. SolarCity is providing comments and specific suggested text changes, which are shown in underline and strikeout format using the language proposed by DTSC on June 27.

1. The definition of PV module vendor

The definition of PV module vendor should be amended to include a reference to "installers." As written, the definition could be construed to exclude SolarCity from participating as a vendor. SolarCity is California's leading full service solar power provider and has provided clean energy services, including installation of residential and non-residential solar PV systems, to more than 20,000 California customers. Failure to include installers would be a fatal flaw in the regulations. We respectfully suggest the following additional change:

"PV module" vendor means the manufacturer, producer, marketer, ~~or~~ distributor or installer of PV modules, or a third party entity acting on behalf of such manufacturer, producer, marketer, ~~or~~ distributor or installer, located within the United States and its territories, who administers a PV module reclamation program and who accepts (for reclamation) one or more PV modules that are subject to the conditions for the exemption in section 66261.6 of chapter 11 of this division.

2. Offsite aggregation of PV modules

Under proposed section 66261.6(a)(8)(H), a vendor transporting waste PV modules may not "deliver PV modules to a place other than to a reclamation facility". This restriction would prevent vendors from aggregating waste PV modules at an off-site aggregation location prior to transport. This would unnecessarily increase the cost of vendor reclamation programs. SolarCity is considering safely and efficiently aggregating at locations under its control or under the control of a contractor. Properly managed aggregation locations by vendors are an appropriate feature of a cost effective recycling and reclamation program. The proposed restriction on off-site aggregation locations is not reasonable or necessary.

We respectfully request that DTSC revise Section 66261.6(a)(8)(H) as follows:

(H) A person who transports ~~of~~ PV modules as part of a program administered by a PV module vendor may transport PV modules to or between any facility operated by the PV module vendor or to ~~shall not deliver PV modules to a place other than to~~ a reclamation facility within the United States and its territories designated by the PV module vendor, provided, however, that~~.~~ PV modules must be delivered to the designated reclamation facility within one year from the date the PV modules became a waste, as defined in subsection (c) of section 66273.7.1 of this division.

3. Damaged PV module handling requirements

The 15-Day Revisions exclude from the definition of PV modules "physically-damaged, deteriorated, or altered PV modules."[1] This restriction is overly broad and will include any PV module that is physically damaged in any way. It is unnecessary to exclude all physically damaged modules. PV modules that are only nominally damaged do not pose any risk to public health or the environment and will not release hazardous constituents. DTSC should amend the 15-Day Revisions to allow physically damaged modules to be managed under the conditional exemption and universal waste management scheme unless they pose a risk.

One way that DTSC could address this concern would be to revise Section 66260.10 and Section 66273.9 of the 15-Day Revisions as follows: "Photovoltaic (PV) Module

. . .

(b) Does not mean:
(1) physically-damaged, -deteriorated, or -altered PV modules, including ~~(2)~~ fractured or fragmented portions of a PV module, that are no longer recognizable as a PV module, or that are otherwise releasing components or hazardous constituents into the environment, or
(2~~3~~) solar-powered electronic devices that have one or more photovoltaic cells incorporated into their structures."

4. Management of Removed Intact PV Module Components

Under the 15-Day Revisions, Vendors have the flexibility to manage PV modules and components under the "recycled materials" exemption, the "scrap metal" exemption, or the "PV module" exemption in Section 66261.6(a)(3)(A), (B), and (D), respectively. Proposed Section 66261.6(a)(8)(f)(2) states that a vendor may manage "any materials generated through manual disassembly of PV modules pursuant to all applicable requirements of this division." The proposed rules should be more specific and clear.

We respectfully request that DTSC revise Section 66261.6(a)(8)(F)(2) as follows:

2. The PV module vendor shall manage any removed intact ~~materials generated through manual disassembly of~~ PV modules component pursuant to ~~all applicable requirements of this division either~~ Section 66261.6(a)(3)(A), Section 66261.6(a)(3)(B), or Section 66261.6(a)(3)(D), as applicable.

[1] *See* Section 66260.10; Section 66273.9.

Sincerely,

Robert P. Hoffman
for SolarCity

RPH:jld

cc: Rick Brausch, DTSC rbrausch@dtsc.ca.gov
Karl Palmer, DTSC kpalmer@dtsc.ca.gov
Andre Algazi, DTSC aalgazi@dtsc.ca.gov
Ron Ohta, DTSC Ronald.Ohta@dtsc.ca.gov
Sanjay Ranchod, SolarCity sranchod@solarcity.com

LEGAL_US_W # 75662103.1

Soitec Solar Industries LLC
16550 Via Esprillo
San Diego, CA 92127 (USA)
T. 858-746-9000
karlfriedrich.HAARBURGER@soitec.com
www.soitec.com

July 11, 2013

VIA ELECTRONIC MAIL
(regs@dtsc.ca.gov)

Ms. Manpreet Singh, Regulations Coordinator
Department of Toxic Substances Control
Regulations Section, MS 23A
P.O. Box 806
Sacramento, CA 95812-0806

RE: Comment on the Proposed "Standards for Management of Hazardous Waste Solar Modules," DTSC Ref. No. R-2010-01; OAL Notice File No. Z-2012-0802-01

Dear Ms. Singh:

Soitec Solar Industries LLC (Soitec) offers the following comments on the Department of Toxic Substance Control's (Department) Proposed "Standards for Management of Hazardous Waste Solar Modules," open for public comment from June 27, 2013 to July 11, 2013.

I. SOITEC'S CONCENTRATED PHOTOVOLTAIC (CPV) TECHNOLOGY DIFFERS FROM PHOTOVOLTAIC (PV) TECHNOLOGY

Soitec is a world leader in manufacturing revolutionary semiconductor materials for the energy industry. This expertise led to Soitec's development of innovative concentrated photovoltaic (CPV) technology, which uses optimized multi-junction solar cells in which different types of solar cells are stacked on top of one another, combined with a magnifying Fresnel lens and dual-axis tracking system, to concentrate the sun's waves to achieve high solar efficiencies. *See* Figure 1, Soitec CPV Solar Cell; *see also* http://www.soitec.com/en/technologies/concentrix/ (a short video is embedded in the webpage, which graphically renders Soitec's CPV module technology); Figure 2, Soitec CPV Module.

Each solar cell type is designed to convert a certain range of the solar spectrum: short wave radiation, medium wave radiation and infrared. The energy yield and the potential of these high-efficiency cells are enormous. In the laboratory tests, efficiencies of more than 41% have been achieved. This is almost double the efficiency of conventional PV solar cells.

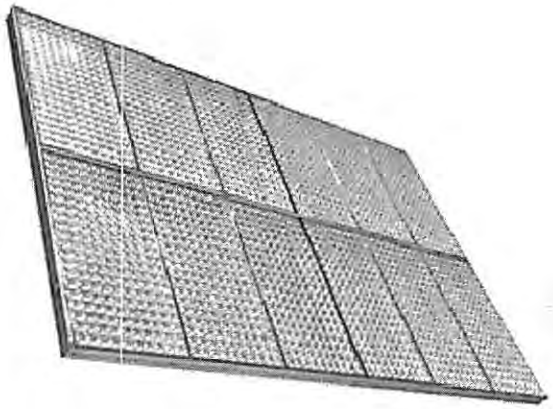
Soitec's CPV modules use Fresnel lenses to concentrate sunlight 500 times and focus it onto the small, highly efficient multi-junction solar cells. By using concentrating optics to focus the sunlight on these multi-junction solar cells, it is possible to minimize the amount of semiconductor material needed to generate solar energy down to a small fraction, using solar cells of only a few square millimeters. This principle enables the manufacturing of CPV modules that are both highly efficient and very low in heavy metal concentrations when compared to traditional PV modules.

For example, the solar cells used in each CPV solar cell are very small (7 mm^2 per piece). In comparison, the weight of a CX-M500 CPV Module is 210 kg, of which the solar cells are merely 0.017 kg (or less than 0.01%). Figure 1, below, graphically illustrates the Fresnel lens, focusing sunlight onto the solar cell, of which a very small portion is the multi-junction solar cell.

Figure 1. Soitec CPV Solar Cell

CPV modules are made with different materials than PV modules, including less heavy metals. Unlike the PV modules described in the Department's Initial Statement of Reasons (ISOR) for the current rulemaking, Soitec CPV modules consist of an aluminum frame with numerous tiny silicon solar cells implanted on a bottom plate in the frame, overlaid with concentrating optics to focus the sun's rays. *See* ISOR at 7 (Oct. 2012). *See* Figure 2, below.

Figure 2. Soitec CPV Module



CPV technology requires the use of a dual-axis tracking system to ensure that concentrated sunlight remains focused directly on the solar cells with a high degree of precision throughout the day, delivering constant power output. A proprietary application and algorithm position the tracker. Astronomical positioning is used and DC power output is monitored to calculate the next optimum position for maximum power generation. *See* Figure 3, below.

Figure 3. Soitec CPV Module Tracking System

In October 2012, Soitec's CPV modules were analyzed for heavy metals pursuant to the procedures described in Title 22, CCR § 66265.13, for Soluble Threshold Limit Concentrations (STLC) and Total Threshold Limit Concentrations (TTCL). The results of the analysis demonstrated that the Soitec CPV modules have detectable levels of nickel, copper, and vanadium, but in each case, the levels were below the STLC and TTLC regulatory limits. No other toxic metals were present in detectable amounts.

Soitec has chosen the State of California as a key location for its development of innovative CPV modules, and California has partnered with Soitec to encourage this promising technology. In 2011, the California Public Utilities Commission (CPUC) approved 300 MWp of PPAs, which are expected to use Soitec's technology. In 2012, Soitec opened its North American solar manufacturing facility in San Diego, California. Once at full capacity, the factory will have created California jobs for over 400 people. The factory is equipped with a state-of-the-art automated production line, which has the capacity to supply hundreds of MWp of contracts for utility-scale projects throughout the United States and overseas every year.

In 2013, two of Soitec's development projects were designated by Governor Brown as "Environmental Leadership" projects under the Jobs and Economic Improvement Act of 2011 (AB 900), which is intended to encourage California's economic recovery by providing a streamlined CEQA review process for construction projects that qualify as an environmental leadership development project and will make a substantial financial investment within California, create new high wage and highly skilled jobs, and will not result in any net additional greenhouse gas emissions. *See* Pub. Res. Code § 21178 *et seq.*

II. SOITEC'S COMMENTS ON THE PROPOSED RULEMAKING

A. Sections 66260.10 and 66273.9: Is the Definition of "PV Module" Intended to Encompass CPV Module Technology?

As a threshold question, Soitec requests that the Department consider that the definition of "PV module" should not encompass Soitec's CPV modules.

The Department's ISOR suggests that the intent of the rulemaking is to regulate PV modules, not

CPV modules. In the ISOR, the Department defined solar modules by reference to conventional PV modules. "Solar modules are a form of photovoltaic technology where a semiconductor material, such as silicon, cadmium telluride, or copper indium selenium, is encapsulated between two sheets of tempered glass." ISOR at 7. As part of its rationale for proposing the regulations at issue, the Department pointed to available information that "indicates that some solar modules are likely to exhibit the characteristic of toxicity due to heavy metals (e.g., cadmium, copper, lead, and selenium) and thus would be classified as hazardous waste if disposed." *Id.* at 8.

In contrast, Soitec's CPV modules employ optimized multi-junction solar cell technology that requires significantly smaller amounts of heavy metals to produce the equivalent amount of electricity. Furthermore, CPV modules are not constructed as PV modules are, and do not exhibit characteristics of toxicity due to heavy metals (e.g., cadmium, copper, lead, and selenium).

Furthermore, in October 2012, Soitec's CPV modules were analyzed for heavy metals using the STLC and TTCL methods. The results of the analysis demonstrated that the Soitec CPV modules have detectable levels of nickel, copper, and vanadium, but in each case, the levels were below the STLC and TTLC regulatory limits. No other toxic metals were present in detectable amounts.

B. Section 66273.7.1(b)(2): Confirm That A PV Module That Is Not Characteristically Hazardous Is Not A Universal Waste

Section 66273.7.1(b)(2) would exclude PV modules from coverage under Chapter 23 that "do not exhibit a characteristic of a hazardous waste as set forth in article 3 of chapter 11 and that are not otherwise identified as hazardous waste pursuant to chapter 11 of this division;"

The proposed regulations also would amend § 66261.9(a)(8) to add "PV modules, as described in section 66273.7.1, subsection (a)" to the list of wastes known as "universal wastes." It appears that the proposed amendment to § 66261.9(a)(8) is the only place in Chapter 11 of Division 4.5 that references PV modules.

Soitec requests that the Department clarify that the proposed amendment to § 66261.9(a)(8) would not prevent a PV module that otherwise is not characteristically hazardous from taking advantage of the exemption set forth in § 66273.7.1(b)(2), simply by virtue of the fact that § 66261.9(a)(8) lists PV modules as a universal waste. Such an interpretation would appear to defeat the purpose of the exemption provided in § 66273.7.1(b)(2).

C. Section 66273.7.1(b)(6): Confirm that Refurbishment Includes Remanufacture of a CPV Module

Section 66273.7.1(b)(2) would exclude PV modules from coverage under chapter 23 if they are "no longer identified as a waste (e.g., a discarded PV module[] that is refurbished and is returned to service)."

Due to the technological differences between CPV technology and PV technology, it is conceivable that Soitec could remanufacture existing CPV modules by removing useable components from one module and combining those components with new or recycled components from another module.

Soitec requests that the Department confirm that such remanufacturing would fall within the scope of § 66273.7.1(b)(6) exemption, or in the alternative, amend § 66273.7.1(b)(6) to read: "PV modules that were previously identified as waste pursuant to chapter 11, but are no longer identified as a waste (e.g., a discarded PV module that is refurbished or remanufactured and is returned to service)."

D. Section 66261.6(a)(8)(F): Confirm that a PV Module Vendor Need Not Register As A Universal Waste Handler

Section 66261.6(a)(8)(F) would permit a PV module vendor to conduct manual disassembly of PV modules, so long as the conditions of § 66261.6(a)(8) are met. Soitec requests that the Department confirm that a PV module vendor conducting such manual disassembly need not register as a universal waste handler. *See, e.g.,* § 66273.32(g)(1).

E. Section 66261.6(a)(8)(I): Clarifying That A PV Module That Is Exempt Under Section 66273.7.1(b)(2) Would Not Be Subject to Universal Waste Export Restrictions

Section 66261.6(a)(8)(I) would prohibit any person from "exporting PV modules unless export is conducted in accordance with applicable export requirements for universal waste as described in Article 4 of Chapter 23 of this division." This raises the possibility that a PV module that qualifies for the exemption from regulation as a universal waste under § 66273.7.1(b)(2) because it does not exhibit characteristics of a hazardous waste could nonetheless be required to comply with the export restrictions applicable to universal wastes as set forth in Article 4 of Chapter 23 of Division 4.5, simply by virtue of the fact that the device fits within the expansive definition of "PV module."

Soitec requests that the Department confirm that the intent of the proposed export restriction in § 66261.6(a)(8)(I) is that it not apply to a PV module that qualifies for the exemption from regulation as a universal waste under § 66273.7.1(b)(2) because it does not exhibit characteristics of a universal waste. Furthermore, Soitec requests that the Department revise § 66261.6(a)(8)(I) to clarify that the export requirements for universal waste do not apply if the PV modules in question do not exhibit characteristics of hazardous waste.

* * * * *

Soitec appreciates the opportunity to submit comments to the Department in furtherance of its development of the proposed regulations on the management of waste PV modules. Please direct any questions regarding the substance of these comments to Mr. Mark Richards, General Counsel and Legal Director, mark.richards@soitec.com, (858) 746-9000.

Very truly yours,

Karl Friedrich Haarburger
Chief Operating Officer
Soitec Solar Industries LLC