Date of Hearing: March 28, 2023

ASSEMBLY COMMITTEE ON ENVIRONMENTAL SAFETY AND TOXIC MATERIALS
Alex Lee, Chair
AB 2 (Ward) – As Amended March 16, 2023

SUBJECT: Recycling: solar photovoltaic modules

SUMMARY: Requires manufacturers of solar photovoltaic (PV) panels to develop and implement an end-of-life management plan (Plan) for the safe, convenient, and environmentally sound management and recycling of solar PV modules. Specifically, **this bill**:

1) Requires a manufacturer of solar PV panels sold or offered for sale in this state to develop a Plan for the safe, convenient, and environmentally sound management and recycling of the solar PV panels it manufactured and their component materials.

2) Authorizes a manufacturer of solar PV panels to designate an agent to act on its behalf to develop a Plan for solar panels.

3) Requires the Plan for solar PV panels to include, but is not limited to, the following:

    a) A plan to minimize the release of hazardous substances into the environment;

    b) A plan to maximize recovery of components, including rare earth metals and other commercially valuable materials;

    c) A plan to disseminate to relevant stakeholders information necessary for the proper dismantling, transportation, and treatment of solar PV panels; and,

    d) Performance goals, including but not limited to, a goal for the rate of combined reuse and recycling of collected solar PV panels.

4) Requires the Department of Resources, Recycling, and Recovery (CalRecycle) to develop guidelines for the development of the Plan.

5) Requires a manufacturer or its agent to submit to CalRecycle a Plan by July 1, 2026, for solar PV panels to be sold after July 1, 2026.

6) Requires a manufacturer of solar PV panels to implement a Plan that is approved by CalRecycle.

7) Requires a manufacturer or its agent, beginning on January 1, 2027, and by January 1, of each year thereafter, to provide CalRecycle with a written report for the prior calendar year documenting the implementation of its Plan and assessing the achievement of the performance goals contained in the Plan.

8) Requires, by January 1, 2026, CalRecycle to adopt regulations for the development and implementation of Plans.

EXISTING LAW:

1) Creates the Hazardous Waste Control Law (HWCL) and provides the Department of Toxic Substances Control (DTSC) with responsibility for overseeing the management of hazardous waste in California. (Health and Safety Code § 25100 et seq).

2) Defines hazardous wastes as those identified in regulation by DTSC; wastes categorized as hazardous under the federal Resource Conservation and Recovery Act (RCRA); and, extremely hazardous waste and acutely hazardous waste. (Health & Safety Code § 25117)

3) Regulates seven categories of hazardous wastes that can be managed as universal wastes. (California Code of Regulations, Title 22, Division 4.5, Ch. 22)

4) Requires the California Department of Resources Recycling and Recovery (CalRecycle) to coordinate with DTSC to develop and implement a public information program to provide uniform and consistent information on the proper disposal of hazardous substances found in and around homes, and to assist the efforts of counties required to provide household hazardous waste collection, recycling, and disposal programs. (Public Resources Code § 47050 - 47051)

5) Requires, by December 31, 2030, 50% of total retail sales of electricity in California to be generated from eligible renewable energy resources, including from solar energy. (Public Utilities Code (PUC) § 399.11-399.32)

6) Defines "solar energy system" as a solar energy device that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kilowatt, and produces not more than five megawatts, alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established by the Public Utilities Commission or the California Energy Commission. (PUC § 2852)

FISCAL EFFECT: Unknown.

COMMENTS:

Need for the bill: According to the author, "In 2006, California launched the Million Solar Roofs Initiative to incentivize consumers and businesses to invest in solar. As of 2022, California has the largest solar market in the United States, supplying over 20% of its electricity. Unfortunately, given a 20-30 year life span, many of these panels are beginning to reach the end of their lifecycle. Assembly Bill (AB) 2 will establish the foundation for a convenient, safe, and environmentally sustainable system for the end-of-life management of solar photovoltaic (PV) panels. With the right conditions in place, end-of-life industries for PV panels can thrive as an important pillar of a sustainable solar industry in California."

Life expectancy of a solar panel: According to the Solar Energy Industries Association, "[Solar panels] are designed to last more than 25 years, and many manufacturers back their products with performance guarantees backed by warranties. The lifespan of a [solar panel] is approximately 20-30 years, while the lifetime of an inverter is approximately 10 years. Therefore, many solar products have not yet reached end-of-life, and in fact, panels installed in the early 1980s are still performing at levels nearly equal to the installation performance level. Thus, even accounting for the dramatic growth of the industry, annual [solar panel] waste will not exceed 10,000 tons until after 2014, and will not exceed 100,000 tons until after 2017."

Right now, solar panel recycling suffers from a chicken-or-egg problem: there currently are not many places to recycle old solar panels, and there are not enough defunct solar panels to make recycling them economically attractive.

Solar energy is ever-growing: Under California law, SB 350 (De León, Chapter 547, Statutes of 2015), the renewable portfolio standard (RPS) requires 50% of all of California's energy to be generated from eligible renewable energy resources, including solar energy, by 2030. Solar power will be an integral part in reaching the RPS requirements for 2030.

Are solar panels hazardous? End-of-life disposal of solar products in the United States is governed by RCRA, and state policies that govern waste. To be governed by RCRA, solar panels must be classified as hazardous waste. To be classified as hazardous, panels must fail to pass the Toxicity Characteristics Leach Procedure (TCLP) test. Most solar panels pass the TCLP test, and thus are classified as non-hazardous and are not federally regulated. However, the production of solar panels involves toxic heavy metals, such as cadmium, copper, lead, and selenium; therefore, some solar panels are likely to exhibit the characteristic of toxicity that have adverse environmental and public health effects.

On October 1, 2015, SB 489 (Monning, Chapter 419, Statutes of 2015) was enacted to add Section 25259 to Health and Safety Code, which authorizes DTSC to adopt regulations to designate end-of-life photovoltaic modules that are identified as hazardous waste as a universal waste and subject those modules to universal waste management.

Universal waste: Universal wastes are hazardous wastes that are widely produced by households and many different types of businesses. Universal wastes include televisions, computers, other electronic devices, batteries, fluorescent lamps, mercury thermostats, and other mercury containing equipment, among others.

The hazardous waste regulations (CCR, Title 22, Division 4.5, Chapter 11 Section 66261.9) identify seven categories of hazardous wastes that can be managed as universal wastes. Any unwanted item that falls within one of these waste streams can be handled, transported, and recycled following the simple requirements set forth in the universal waste regulations (CCR, Title 22, Division 4.5, Chapter 23) versus the more stringent requirements for hazardous waste.

California's Universal Waste Rule (CCR, Title 22, Division 4.5, Chapter 11 Section 66261.9) allows individuals and businesses to transport, handle, and recycle certain common hazardous wastes, termed universal wastes, in a manner that differs from the requirements for most hazardous wastes. The more relaxed requirements for managing universal wastes were adopted to ensure that they are managed safely and are not disposed of in the trash. The universal waste requirements are also less complex and easier to comply with, thereby increasing compliance.

Product stewardship (stewardship): Product stewardship, also known as Extended Producer Responsibility (EPR), is a strategy to place a shared responsibility for end-of-life product management on the producers, and all entities involved in the product chain, instead of the general public. Product stewardship encourages product design changes that minimize a negative impact on human health and the environment at every stage of the product's lifecycle. This allows the costs of treatment and disposal to be incorporated into the total cost of a product. It places primary responsibility on the producer, or brand owner, who makes design and

marketing decisions. It also creates a setting for markets to emerge that truly reflect the environmental impacts of a product, and to which producers and consumers respond.

Current state stewardship programs: There are several statewide EPR programs in California, all of which are overseen by CalRecycle. They include: carpet materials management, paint product management, household batteries, mattress product management, and home-generated pharmaceutical waste and sharps waste.

This bill: It is important to note that this bill does not enact an EPR program for solar panels; however, AB 2, does enact one element of a solar panel EPR program by requiring manufacturers of solar panels to develop and implement an end-of-life management plan for solar panels. This bill is designed to work in tandem with AB 1238 (Ward) that is being heard in the Assembly Environmental Safety and Toxic Materials Committee the same day as this bill. AB 1238 requires DTSC to develop alternative management standards that are both protective of human health and the environment and that create flexibility for the solar panel recycling industry to recycle solar panels in California. While AB 2 does have a clear policy goal, it is still a work in progress. The author is working with stakeholders on a number of issues including how to best define "manufacturer" and what the elements of the end-of-life management plan should include.

Double-referral: Should this bill pass out of the Assembly Environmental Safety and Toxic Materials Committee, it will be re-referred to the Assembly Natural Resources Committee.

Arguments in support:

None on file.

Arguments in opposition:

None on file.

Related legislation:

1) AB 1238 (Ward). Requires DTSC to adopt, by January 1, 2026, alternative management standards for the management of solar panels. This bill is pending action before the Assembly Environmental Safety and Toxic Materials Committee.

2) AB 2440 (Irwin, Chapter 351, Statutes of 2022). Creates the Responsible Battery Recycling Act (Act) of 2022, which requires producers of covered batteries, as defined, to establish a stewardship program for the collection and recycling of covered batteries and covered battery-embedded products.

3) SB 289 (Newman, 2021). Would have enacted the Battery and Battery-Embedded Product Recycling and Fire Risk Reduction Act of 2021, which would have required the producers of batteries and battery-embedded products to establish a stewardship program for those products, with full implementation on or before June 30, 2025. This bill held on the suspense file in the Senate Appropriations Committee.

4) SB 212 (Jackson, Chapter 1004, Statutes of 2018). Requires entities that sell drugs or sharps in the state to individually, or with other entities, develop and implement a statewide home-

generated drug stewardship plan, or a home-generated sharps waste stewardship plan, or both, for the collection and proper disposal of home-generated drug and sharps waste. Requires CalRecycle to oversee and enforce each stewardship plan.

REGISTERED SUPPORT / OPPOSITION:

Support

None on file.

Opposition

None on file.

Analysis Prepared by: Josh Tooker / E.S. & T.M. /