

SOLAR PANEL RECYCLING

Discovering a Circular Economy in Solar Panels

EXECUTIVE SUMMARY

The number of solar panel installations continues to grow in California, but their short lifespans often lead to solar contractors stockpiling used panels and dumping them at hazardous waste landfills (or illegally disposing of them). The recent change of solar panels' classification to Universal Waste thankfully makes related waste management easier and less expensive. In 2018, the California Product Stewardship Council (CPSC) began working on two separate solar panel recycling projects (one in the City of Santa Monica and the other in Butte County) to promote the creation of a circular economy for solar panels. These projects uncovered a strong desire in Californians to reuse working panels, as well as a demand in Mexico for panels sourced from Santa Monica. In order to extend similar programs through the rest of California, CPSC and the staff of the solar pilot programs recommend the implementation of an Extended Producer Responsibility (EPR) strategy.



CPSC
California Product
Stewardship Council.

THE PROBLEM

The number of solar panels installations continue to grow year after year in California to meet climate and sustainability goals. However, solar panels only last on average 15-25 years before they must be removed and replaced. Many other factors, such as extreme weather, can cause damage requiring even earlier removal. This leads to many solar contractors stockpiling panels that have seen varying levels of use and often dumping them illegally or at hazardous waste landfills.

Solar panels were reclassified from Hazardous Waste to Universal Waste by the State Department of Toxic Substance Control (DTSC) in January of 2021, completely changing the game of solar panel disposal. The new classification makes solar panels easier and less expensive to manage.



SOLAR PANEL PILOT PROGRAM SUMMARY

In 2018, the California Product Stewardship Council (CPSC) started two separate solar panel recycling projects in the City of Santa Monica and the County of Butte.

Santa Monica

In June of 2018, the City of Santa Monica was awarded a \$50,000 grant from CalRecycle for a solar pilot program to be conducted with CPSC and other partners. Alongside these other organizations and with the help of the CA Conservation Corps, CPSC conducted outreach, surveyed stakeholders, and coordinated waste pick-ups from homeowners and solar installers. Collected solar panels were taken to CalMicro, a Universal Waste management company, to be recycled.

Butte

In August of 2018, The County of Butte Public Work's was awarded a \$100,000 grant from CalRecycle to run a solar panel pilot program alongside a 1-lb reusable propane cylinder program. Faced with a significant amount of public interest in proper panel disposal, CPSC, Butte County, and the City of Oroville worked closely with the Solar Energy Industry Association (SEIA) in piloting the solar panel recycling program.



RESULTS AND LESSONS

Based on Santa Monica estimates, it cost about \$17 per panel to haul and recycle panels. In total, 281 working and non-working solar panels were collected from the City of Santa Monica with 78 panels diverted for reuse. In Butte County, 127 solar panels were collected with 22 being sent to the Habitat for Humanity ReStore in Chico for resale, which sold out within an hour of the sale opening. This success of resale at the ReStore suggests that there is an obvious demand in California for used solar panels. Through these programs staff identified active partners like the CA Conservation Corps, who will be invaluable in similar projects involving solar panel recycling. Additionally, the discovery of underground demand for reused solar panels, including that in Mexico for panels sourced in Santa Monica, suggests additional avenues for pursuing a circular economy.



THE FUTURE

In order to extend these programs to the rest of California, CPSC and the staff of the solar pilot programs recommend the implementation of an Extended Producer Responsibility (EPR) strategy at the State or Federal level. EPR will ensure that the responsibility for the end-of-life management of solar panels is shared between producers and all entities involved in the product chain instead of the general public; while encouraging product design or redesign that minimizes the negative impacts on human health and the environment at every stage of the product's lifecycle. By setting the stage for a recycled commodities market, we can ultimately enable a true circular economy for solar panels.

**LEARN MORE ABOUT THE PROPER HANDING OF UNWANTED SOLAR PANELS:
CALPSC.ORG/SOLARPANELSTEWARDSHIP**

