

From: EERestakeholderEngagement <eerestakeholderengagement@ee.doe.gov>

Sent: Thursday, May 18, 2023 11:42 AM

To:

Subject: Response to your email to the U.S. Department of Energy

Dear Mr. Funk,

Thank you for your email regarding the situation in Harpersfield. We take these concerns very seriously. Garrett Nilsen, the Deputy Director of the Solar Energy Technologies Office, provided this response, which you can share with the concerned resident:

An unbroken PV panel has a strong encapsulant that prevents leaching. Cadmium telluride (CdTe) photovoltaic (PV) cells are sealed between two sheets of glass to protect the semiconductor materials from the outside environment; and silicon modules are typically sealed with a front sheet of glass with a polymer encapsulant and backsheet. The same encapsulation to protect the cells from the elements keeps the materials from being released outside the module, like how defroster elements are sealed in a car windshield.

While the encapsulation prevents chemicals from leaching from the modules, occasionally panels can get broken from weather or other events. The International Energy Agency Photovoltaic Power Systems Technology Collaboration Program (IEA PVPS) has published reports that address the concern of toxic leaching should a panel break in the field or when they are at their end of life. The U.S. Department of Energy (DOE) Solar Energy Technologies Office supports scientists from the U.S. National Renewable Energy Laboratory to ensure the validity of these studies and reports.

The “[Human Health Risk Assessment Methods for PV Part 2: Breakage Risks](#)” study revealed that the lead and cadmium exposure from broken solar panels in residential, commercial, and utility-scale systems would be below the acceptable limit set by the U.S. Environmental Protection Agency (EPA) for soil, air, and groundwater.

PV modules must undergo Toxicity Characteristic Leaching Protocol (TCLP) tests that are used by the EPA to determine whether a material can be safely disposed of in a typical municipal landfill environment. This is described in detail in “[The Human Health Risk Assessment Methods for PV Part 3 IEA PVPS](#)” report.

DOE also supports the proper operation and maintenance of panels to ensure that any broken panels are removed and properly disposed of. Furthermore, CdTe and silicon PV modules can be and, are being, recycled to recover and reuse the materials. DOE is investing in research to make these processes more economically competitive.

We hope this helps alleviate your concerns and hers.

Best regards,
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