

Solar energy and the environment

Solar energy offsets pollution from fossil fuels and the **overall impact of solar** on human health is **overwhelmingly positive**.

- » Health-related air quality benefits from solar energy are worth even more than the electricity itself¹
- » Modern, photovoltaic (PV) solar panels are made of materials typical of those found in electronic equipment and are encased, so as not to pose a concern for the water supply or public health²
- » Solar PV panels typically consist of glass, polymer, aluminum, copper and semiconductor materials that **can be recovered and recycled** at the end of their useful life³
- » To provide decades of corrosion-free operation, solar cells are **encapsulated from air and moisture between two layers of plastic**, with a layer of tempered glass and a polymer sheet or industrial laminate
 - In the same way a windshield cracks but stays intact, a damaged solar cell does not generally create small pieces of debris
- » Crystalline silicon panels represent approximately 90 percent of solar panels in use today
 - Research has shown they “**do not pose a material risk** or toxicity to public health and safety.”⁴
- » Thin-film solar panels represent a small percentage of panels in use today; some use a stable compound called cadmium telluride or other semi-conductor materials
 - Research has shown the tiny amount of cadmium in these panels **does not pose a health or safety risk**⁵



RECYCLING SOLAR PANELS



Although modern solar panels can be safely disposed of in landfills, they can also be recycled. PV solar panel recycling technologies have been implemented over the past decade and have been shown to recover over 95 percent of semiconductor material and over 90 percent of the glass in the panel.⁶ The industry is exploring the most cost-effective ways to recycle. First Solar, a U.S. company and the main supplier of thin-film panels has a robust solar take-back recycling program that has been operating commercially since 2005. Solar manufacturers and developers continue to research reducing use of raw materials, a secondary market for reuse, and recycling technologies.

Sources:

¹Wiser, Ryan et al. “On the Path to SunShot: The Environmental and Public Health Benefits of Achieving High Penetrations of Solar Energy in the United States.” National Renewable Energy Laboratory 2016.

²“Health and Safety Impacts of Solar Photovoltaics,” N.C. State University, N.C. Clean Energy Technology Center, May 2017.

³Ibid.

⁴Ibid.

⁵V. Fthenakis, K. Zweibel, “CdTe: Real and Perceived EHS Risks.” National Center for Photovoltaics and Solar Program Review Meeting, 2003.

⁶S. Weckend, A. Wade, G. Heath. “End of Life Management: Solar Photovoltaic Panels.” International Renewable Energy Agency, June 2016.