Solar Panel Disposal

Solar panels are one of the fastest growing energy sources in America. In 2020, solar panels provided about 40 percent of new U.S. electric generation capacity. They work by converting the sun's radiant energy into electricity by using photovoltaic cells. Some of the most common types of solar panels are mono- and poly-crystalline silicone, copper indium gallium selenide (CIS/CIGS), and cadmium telluride (CdTe) panels. Solar panels are designed to last 20 to 30 years but may need to be disposed of earlier if they are damaged or defective. The first wave of solar panels that were installed are already reaching the end of their useful lives and will soon require disposal.

Are Solar Panels Hazardous Waste?

Depending on the type of solar panel, it might be hazardous waste. Panels that contain heavy metals should be handled like hazardous waste under the Resource Conservation and Recovery Act (RCRA). Some examples of potentially hazardous waste include:

- **CdTe panels**, which may contain cadmium.
- **Gallium arsenide (GaAs) panels**, which may contain arsenic.
- **CIS/CIGS panels**, which may contain copper and/or selenium.
- **Older silicon panels**, which may contain hexavalent chromium coatings.

A toxicity characteristic leaching procedure (TCLP) test can be performed by a laboratory to determine if there are hazardous wastes or not. A solar panel manufacturer may be able to also provide this information. If a solar panel does not contain hazardous material, it may be disposed of as solid waste in a landfill.

How to Dispose of Hazardous Waste in Kentucky

If your solar panel disposal efforts generate hazardous waste, you must manage it according to regulations for your specific generator type. Hazardous waste generators are divided into three categories, according to how much they generate in a calendar month:

- Large Quantity Generators (LQGs). LQGs generate greater than or equal to 1,000 kg (approximately 2,200 lbs) of hazardous waste per month, or greater than 1 kg (approximately 2.2 lbs) of acutely hazardous waste per month.
- Small Quantity Generators (SQGs). SQGs generate more than 100 kg (approximately 220 lbs) but less than 1,000 kg (2,200 lbs) of hazardous waste per m0nth.
- Very Small Quantity Generators (VSQGs). VSQGs generate less than or equal to 100 kg (220 lbs) of hazardous waste per month, and less than or equal to 1 kg (2.2 lbs) of acutely hazardous waste per month.

How to Dispose of Hazardous Waste in Kentucky (CONT)

Solar panel disposal might be something done once or twice a year. These incidents are considered by the EPA to be "episodic events." If this happens, the generator may be eligible for a streamlined set of requirements to keep the smaller generators from having to comply with more extensive regulations. The Kentucky Division of Waste Management (DWM) allows for one episodic event each calendar year, but you can petition for a second. DWM would also require you to obtain a valid EPA ID number, a VSQG registration, and to submit two federal forms: an EPA 8700 and Episodic Form. Hazardous waste should be taken to a registered treatment, storage, and disposal facility (TSDF). A third-party company can be utilized to transport hazardous waste. Many transporters may require an EPA ID number, which can be obtained through registration with DWM.

Individual households, however, may have fewer requirements. Household solar panels can either be disposed of through solid waste or through periodic electronic waste collection events hosted by your county's Solid Waste Field Operations Branch. Some cities, like Lexington, offer free electronic recycling year round. Check with your county's solid waste coordinator on what is available near you. DWM maintains a list of each county's solid waste coordinator's contact information at https://eec.ky.gov/Environmental-Protection/Waste/recycling-and-local-assistance/Documents/Solid%20Waste%20Coordinators.pdf.

Are Solar Panels Recyclable?

Many individual components of a solar panel are recyclable. Glass makes up most of the weight of the average solar panel. Copper wire, aluminum frames, and electronic waste like battery backups may also be recycled. To know if recycling is available in your area, call your local recycling or waste management facility or DWM for guidance.

Reuse is another option for older panels that still have some functionality. Older panels can be refurbished and given a second life. They can also be used in settings that are not connected to the electrical grid like an electric vehicle charging station or remote locations. Some solar manufacturers include solar panel recycling and take back programs as a part of their products. First Solar is one such manufacturer.

Additional Information on Hazardous Wastes can be Found Below:

- What is a Hazardous Waste? https://www.epa.gov/hw/learn-basics-hazardous-waste
- End-of-Life Solar Panels: Regulations and Management https://www.epa.gov/hw/end-life-solar-panels-regulations-and-management

Have Additional Questions?

- Kentucky Division of Waste Management https://eec.ky.gov/Environmental-Protection/Waste/Pages/default.aspx
- Environmental Compliance Assistance Program: https://eec.ky.gov/Environmental-Protection/Compliance-Assistance/Pages/default.aspx