

Can a high-voltage pulse method enrich PV panel waste?

After separation, there was a 30% increment in silver concentration. Moreover, the processing cost of this method is found to be around 0.0019 \$/W, making it an economical solution for recycling PV panels. Zhao et al. (2020) performed a parametric investigation on a high-voltage pulse method to enrich PV panel waste.

How are PV panels heated?

In order to facilitate the process, the PV panels are heated by mixed system for medium and short wave infra-red prior to the mechanical detachment. The mechanical detachment of the glass is run by a high-frequency knife button, modulated in amplitude and speed. The outputs of this process are pieces of PV glass and the PV sandwich.

How are photovoltaic absorbers made?

The manufacturing typically starts with float glass coated with a transparent conductive layer, onto which the photovoltaic absorber material is deposited in a process called close-spaced sublimation. Laser scribing is used to pattern cell strips and to form an interconnect pathway between adjacent cells.

What are the barriers to PV panel recycling?

Emissions and Pollutants: One critical barrier to PV panel recycling is the emission of pollutants into the biosphere during the recycling process (Mahmoudi et al., 2019; Salim et al., 2019b).

How is silicon PV panel recycled?

This article illustrates and analyses an innovative process for the recycling of silicon PV panel. The process is based on a sequence of physical (mechanical and thermal) treatments followed by acid leaching and electrolysis. The Life Cycle Assessment methodology has been applied to account for the environmental impacts of the process.

How to improve the sustainability of silicon PV panels?

Recommendations include the use of computer-based simulation models, enhanced lab-scale experiments, and industry-scale implementation to ensure the sustainable recycling of silicon PV panels. Sajan Preet: Writing - review & editing, Writing - original draft, Formal analysis, Data curation, Conceptualization.

**ABSTRACT.** The recycling of photovoltaic modules has been a topic of increasing interest over the last years. At industrial scale, delamination of the module structure, which represents the first step in the recycling process, ...

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