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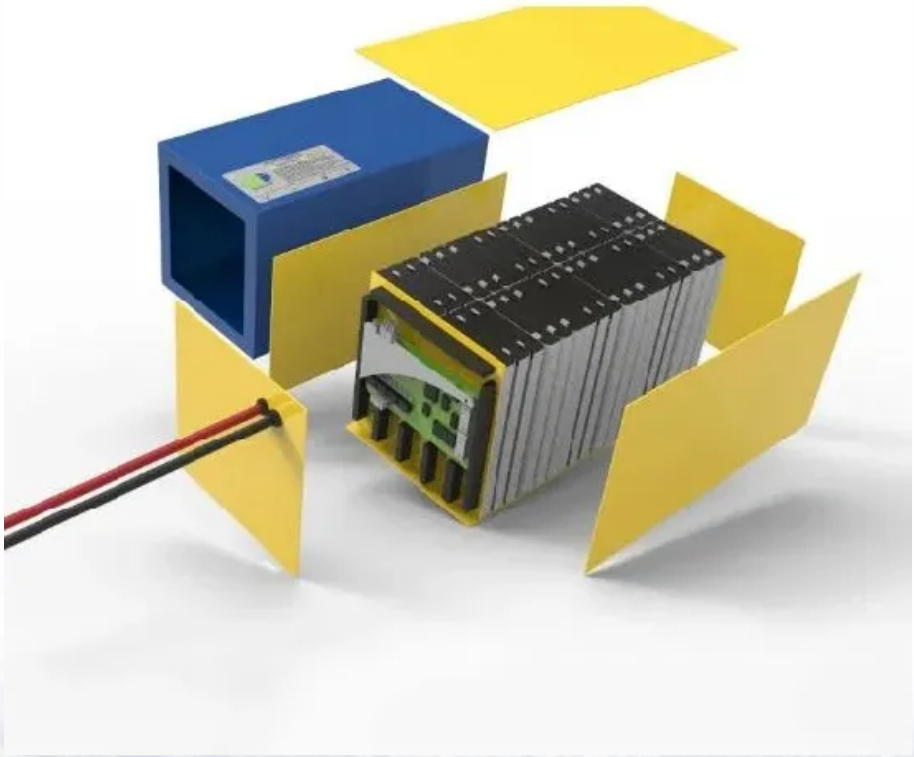
Solar Energy South Africa

Application for environmental impact assessment of photovoltaic panel dismantling



Overview

What is the environmental impact of PV panels?

A life cycle assessment (LCA) showed that incineration of the encapsulation layers has the highest impact, followed by the recovery of metals. Also, the environmental impact of PV panels is estimated to vary between countries and regions due to the local technosphere and socioeconomic characteristics (Frischknecht et al., 2015).

Can crystalline silicon PV panels be recycled at the end of life?

A proper disposal of decommissioned PV panels is crucial for avoiding environmental risks and for recovering value-added materials. In this study, a Life Cycle Assessment (LCA) was performed in order to assess the environmental performance of a new recycling process for crystalline silicon (c-Si) PV panels, at the End of Life (EoL).

Why is a proper disposal of decommissioned PV panels important?

As a consequence of the photovoltaic (PV) market expansion in the last 20 years, the cumulative global PV waste is expected to exponentially grow. A proper disposal of decommissioned PV panels is crucial for avoiding environmental risks and for recovering value-added materials.

How are spent PV panels recycled?

The environmental impacts were evaluated using the ton-kilometer method for a single-piston transport of spent PV panels from a specific location to a recycling site and the milk-run method to collect and transport spent PV panels from multiple locations using a 2-ton truck.

What is the environmental impact of EOL PV panels?

The environmental impact of EOL PV panels is influenced by various factors and dynamic processes, which poses challenges to the application of LCA methodology. These challenges can be summarized as follows: It is necessary

to establish a unified LCA framework, such as a unified system boundary, functional unit, and LCIA model.

What is the end-of-life treatment of PV panels?

The end-of-life treatment of spent PV panels has four major branches in resource circulation: collection of spent PV panel; Al frame recycling; cover glass recycling; and metal resource recovery, e.g., Cu and Ag recovery. It is noted that a junction box was excluded from the LCA boundary, though it was also removed and recycled.

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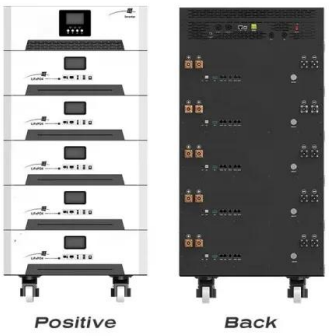

Environmental Impact Assessment of crystalline solar photovoltaic

The full life cycle of today's crystalline photovoltaic (PV) panel is dominated by a linear, open material flow paradigm. The Cradle-to-Cradle philosophy (C2C) applied in a Closed-Loop ...

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