Thermomechanical recycling technology for silver and silicon recovery from end-of-life solar panels

Summary

Profile type
Technology offer

Company's country
Germany

POD reference
TODE20260306011

Profile status
PUBLISHED

Type of partnership
Investment agreement
Commercial agreement with technical assistance

Targeted countries
• **Japan**

Contact Person
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Term of validity
11 Mar 2026
11 Mar 2027

Last update
11 Mar 2026

General Information

Short summary

SOLAR MATERIALS is a recycling company with focus on the recovery of silver and silicon from end-of-life solar panels. Through a fully automated thermomechanical reverse-production process, all materials are recovered in high purity. While conventional recycling mainly recovers glass and aluminium, SOLAR MATERIALS also recovers the high-value materials that make solar panel recycling economically viable. By returning these resources to the supply chain, the company enables a circular solar indus

Full description

Solar Materials is a recycling company specializing in the recovery of valuable materials from end-of-life solar panels. Unlike conventional recycling methods that primarily recover glass and aluminium while discarding the laminate containing silver and silicon, SOLAR MATERIALS uses a fully automated thermomechanical reverse-production process to disassemble solar modules step by step. This proprietary process enables the efficient recovery of all materials within a solar panel, including high-value metals and semiconductors like silver and silicon.

The company's recycling technology makes solar panel recycling economically viable and environmentally sustainable. Recovered materials achieve an up to 80% reduction in CO2 emissions and 95% lower energy consumption compared to primary raw materials, contributing to a circular economy in the photovoltaic sector.

Currently, SOLAR MATERIALS operates with a recycling capacity of 7,000 tonnes of solar panels per year, with plans to double capacity by 2026. The company is expanding internationally and is entering new markets where existing recycling processes fail to recover silver and silicon, resulting in material loss or downcycling, for example in markets such as Japan where recycling often focuses mainly on glass and aluminium recovery..

To address this gap, SOLAR MATERIALS plans to establish demonstration lines to process laminates from local recycling operators and recover the remaining valuable materials. This approach complements existing recycling infrastructure rather than competing with it, creating a closed-loop value chain for solar panel recycling.

Advantages and innovations

SOLAR MATERIALS addresses a key gap in the solar panel recycling chain. While existing recyclers mainly recover glass and aluminium, the laminate containing silver and silicon is often discarded or destroyed. SOLAR MATERIALS focuses on this stage by using its fully automated thermomechanical reverse-production process to recover these high-value materials efficiently.

By integrating with the current recycling infrastructure rather than competing with it, SOLAR MATERIALS completes the value chain and ensures that valuable resources are not lost. This improves the overall efficiency and sustainability of the recycling process.

The process reduces CO2 emissions by approximately 80% and saves 95% of the energy compared with producing primary materials. By recovering silver and silicon, SOLAR MATERIALS enhances resource efficiency and contributes to more complete material recovery in the photovoltaic sector.

Technical specification or expertise sought

Stage of development

Already on the market

Sustainable Development goals

- **Goal 9: Industry, Innovation and Infrastructure**
- **Goal 13: Climate Action**
- **Goal 17: Partnerships to achieve the Goal**
- **Goal 7: Affordable and Clean Energy**
- **Goal 12: Responsible Consumption and Production**

IPR Status

IPR granted

IPR Notes

Partner Sought

Expected role of the partner

SOLAR MATERIALS is seeking partnerships to integrate its technology into solar panel recycling value chains, with a particular focus on establishing cooperation in Japan. The company is primarily looking for collaboration with recycling companies that process end-of-life solar panels and can provide access to laminates containing silver and

silicon.

In addition, SOLAR MATERIALS is interested in cooperation with buyers and industrial users of recovered silver and silicon in order to reintegrate these materials into industrial supply chains, including potential partners in Japan. Partners will play a central role in enhancing resource recovery, improving economic efficiency, and demonstrating the environmental benefits of advanced solar panel recycling.

Type of partnership

Investment agreement

Commercial agreement with technical assistance

Type and size of the partner

- **Big company**
- **SME 50 - 249**
- **SME 11-49**
- **Other**
- **SME <=10**

Dissemination

Technology keywords

- **02003001 - Process automation**
- **10003004 - Recycling, Recovery**
- **10002007 - Environmental Engineering / Technology**
- **04005004 - Photovoltaics**

Market keywords

- **08004002 - Chemical and solid material recycling**
- **06003002 - Photovoltaics**

Targeted countries

- **Japan**

Sector groups involved