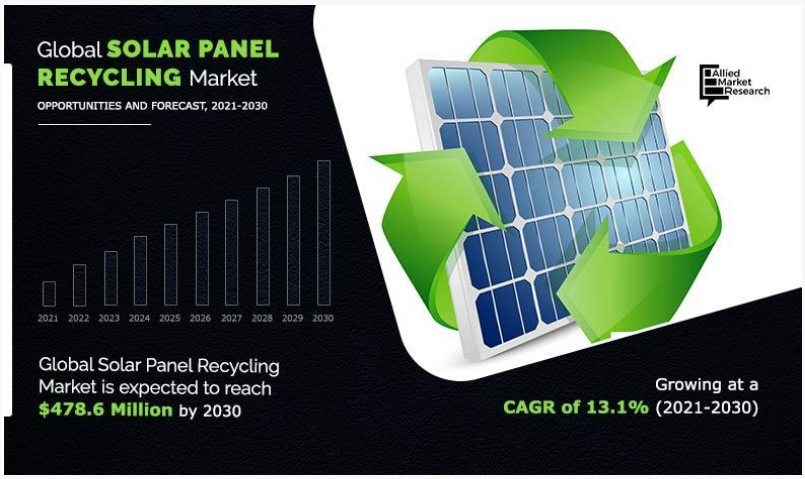
Sustainability and Circular Economy Drive Growth in the Solar Panel Recycling Market to 2030

Global Solar Panel Recycling Industry Set to Hit $478.6 Million by 2030 Amid Rising End-of-Life PV Modules



WILMINGTON, DE, UNITED STATES, October 22, 2025 /EINPresswire.com/ --

The solar panel recycling market is gaining momentum as renewable energy adoption surges worldwide. According to a report by Allied Market Research, the global solar panel recycling market size was valued at $139.7 million in 2020 and is projected to reach $478.6 million by 2030, growing at a strong CAGR of 13.1% from 2021 to 2030.

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> Solar panel recycling market to reach $478.6 million by 2030, driven by sustainability goals, waste reduction, and circular economy focus.”
>
> *Allied Market Research*

The increasing installation of solar panels for power generation, heating, and transportation, managing the panels at their end-of-life stage is becoming essential. Solar panel recycling provides a sustainable solution by recovering valuable materials, reducing waste, and supporting the circular economy.

Europe currently leads the market, driven by strong environmental policies and established recycling frameworks, while Asia-Pacific is expected to record the fastest growth due to expanding solar capacity in China, India, and Japan.

The solar panel recycling industry is witnessing strong growth due to the rising number of end-of-life photovoltaic (PV) panels and the global focus on sustainability and waste reduction.

Recycling solar panels helps recover valuable materials such as silicon, silver, aluminum, and glass, reducing the environmental impact of discarded panels and supporting a circular economy.

The surge in solar energy adoption over the past decade has led to a growing need for efficient recycling infrastructure to manage aging PV modules. Governments across Europe, North America, and Asia-Pacific are implementing regulations and incentives to encourage solar waste management and material recovery.

Thermal and mechanical recycling processes are gaining popularity for their effectiveness in separating components, while advancements in chemical recycling technologies promise higher recovery efficiency.

 Rising Demand for Solar Panel Recycling

The rapid expansion of the global solar industry has created an equally urgent need for solar panel recycling solutions. Factors driving this growth include:

Increasing solar power installations across residential, commercial, and industrial sectors.

Government incentives such as tax credits and subsidies that promote renewable energy adoption.

Technological improvements in solar panels, which lower costs and drive mass adoption.

Regulations in Europe and Asia-Pacific, encouraging structured recycling of photovoltaic (PV) modules.

For example, the U.S. introduced a solar tax credit to cut installation costs by up to 30%, further boosting solar deployment and indirectly increasing recycling demand.

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 Market Segmentation Analysis

The solar panel recycling market analysis segments the industry by process, type, and region.

By Process:

Thermal – Accounted for 68.9% share in 2020, expected to maintain dominance due to its high recovery efficiency (up to 98% of unbroken cells).

Mechanical – Held 23.9% share in 2020, forecasted to grow steadily at 13.4% CAGR.

Laser – Emerging as a niche process with advanced recycling potential.

By Type:

Crystalline Silicon – The largest market segment, driven by its widespread use in standalone PV systems like solar streetlights and telecom towers.

Thin Film – The fastest-growing type, expected to expand at 14.6% CAGR between 2021–2030 due to its efficiency and rising adoption.

 Regional Insights

Europe dominated the global solar panel recycling market in 2020, holding over 43.2% market share. Strong government policies, a large consumer base, and leading recycling companies drive growth in the region.

Asia-Pacific is projected to grow rapidly, fueled by increasing demand for solar energy in China, India, and Japan.

North America and LAMEA are also adopting solar recycling practices, though at a relatively slower pace compared to Europe.

Europe is expected to maintain leadership, registering the fastest growth at a CAGR of 13.7% during the forecast period.

 Key Market Players

Several companies are actively shaping the solar panel recycling industry, including:

Aurubis AG

Canadian Solar

Echo Environmental, LLC

Envaris GmbH

First Solar

Hanwha Group

Reiling GmbH & Co. KG

Silrec Corporation

SunPower Corporation

Trina Solar

Other participants include Yingli Energy, Zorlu Holding, Rinovasol Group, ECS Refining, and SiC Processing GmbH, reflecting a competitive landscape with opportunities for innovation.

 COVID-19 Impact

The COVID-19 pandemic slowed growth in 2020 due to supply chain disruptions, labor shortages, and reduced investments. Many European economies, including Germany, France, Spain, and Italy, implemented strict lockdown measures, limiting manufacturing and recycling operations.

However, as global economies recover, solar installations are expected to surge again, creating long-term opportunities for the solar panel recycling market.

 Future Outlook

The future of the solar panel recycling market looks promising, driven by:

Rising awareness of e-waste management in renewable energy.

Technological innovations improving recovery rates of silicon, glass, and precious metals.

Circular economy initiatives ensuring sustainability of solar power adoption.

Government regulations mandating recycling responsibilities for manufacturers.

By 2030, solar panel recycling will become a mainstream industry, helping reduce environmental impact while maximizing material recovery for reuse.

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 Conclusion

The solar panel recycling market is set for rapid expansion, backed by increasing solar installations, regulatory support, and technological progress. With a projected value of $478.6 million by 2030, recycling will play a critical role in making solar energy not just renewable, but

also truly sustainable.

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