

Perovskite Solar Cell Market Set for 33.3% CAGR Growth Through 2028 | Clean Energy Outlook

Perovskite Solar Cell Market to Reach \$2.7 Billion by 2028 | High-Efficiency Solar Innovation Accelerates

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According to a recent report published by Allied Market Research, the [perovskite solar cell market](#) size was valued at \$0.7 billion in 2023 and is

projected to reach \$2.7 billion by 2028, registering an impressive CAGR of 33.3% from 2024 to 2028. This rapid expansion is driven by rising demand for flexible, lightweight, and high-efficiency solar technologies suitable for next-generation renewable energy systems.

“

Perovskite solar cell market to grow from \$0.7B in 2023 to \$2.7B by 2028, driven by demand for lightweight, high-efficiency renewable solar solutions.”

Allied Market Research

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Understanding Perovskite Solar Cells

Perovskite solar cells (PSCs) utilize perovskite-structured compounds, typically hybrid organic-inorganic lead or tin halide materials, to convert sunlight into electricity. The unique perovskite crystal structure enables strong light

absorption, high charge-carrier mobility, and tunable bandgaps. As a result, PSCs demonstrate higher efficiency potential compared to conventional silicon-based solar cells, while offering lower production costs and easier fabrication processes, such as solution-based coating and roll-to-roll manufacturing.

These advantages position PSCs as a transformative technology for the [renewable energy](#)

Report Insights



Market was valued at
\$0.7 Billion
2023

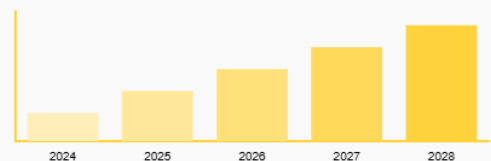


Projected to reach
\$2.7 Billion
2028



Growing at a CAGR
33.3% From
2024-2028

CAGR 33.3%



Perovskite Solar Cell Market
Report Code: A13745

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[industry](#), capable of accelerating the global shift toward affordable clean power.

Market Drivers □

Rising Demand for Lightweight and Flexible Solar Panels

The growing interest in flexible and lightweight solar power solutions is significantly boosting the perovskite solar cell market trend. Unlike rigid silicon panels, perovskite solar cells are thin, lightweight, and highly adaptable, making them suitable for:

Building-integrated photovoltaics (BIPV)

Portable and wearable solar devices

Aerospace and drone power systems

Electric vehicle surface-mounted solar

Curved and irregular architectural surfaces

This versatility enables deployment in environments where traditional panels are impractical due to weight or structural limitations.

Growth in Clean Energy and Climate Policies □

Governments across North America, Europe, and Asia-Pacific are promoting renewable energy adoption to reduce carbon emissions and enhance energy independence. Supportive policies, research funding, and public-private collaboration are accelerating the development and commercialization of next-generation solar cells, including perovskite-based photovoltaic technologies.

Market Restraints □□

Despite strong growth potential, stability and durability challenges remain major concerns. Perovskite materials can degrade when exposed to:

Moisture

UV radiation

High temperatures

Long-term oxygen exposure

This impacts long-term performance, reducing expected operational lifespans compared to the proven reliability of silicon-based solar modules. Addressing these durability issues through encapsulation techniques, material engineering, and hybrid cell structures is a central focus of ongoing research and commercialization strategies.

Procure This Report (380 Pages PDF with Insights, Charts, Tables, and Figures):

<https://www.alliedmarketresearch.com/checkout-final/c782554062342f34e8e57fcec00a01ae>

Growth Opportunities □

Integration into Building-Integrated Photovoltaics (BIPV) □

One of the most promising opportunities for the perovskite solar cell market lies in its integration into [BIPV systems](#). The ability to fabricate transparent or semi-transparent perovskite coatings allows the creation of:

Solar windows

Energy-generating facades

Rooftop tiles

Exterior building cladding

These applications support smart city infrastructure, minimize grid dependence, and introduce scalable distributed energy solutions.

Furthermore, low-temperature processing and roll-to-roll manufacturing enable cost-effective mass production, improving accessibility for commercial and residential construction sectors.

Market Segmentation Overview □

The market is segmented by structure, product type, method, end-use, and region:

Structure: Planar PSCs and mesoporous PSCs

Product Type: Rigid and flexible perovskite solar cells

Method: Solution processing, vapor deposition, and vapor-assisted methods

End-Use Industries: Aerospace, industrial automation, consumer electronics, energy, and others

Regions: North America, Europe, Asia-Pacific, and LAMEA

Asia-Pacific is emerging as the fastest-growing region, driven by increasing renewable energy investments, supportive policy frameworks, and the rapid expansion of solar manufacturing capabilities in China, Japan, South Korea, and India.

Key Market Participants □

Major companies operating in the perovskite solar cell market include:

Oxford Photovoltaics

Saule Technologies

Panasonic Holdings Corporation

Toshiba Corporation

LONGi

Phono Solar Technology Co., Ltd.

Hanwha Group

Xiamen Weihua Solar Co., Ltd.

SKY ENERGY INDONESIA

Front Materials Co., Ltd.

These organizations are focused on commercial-scale manufacturing, pilot testing, encapsulation solutions, and performance optimization to unlock market scalability.

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Conclusion □

The perovskite solar cell market is undergoing rapid technological advancement and commercialization momentum. While durability challenges persist, ongoing material innovations, investment in production infrastructure, and increasing demand for adaptable, lightweight solar technologies are expected to drive strong market growth through 2028. As perovskite technology

continues to evolve, it holds significant potential to reshape global renewable energy landscapes and accelerate the transition toward sustainable power systems.

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