

# Solar Photovoltaic Market Size to Surge from USD 100.26 Billion in 2024 to USD 226.68 Billion by 2034 at 8.50% CAGR

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EINPresswire.com/ -- According to a new market research report, the [global solar photovoltaic \(PV\) market size](#) was valued at approximately USD 100.26 billion in 2024 and is projected to reach

USD 226.68 billion by 2034, expanding at a CAGR of 8.50% between 2025 and 2034. The industry's growth is driven by the accelerating transition to renewable energy, favorable government policies, and dramatic reductions in the cost of solar technology over the past decade.

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The global solar photovoltaic market size was worth around USD 100.26 billion in 2024 and is predicted to grow to around USD 226.68 billion by 2034, (CAGR) of roughly 8.50% between 2025 and 2034.”

*Deepak Rupnar*



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## Market Overview

Solar photovoltaic (PV) systems convert sunlight directly into electricity using semiconducting materials. PV technology has become a cornerstone of the global energy

transition, offering a clean, reliable, and increasingly affordable alternative to fossil fuel-based electricity.

Key factors contributing to the market's growth include:  
Ambitious renewable energy targets by governments.

Significant advancements in solar cell efficiency.

Expansion of utility-scale solar farms and rooftop installations.

Integration of solar power with energy storage systems.

Rising corporate investments in green energy procurement.

The global PV industry is shifting from being policy-driven to cost-driven as solar becomes one of the cheapest forms of new power generation worldwide.



### Key Market Drivers

#### Declining Cost of Solar PV Modules

Continuous improvements in manufacturing processes, supply chain optimization, and economies of scale have dramatically reduced module costs, making solar competitive with conventional energy.

#### Government Incentives and Policies

Feed-in tariffs, tax credits, renewable portfolio standards, and net-metering policies worldwide are driving adoption.

#### Energy Security and Decarbonization Goals

Nations are increasingly prioritizing solar energy to diversify their energy mix and meet carbon neutrality goals by 2050.

#### Technological Advancements

Innovations such as bifacial modules, PERC (Passivated Emitter Rear Cell) technology, heterojunction cells, and tandem perovskite-silicon solar cells are pushing efficiency boundaries.

#### Corporate Sustainability Commitments

Corporations are investing in on-site solar or entering long-term power purchase agreements (PPAs) to meet ESG targets.

#### Integration with Energy Storage

The growing availability of affordable batteries enables smoother integration of solar power into grids and enhances its reliability.

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### Market Restraints

**Intermittency Issues:** Solar generation depends on weather and daylight hours, requiring complementary storage or grid balancing solutions.

**Land Use Concerns:** Large-scale projects require substantial land, which can lead to conflicts

over land availability.

Supply Chain Vulnerabilities: Concentrated production of polysilicon and modules in specific regions may pose geopolitical risks.

Initial Investment Costs: Despite declining prices, upfront costs remain a barrier in some regions without financial incentives.

## Market Segmentation

The solar photovoltaic market can be segmented by technology, grid type, installation type, end user, and region.

### 1. By Technology

Monocrystalline Silicon PV Modules

High-efficiency cells suitable for limited-space installations.

Polycrystalline Silicon PV Modules

Cost-effective and widely used for residential and commercial projects.

Thin-Film PV Modules

Lightweight and flexible; suitable for building-integrated PV (BIPV) and off-grid applications.

Bifacial Solar Panels

Capture sunlight from both sides to increase energy yield.

Heterojunction and Tandem Cells

Next-generation technologies promising higher efficiencies.

### 2. By Grid Type

On-Grid (Grid-Connected) Systems

Dominant segment; allows export of excess power back to the grid under net-metering policies.

Off-Grid Systems

Standalone systems used in remote areas or for applications such as telecommunications and rural electrification.

### 3. By Installation Type

Utility-Scale Solar Farms

Large projects supplying electricity to grids, often under long-term PPAs.

Commercial & Industrial Rooftops

Solar arrays on warehouses, factories, and offices to reduce electricity costs and carbon footprints.

Residential Rooftops

Small-scale systems for homes, supported by tax credits and net-metering policies.

Floating Solar PV

Emerging trend utilizing water bodies to save land and improve efficiency due to natural cooling effects.

### 4. By End User

Residential

Growing adoption due to rising electricity tariffs and government incentives.

Commercial & Industrial

Corporates increasingly using solar to power operations sustainably.

Utility Sector

Largest segment due to bulk power generation projects.

Regional Insights

1. Asia Pacific (APAC)

Market Leadership:

APAC dominates global solar PV installations, led by China, India, Japan, and Australia.

Key Trends:

Massive state-backed projects, solar-plus-storage initiatives, and expansion of domestic manufacturing capacity for modules and inverters.

China: World's largest producer and installer of solar PV; aggressively investing in ultra-high voltage transmission lines to distribute renewable energy.

India: Ambitious National Solar Mission aiming for 500 GW of renewable energy capacity by 2030.

2. North America

United States:

Federal Investment Tax Credit (ITC), state-level renewable portfolio standards, and corporate PPAs are driving growth.

Canada:

Transitioning to clean energy with investments in community solar and indigenous-led renewable projects.

Trends:

Integration of solar with energy storage and EV charging infrastructure.

3. Europe

Renewed Focus on Energy Independence:

The Russia-Ukraine conflict accelerated Europe's shift to renewable energy to reduce reliance on imported fossil fuels.

Key Markets: Germany, Spain, France, Italy, and the UK.

Trends: Rooftop solar subsidies, feed-in tariffs, and green hydrogen projects supported by solar generation.

4. Latin America

Emerging Solar Hotspot:

Countries like Brazil, Chile, and Mexico are leveraging abundant sunlight and competitive auction prices to scale solar deployment.

Trends: Utility-scale solar farms and hybrid renewable plants combining wind and solar.

5. Middle East & Africa (MEA)

## Mega Projects:

Saudi Arabia, UAE, and Egypt are launching some of the world's largest solar farms under long-term vision plans.

Africa: Off-grid and mini-grid solar systems are transforming rural electrification in sub-Saharan Africa.

Trends: Floating solar in desert reservoirs and large-scale storage paired with solar.

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## Competitive Landscape

The global solar PV market is fragmented yet highly competitive, with both established players and emerging companies innovating across the value chain from polysilicon manufacturing to EPC (engineering, procurement, construction) services.

### Major Key Players:

First Solar Inc.

Trina Solar Limited

Canadian Solar Inc.

LONGi Green Energy Technology Co., Ltd.

JA Solar Holdings Co., Ltd.

JinkoSolar Holding Co., Ltd.

SunPower Corporation

Hanwha Q CELLS

Risen Energy Co., Ltd.

Talesun Solar Technologies

Sharp Corporation

REC Solar Holdings AS

Suntech Power Holdings Co., Ltd.

Enphase Energy, Inc. (inverters)

SolarEdge Technologies Inc. (inverters)

### Key Strategies

Vertical Integration: Many manufacturers are expanding upstream into polysilicon and downstream into EPC to control quality and costs.

Geographic Expansion: Establishing new manufacturing plants in the U.S., India, and Europe to mitigate trade barriers and supply chain risks.

Product Innovation: Bifacial panels, smart modules with integrated microinverters, and lightweight panels for rooftops.

Strategic Partnerships: Collaborating with energy storage companies and grid operators to deploy solar-plus-storage solutions.

## Recent Industry Developments

Perovskite-Silicon Tandem Cells: Achieving record efficiencies in lab tests, soon to be commercialized.

Floating PV Projects: Rapidly scaling in Asia and Europe due to land constraints.

Corporate Renewable Deals: Tech giants and large corporations signing multi-gigawatt PPAs.

Blockchain and Digitalization: Used for tracking renewable energy certificates (RECs) and enabling peer-to-peer energy trading.

### Future Outlook

The next decade will be transformative for the solar PV market as the world accelerates toward net-zero emissions. Key trends include:

Massive Growth in Utility-Scale Solar Farms: Particularly in emerging economies with abundant sunlight.

Decentralized Energy Systems: Rooftop solar, community solar, and microgrids empowering consumers.

Hybrid Renewable Plants: Combining solar, wind, and storage to create firm renewable energy capacity.

Green Hydrogen Production: Solar will be a key power source for electrolysis plants producing green hydrogen.

Circular Economy Practices: Recycling end-of-life solar panels and reducing environmental impacts across the value chain.

By 2034, solar PV will not only be a mainstream power source but also a critical enabler of electrification in transportation, industry, and heating.

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