



FACT SHEET



Task 1 Analysis & Outreach

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Trends in Photovoltaic Applications

October
2026



The global PV market 2025

Global PV capacity reached 2.96 TW at the end of 2025, with around 690 GW installed during the year. This represents a 15% increase compared with 2024, following the exceptional growth of the previous two years.

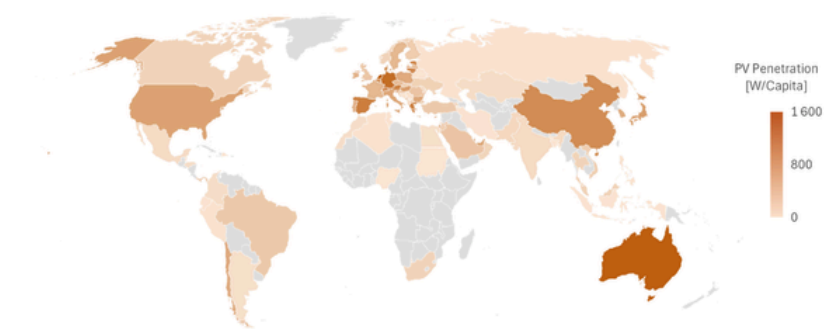

2.96 TW
CUMULATIVE
CAPACITY


0.69 TW
INSTALLED IN 2025


+15%
YEAR ON YEAR

The continued expansion resulted from a combination of increased action on climate imperatives, very low module costs and strong deployment in China and other major markets.

PV PENETRATION PER CAPITA IN 2025



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SOURCE: IEA PVPS & OTHERS

China drives global growth

China remained by far the world's largest PV market, installing 415 GW in 2025 – 16% more than in 2024.

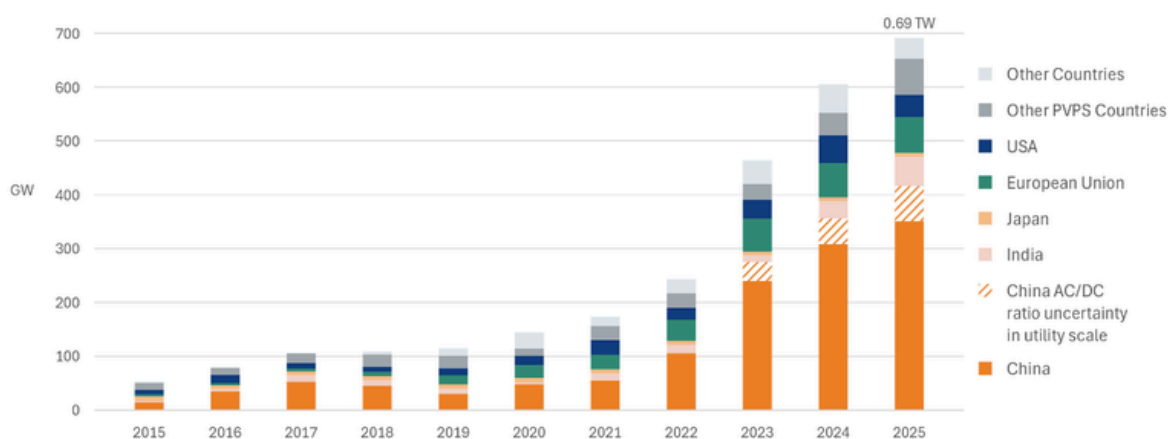

415 GW
INSTALLED IN CHINA
IN 2025


60%
OF GLOBAL ANNUAL
INSTALLATIONS


1.46 TW
CUMULATIVE CAPACITY
IN CHINA

The world's largest PV markets

EVOLUTION OF ANNUAL PV INSTALLATIONS IN MAJOR MARKETS



SOURCE: IEA PVPS & OTHERS



Top 10 Countries in 2025

For Annual Installed Capacity

	China	415 GW
	India	54.2 GW
	USA	42.5 GW
	Germany	17.6 GW
	Pakistan	13.8 GW
	Brazil	12.5 GW
	Spain	12.1 GW
	France	7.4 GW
	Saudi Arabia	6.8 GW
	Italy	6.7 GW

For Cumulative Capacity

	China	1 464 GW
	USA	266 GW
	India	179 GW
	Germany	118 GW
	Japan	103 GW
	Brazil	65 GW
	Spain	61 GW
	Australia	44 GW
	Italy	44 GW
	Korea	35 GW

Regional Highlights

Asia Pacific



~515 GW

New PV capacity in 2025
(74% of global total)

- China remains the dominant market, with 415 GW installed in 2025.
- India recorded strong growth, reaching 54 GW in 2025.
- Deployment continues to expand across the region.

Americas



~72 GW

New PV capacity in 2025
(10% of global total)

- The USA installed 42.5 GW, remaining the third-largest national market.
- Brazil was among the global top 10 markets, with 12.5 GW installed.
- PV deployment continued to expand across the region.

Europe



~79 GW

New PV capacity in 2025
(11% of global total)

- Utility-scale deployment increasingly compensated for slower growth in some distributed markets.
- Grid constraints, curtailment and market conditions are becoming more important.
- Several European countries remain among the global leaders in cumulative capacity.

Middle East and Africa



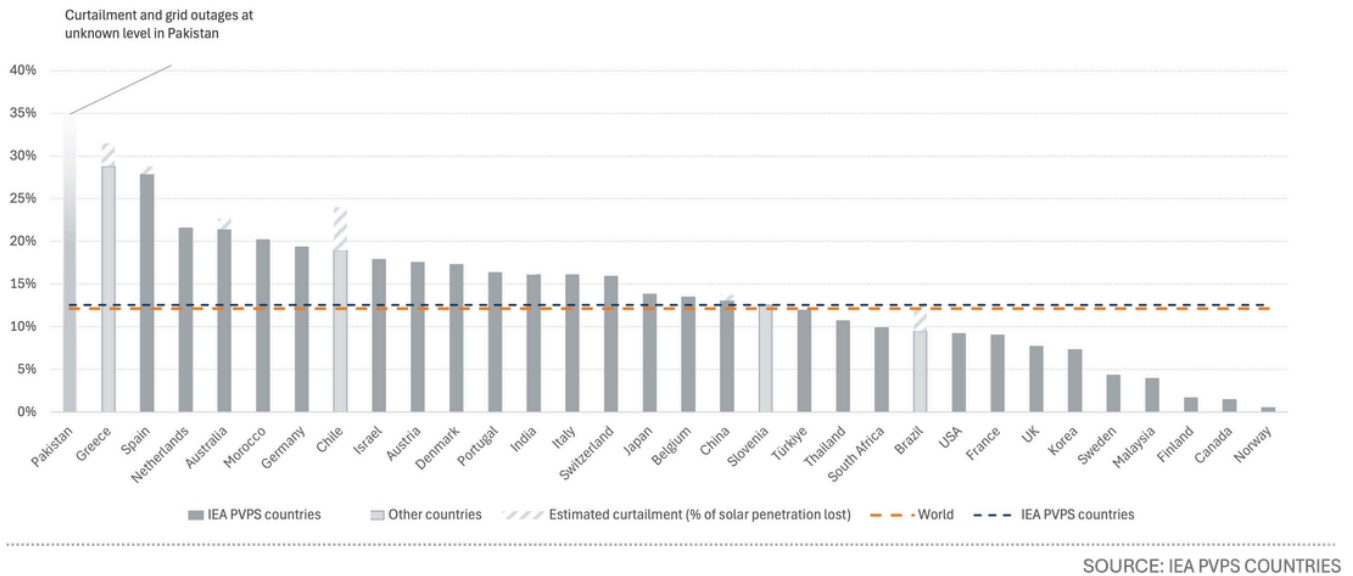
~26 GW

New PV capacity in 2025
(4% of global total)

- Saudi Arabia entered the global top 10 markets, with 6.8 GW installed.
- Large-scale projects continue to drive deployment in the Middle East.
- PV markets are developing quickly across several African countries.



PV Contribution to Electricity Consumption in 2025



Economic Impact



Global Business Value

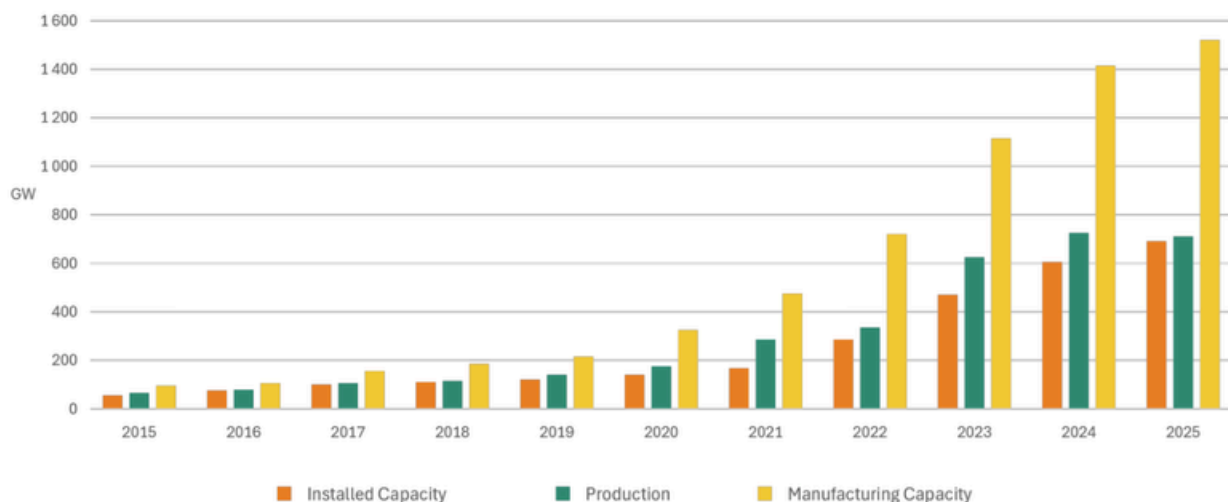
- Global PV market valued at approximately USD 400 billion in 2025
- Continued growth in PV deployment worldwide



Employment Growth

- Approximately 8.2 million jobs worldwide in the PV sector
- PV remains a major source of employment in the renewable energy industry

Yearly PV Installation, Module Production, and Module Production Capacity





PV Market Segmentation



Centralised PV

- 410 GW (59% of new capacity)
- China remains the largest market for utility-scale PV
- Large-scale installations continue to drive global PV deployment



Distributed PV

- 282 GW (41% of new capacity)
- Distributed installations increased from 228 GW in 2024
- Self-consumption remains an important driver in many markets

Emerging Segments



Agrivoltaics

- An increasingly established segment, with commercial projects emerging without direct investment support.
- National regulations and performance assessment criteria remain fragmented



Floating PV

- 22 TW theoretical potential using 10% of global inland reservoirs.
- 1 GW open-sea floating PV project commissioned in China in 2025.
- Larger projects increasingly combined with storage and hydropower.



Infrastructure-Integrated PV

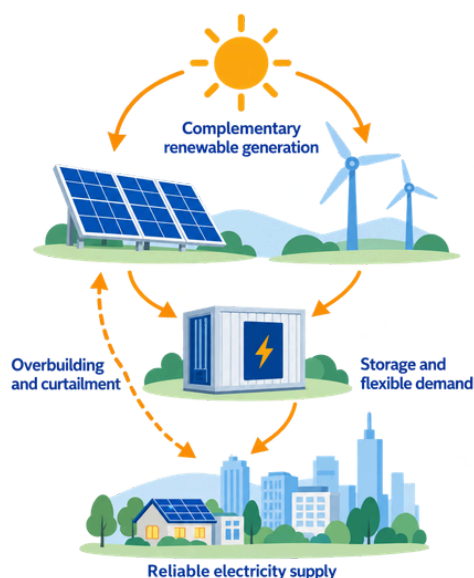
- 403 GW estimated technical potential along EU roads and railways
- Equivalent to 391 TWh/year of electricity generation
- Applications expanding to noise barriers, canals and transport infrastructure



BIPV

- ~350 MW installed in Europe in 2024
- Less than 1% of annual distributed PV installations
- European markets largely stagnated or contracted in 2025

Firm Power



Combining renewable sources

Cost-optimised combinations of solar, wind, storage and demand flexibility can provide firm electricity supply throughout the year.



Overbuilding and Curtailment

Installing additional renewable capacity and deliberately curtailing some generation can reduce overall system costs and the need for long-duration storage.



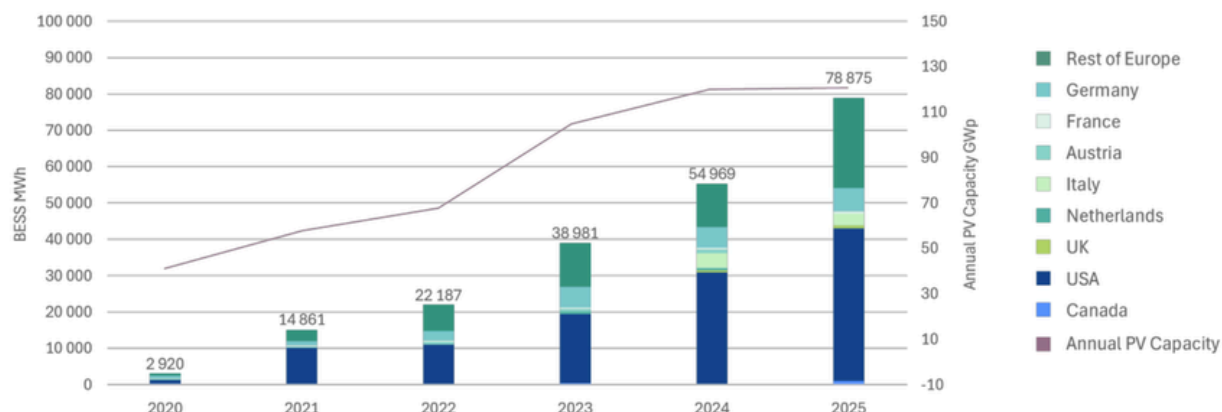
System Optimisation

Integrated system planning, advanced modelling and market frameworks are key to ensuring cost-effective and reliable power supply.



Battery Storage

Annual Battery Energy Storage System (BESS) in Selected Countries



SOURCE: IEA PVPS, SPE, PVAUSTRIA, CANREA, ENEDIS, BATTERY CHARTS .DE, TERNA, CBS, SISTEMAELECTRICO, GOV.UK



Annual BESS energy-capacity additions increased from 2.9 GWh in 2020 to 79 GWh in 2025 across the markets covered in the report's comparison.



Batteries enable solar electricity to be used beyond daylight hours, while reducing peak grid injections and curtailment.



Falling battery costs are accelerating storage deployment alongside PV.



Storage increasingly supports grid flexibility and stability, alongside demand-side management and other solutions.

Technology Developments

N-type technology

- N-type wafers represented around 82% of crystalline-silicon wafers used for cell manufacturing in 2025.
- Higher-efficiency cell technologies continue to gain market share.

PV module manufacturing

- 722 GW of modules produced globally in 2025.
- 1 531 GW/year of global manufacturing capacity.
- Persistent overcapacity and strong price competition.

Perovskite solar cells

- Pilot production is progressing towards GW-scale manufacturing.
- China could reach around 5 GW/year of announced perovskite production capacity by the end of 2026.
- High efficiencies have been demonstrated in research and pilot production.

Tandem solar cells

- Perovskite-silicon tandem technologies are progressing towards commercialisation.
- Reported laboratory cell efficiencies exceeding 34%.
- Further improvements in durability and large-area performance are needed.



PV Policy and Regulatory Developments



Evolving Support Schemes

- Shift from traditional feed-in tariffs towards self-consumption, net billing and market-based mechanisms.
- Investment subsidies and tax incentives increasingly target specific applications and market segments.



Grid Integration Regulations

- Grid constraints are leading to new connection rules and curtailment arrangements.
- Requirements for flexible connections, dynamic export limits and remote system control are expanding.



Prosumers and Energy Communities

- Self-consumption remains a major driver of distributed PV.
- Regulatory frameworks increasingly address electricity sharing, export remuneration and network charges.



Industrial and Trade Policies

- Domestic manufacturing incentives and local-content requirements are reshaping PV supply chains.
- Trade measures and sourcing conditions increasingly influence manufacturing and investment decisions.

The Changing Economics of PV



PV Competitiveness

- PV remains one of the most cost-competitive electricity generation technologies in many markets.
- Financing, permitting/grid connection and installation costs are important determinants of project economics.



Electricity Market Value

- In markets with high PV penetration, low or negative electricity prices occur during periods of high solar generation.
- This can reduce revenues for PV projects and increase the importance of flexibility.



Flexibility and Revenue

- Battery storage, flexible demand and sector coupling can help increase the value of PV electricity.
- Business models including PPAs, revenue stacking with flexibility components, self-consumption and aggregated distributed PV are used around the world

Outlook: The Next Phase of PV Growth



- Continued PV deployment will increasingly depend on effective grid integration, appropriate policy frameworks and business models that reflect changing electricity market conditions.
- Storage, demand flexibility and complementary technologies can help PV make a greater contribution to electricity systems as penetration increases.



Want to know more?

If you are interested in more insights and detailed data, explore the full [Trends in Photovoltaic Applications 2026 report](#).

About IEA PVPS Task 1

Task 1 supports the global deployment of PV by analysing market trends, policy drivers, and industry developments. It provides comprehensive reports like *Snapshot of Global PV Markets* and *Trends in PV Applications*, helping stakeholders make informed decisions.

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Photo Front Page:
Ground-mounted PV installation in
Ciudad Real, Spain, Picon II.
Image credits UNEF