India Becomes the World’s Second-Largest Solar Growth Market

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Why in news: According to the latest International Renewable Energy Agency (IRENA) report, India added 37 GW of solar capacity in 2025, compared with 34 GW added by the US, making India the world’s second-largest solar growth market. China remained the largest, adding 315 GW during the year.

Key Highlights of the IRENA Report

For the first time, India emerged as the world’s second-largest solar growth market in 2025, underscoring the rapid expansion of its **renewable energy** sector and its growing role in the global clean energy transition.

Solar Capacity Additions (2025):

- India added over 37 GW of solar capacity in 2025, surpassing the United States (34 GW) to become the world’s second-largest solar growth market.
- China remained the global leader, adding nearly 315 GW of solar capacity in a single year.

- Global solar power capacity increased by 512 GW, rising from 1,880 GW in 2024 to 2,392 GW in 2025.

India’s Installed Solar Capacity:

- India’s installed solar capacity increased from 98.5 GW in 2024 to 135.5 GW in 2025, registering a growth of nearly 37 GW in one year.
- During the same period, the United States expanded its solar capacity from 177.6 GW to 211.6 GW.

Solar Power Generation:

- India overtook Japan to become the world’s third-largest solar power producer in 2025.
- India generated 108,494 GWh of solar electricity, compared to 96,459 GWh generated by Japan.

Overall Renewable Energy Installed Capacity (December 2025):

- India ranked third globally in total renewable energy installed capacity with 250.52 GW.
- China retained the top position with 2,258.02 GW, followed by the United States with 467.92 GW.
- India surpassed Brazil (228.20 GW) and Germany (199.92 GW) in renewable energy capacity rankings.

Rank	Country	Renewable Energy Capacity (GW)
1	China	2,258.02
2	United States	467.92
3	India	250.52
4	Brazil	228.20
5	Germany	199.92

India’s Solar Growth Trajectory

India’s solar sector has witnessed unprecedented growth over the last decade, with the pace of capacity addition accelerating significantly in recent years.

Milestone	Time Taken
2.7 GW (2014) to 50 GW	96 months
50 GW to 100 GW	36 months

100 GW to 150 GW	14 months

Other Key Milestones:

- India added a record 44.6 GW of solar capacity in FY 2025-26, compared to 23.8 GW in FY 2024-25.
- Installed solar capacity increased from 98.5 GW in 2024 to 135.5 GW in 2025.
- India added 55.3 GW of non-fossil fuel capacity during FY 2025-26.
- In July 2025, renewable energy met 51.5% of India's electricity demand of 203 GW, marking the highest-ever renewable share in power generation.
- India achieved 50% of its installed power capacity from non-fossil fuel sources ahead of its **Paris Agreement** commitment.

Factors Driving Solar Growth

India's rise as the world's second-largest solar growth market has been driven by strong policy support, expansion of solar infrastructure, promotion of domestic manufacturing, and continuous technological innovation.

PM Surya Ghar: Muft Bijli Yojana: Launched in 2024, it aims to install rooftop solar systems on 1 crore households and provide up to 300 units of free electricity per month.

- Outlay: ₹75,021 crore
- More than 32 lakh households benefited by March 2026
- Rooftop solar capacity reached 4,946 MW by July 2025

Production Linked Incentive (PLI) Scheme: The scheme promotes domestic manufacturing of solar modules and cells to reduce import dependence.

- Outlay: ₹24,000 crore
- Created 18.5 GW solar module manufacturing capacity
- Attracted ₹52,900 crore investment and generated 44,400 jobs

Solar Parks and Ultra Mega Solar Power Projects: Provides land, transmission connectivity, and other infrastructure for large-scale solar projects.

- 50 Solar Parks sanctioned across 12 States
- Total sanctioned capacity: 37,990 MW

Green Energy Corridors (GEC): The Green Energy Corridor (GEC) programme develops dedicated transmission infrastructure to transport electricity from renewable energy-rich states such as Rajasthan and Gujarat to major consumption centres across the country, ensuring seamless integration of solar and wind power into the national grid.

- GEC Phase-II aims to establish 10,750 circuit km of transmission lines and 27,500 MVA of substation capacity.
- By March 2025, 9,161 circuit km of transmission lines and 21,925 MVA of substation capacity had already been completed.

- Future GEC Phases III and IV are planned to facilitate the evacuation of an additional 150 GW of renewable energy.
- GEC-III, proposed in the Union Budget FY26, is expected to involve an investment of around ₹56,000 crore.

PM-KUSUM Scheme: PM-KUSUM promotes the solarisation of agriculture through solar pumps and feeder solarisation, helping farmers reduce energy costs and earn additional income.

- Over 9 lakh standalone solar pumps installed.
- More than 9.7 lakh feeder-level solarisation pumps completed.
- Reduces dependence on diesel and conventional electricity for irrigation.

Renewable Purchase Obligations (RPOs) and Domestic Content Requirement (DCR): These measures support both renewable energy demand and domestic manufacturing.

- RPOs require DISCOMs and large consumers to procure a specified share of electricity from renewable sources, ensuring steady demand for solar power.
- DCR promotes the use of domestically manufactured solar equipment, reducing import dependence and strengthening the solar manufacturing ecosystem.

Research and Innovation::India is making progress in next-generation solar technologies.

- IIT Bombay developed a 26% efficient perovskite solar cell.
- A 30.2% efficient perovskite-silicon tandem solar cell has placed India among global leaders in solar research.

Significance of This Achievement

India’s emergence as the world’s second-largest solar growth market marks a major milestone in its clean energy transition, strengthening its energy security, climate leadership, and economic competitiveness.

- **Energy Security**: Reduced dependence on imported fossil fuels enhances energy independence, improves the current account balance, and cushions the economy against global energy price volatility.
- **Climate Commitments**: Accelerates progress towards India’s Nationally Determined Contributions (NDCs), including the target of achieving 500 GW of non-fossil fuel capacity by 2030 and Net-Zero emissions by 2070.
- **Economic Growth**: Expansion of the solar sector generates employment, boosts domestic manufacturing, attracts investments, and supports the growth of green industries.
- **Sustainable Development**: Facilitates access to clean, affordable, and reliable energy while contributing to environmental sustainability and inclusive growth.
- **Global Leadership**: Positions India as a leading renewable energy power and demonstrates that rapid industrialisation and clean energy expansion can advance simultaneously.
- **Geopolitical Leverage**: Strengthens India’s influence in global climate governance and multilateral forums such as the UNFCCC, COP Summits, and the **International Solar Alliance** (ISA).
- **Technological Advancement**: Encourages innovation in solar manufacturing, energy storage, and next-generation technologies, enhancing India’s long-term competitiveness in the global clean energy sector.

Challenges Ahead

- **Grid Integration**: Rapid solar additions strain grid infrastructure; need for advanced storage and smart grid solutions.
- **Land Acquisition**: Large-scale solar parks face land availability and rehabilitation challenges.
- **Import Dependence**: Despite PLI push, India still imports significant volumes of solar cells and polysilicon (largely from China).
- **Financing Gap**: Mobilising capital at the scale needed (especially for distributed rooftop solar) remains a challenge.
- **Skewed State Distribution**: Rajasthan, Gujarat, and Tamil Nadu account for a disproportionate share of installations; lagging states need policy attention.
- **Waste Management**: Growing concerns about end-of-life solar panel disposal and recycling infrastructure.

Way Forward

- Accelerate domestic manufacturing of solar cells, wafers, and polysilicon to reduce import vulnerability and strengthen the supply chain.
- Strengthen grid infrastructure through investment in battery energy storage systems (BESS), pumped hydro, and smart grid technology.
- Promote Distributed Renewable Energy — expand rooftop solar in residential, commercial, and agricultural sectors.
- Ensure just transition by supporting states and regions with high fossil fuel dependency to shift toward renewables.
- Expand International Solar Alliance (ISA) initiatives to position India as a leader in global solar diplomacy.
- Develop a robust solar waste management policy in anticipation of large-scale panel decommissioning post-2030.
