

India Solar Manufacturing Digest: Trends, Insights & Pathways

Examining OEMs and Solar Product, Components,
Technology type wise development track and market
opportunity in India

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Key Highlights –Solar Manufacturing Industry in India

- Under the Union Budget 2025 the government allocated Rs. 1,500 Cr to India's Solar Power Grids.
- MNRE has introduced the "Solar Systems, Devices and Components Goods Order, 2025," setting mandatory standards for Solar Products.
- ALMM enlistment trend shows remarkable growth especially after reinstatement in 2024.
- The Government introduced duty cuts, PLI extension, R&D boost, critical mineral support to advance solar manufacturing.
- Effective from June 1, 2026, ALMM List- II for Solar PV Cells to be implemented.
- MNRE proposes lower module efficiency thresholds for ALMM Enlistment.
- TP Solar Ltd. Establishes India's largest single location solar manufacturing plant equipped with advanced technologies.

Research Base

ALMM and PLI: Catalysts Driving Competition and Innovation in PV Module Manufacturing

India's solar manufacturing sector has witnessed remarkable growth, driven by supportive policies and regulatory frameworks. Among these, the ALMM (Approved List of Models and Manufacturers) and PLI (Production Linked Incentive) schemes have emerged as game-changers. These initiatives are not only fueling competition but also fostering innovation, making the domestic industry more robust and globally competitive. The ALMM policy, introduced by the Indian government, aims to ensure quality compliance and promote the use of domestically produced solar modules.

With a total enlisted capacity of 73,572 MW as of January 2025 across 100 manufacturers, according to the ALMM report, the solar energy sector in India boasts several key players leading the charge in PV module domestic manufacturing. **Key players include** Waaree Energies Ltd., with a capacity of 11,919 MWs per year, capturing 16.20% of the total capacity. Tata Power Renewable Energy Ltd. follows closely with 7,942 MWs (10.79%) which includes its collaborations under CO ALMMs, and TP Solar Ltd. contributes 5,222 MWs (7.10%).

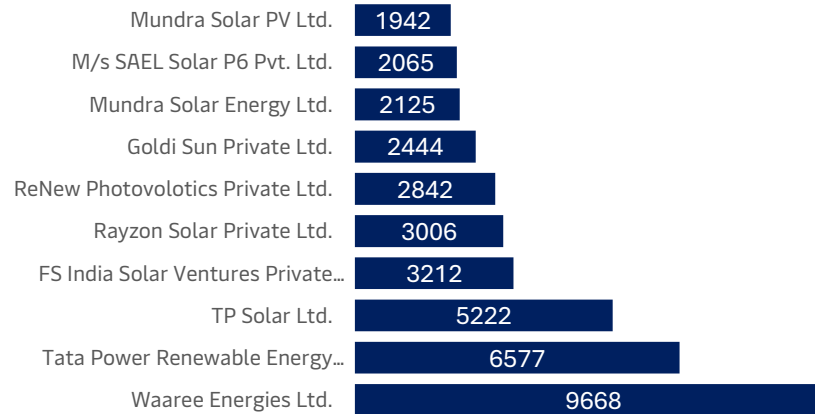
While ALMM ensures quality and credibility, PLI fosters scalability and technological advancement. This complementary approach has paved the way for the growth of a sustainable, self-reliant solar manufacturing ecosystem, aligning with India's goal of achieving energy independence. The Production-Linked Incentive (PLI) scheme for solar module manufacturing has been extended for another five years, with an enhanced outlay of Rs 24,000 crore. **The dual impact of ALMM and PLI has catalyzed innovation, prompting manufacturers to develop high-efficiency and next-generation solar modules.**

Emerging technologies, such as bifacial panels and advanced materials, are now becoming mainstream, driven by the incentives provided under these policies. The technology-wise distribution of these modules as of January 2025 highlights the dominance of Mono C-Si PERC, which accounts for 51.58% of the total enlisted capacity. Bifacial Mono C-Si PERC follows with a 20% share, indicating a strong shift towards high-efficiency bifacial modules. Mono N-Type TOPCon holds an 4.65% share, while Bifacial N-Type TOPCon accounts for 9.5%, showcasing the industry's move toward next-generation high-performance technologies. Looking ahead, the combined efforts of these initiatives will continue to position India as a leader in the global solar manufacturing sector.

Research Objectives

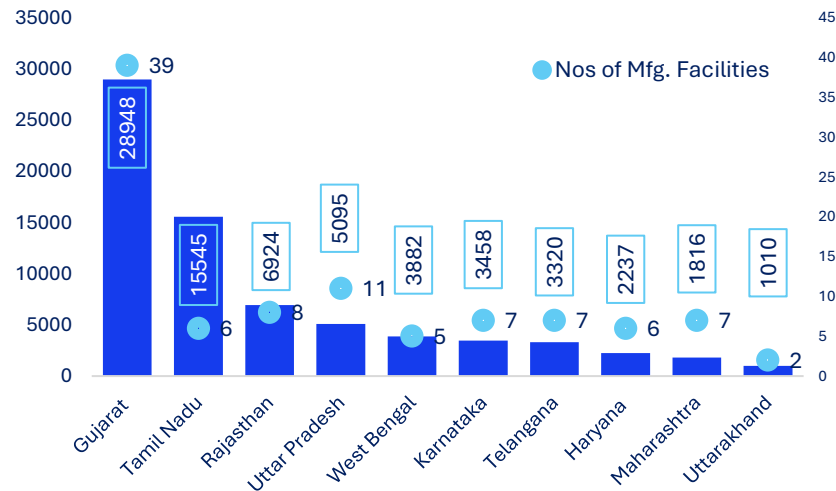
- Examining the Growth & Trends of the Solar Manufacturing Industry in India.
- Analysis of Technological Advancements in Solar PV Modules and Components.
- Investment opportunity examination in solar cell and panel production.
- Long term forecast exploring growth in capacity expansion of Solar Manufacturing in India till 2030.
- Player focused Investment prospectus and opportunities.
- Analyzing import dependency and export opportunities for Solar products and components.

Exhibit 01: Leading Players Enlisted PV Module Capacity (MW) As of Feb 2025



Source: MNRE, ALMM Lists

Exhibit 02: Leading States Solar PV Module Enlisted Capacity (MW) as of Feb 2025



Source: MNRE, ALMM Lists



Research Results

- Detailed research on market characteristics, key trends and outlook of each segment.
- Analysis on the shift to advanced technologies such as TOPCon
- Region wise outlook for final products and components for solar manufacturing industry in India.
- Detailed analysis of different regulatory and policy updates.
- Private and government investments in the solar PV modules and cells industry.
- Analysis on the Impact of Leading Players on the Solar Manufacturing Industry.

Research Case

Is India the next global solar manufacturing hub in the coming decade?

India Eyes \$1 Billion Boost to Spark Solar Manufacturing Revolution

India is well on its way to becoming a global leader in solar manufacturing, aligned with its ambitious renewable energy targets. The nation aims to achieve 500 GW of renewable energy capacity by 2030, with solar power expected to contribute over 60% of this total. The solar manufacturing sector in India is projected to grow significantly, with module production capacity.

The Indian government considers the solar manufacturing industry a crucial pillar of its renewable energy strategy and has implemented several supportive policies. The Production Linked Incentive (PLI) scheme, extended for another five years with an increased allocation of ₹24,000 crore, provides financial incentives to promote domestic production and attract investment in solar manufacturing.

To foster innovation in the solar sector, the Budget has allocated ₹1,500 crore for research and development in advanced solar technologies, such as perovskite solar cells, bifacial modules, and energy storage solutions. Import duties on waste and scrap of critical minerals like cobalt and lithium have been removed to lower raw material costs for solar manufacturing. Additionally, the budgetary allocation for the solar sector has risen from ₹150.61 billion to ₹242.24 billion, aimed at supporting the expansion and modernization of solar manufacturing facilities.

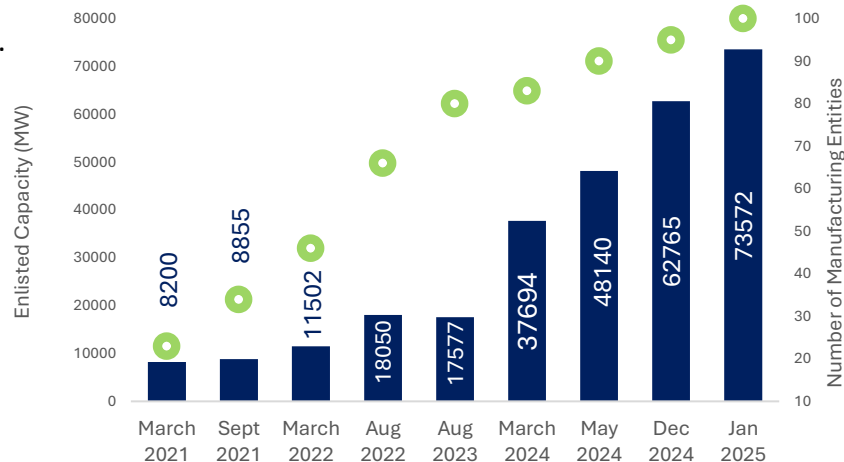
The Ministry of New and Renewable Energy (MNRE) has devised policies to establish a comprehensive ecosystem that minimizes import dependency while enhancing domestic capabilities. India is finalizing a \$1 billion capital subsidy plan to bolster its solar manufacturing industry, further amplifying its efforts in this sector. India's commitment to a sustainable energy future, coupled with its strategic investments in solar manufacturing and innovation, positions the nation to not only meet its ambitious targets but also play a key role in the global renewable energy landscape.

Solar Manufacturing in India: Growing center for Investments

India's solar equipment manufacturing sector is set for a ₹1 lakh crore investment surge over the next two to three years, driven by growth in polysilicon and wafer capacities. Some notable investments/ project in this sector are:

- Reliance Power to Invest Rs 10,000 Crore for Solar+ BESS in Andhra Pradesh. The project includes a 930 MW Solar Plant in Kurnool and an 1,860 MWh battery storage system along with an integrated Solar manufacturing plant.
- Jupiter International plans to invest ₹6,500 crore over three years. The investment will expand production capacities to 3 GW for wafers, 9.4 GW for Solar Cells, and 6 GW for Module assembly.
- Group Surya, headquartered in Bhubaneswar, Odisha, is investing ₹ 1,000 crore to set up a 1.2 GW Solar Module and cell manufacturing plant in Sasaram, Bihar.
- Grew Solar, part of the Chiripal Group, is investing Rs 2,800 crore to set up 3.6 GW of Solar Modules and 3 GW of Solar Cell manufacturing capacity in the next 12-14 months
- Airox Nigen Invests ₹800 Crore in Solar Manufacturing in Haryana. The 17-acre Renewable Energy Park in Rohnat will host a 600 MW Solar Module plant, scalable to 2 GW.

Exhibit 03: Approved List of Models and Manufacturers Trend from 2021-22, 2022-23, 2023-24 to Jan 2025



Source: MNRE, Eninrac Analysis

Key Observatory:

Following a temporary slowdown in module enlistments due to the suspension of the ALMM mandate until March 2024, enlistments rebounded swiftly post-April 2024 as manufacturers sought compliance with updated regulations. The reinstatement of ALMM accelerated approvals, driving rapid expansion in domestic solar manufacturing

According to industry estimates, the solar manufacturing sector is expected to grow by 18.90%, considering all market fluctuations, reaching approximately 177,368.60 MW by 2030. In a more optimistic scenario, similar to 2024—when the highest increase in enlisted capacity was recorded—the industry is projected to grow by 25.38%, reaching around 243,151.31 MW by the end of 2030. This represents a 287.31% growth from 2024-year end capacity of 62,765 MW over a 5-year period. Positive factors such as the Approved List of Models and Manufacturers (ALMM), government subsidies, and robust policy support are anticipated to drive this growth, serving as catalysts to boost solar manufacturing and reduce import dependency.



Must Buy For

- Solar Manufacturing Companies
- Research and Academic Institutions
- Policy Makers
- Energy Consultants and Analysts
- Investors and Venture Capitalists
- Solar Panel Installers and Distributors
- Solar Inverter Manufacturers
- Industry Associations
- Government & Regulatory Bodies
- Utility Solar Power Project Developers
- Government & Regulatory Bodies
- Funding Bodies/Banks

Key Queries Resolved

- What shall be in-store for India for solar panel Market?
- Examining the market opportunity for the solar manufacturers in India.
- Examining the regulations and policy effects on the Indian solar ecosystem.
- What shall be the key drivers and barriers to robust market growth?
- What shall be the investment opportunities in different segments of solar manufacturing industry?
- What shall be the investment opportunities in different segments of solar manufacturing industry?
- Identify regional opportunity pockets for solar module manufacturers in India.
- What shall be the market opportunity for inverter manufacturers?
- Examining the role of domestic solar manufacturing for energy transition in India.
- Competitive profiling of major solar modules, solar cells, inverter manufacturers in India.

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