

Waaree Energies Ltd.

Industry: Solar Photovoltaic (PV) module manufacturers

Rating
SUBSCRIBE

Date: 18th October, 2024

Issue Highlights

Waaree Energies Ltd IPO is a book built issue of Rs. 4,321.44 crores. The issue is a combination of Offer for Sale and Fresh Issue.

- The Fresh Issue consists of 2.4 crore shares aggregating to Rs. 3,600 crores at the upper end of the price band at Rs. 1,503 per share.
- The Offer for Sale consists of 0.48 crore shares aggregating to Rs. 722.41 crores at the upper end of the price band at Rs. 1,503 per share.

Objects of the Offer are: The net proceeds of the Fresh Issue are to be utilised in the following manner:



Particulars	Rs. Cr
Part finance the cost of establishing the 6GW of Ingot Wafer, Solar Cell and Solar PV Module manufacturing facility in Odisha, India by way of an investment in the wholly owned subsidiary, Sangam Solar One Private Limited ("Proposed Project").	2,775.00
General Corporate Purposes*	[•]
Total	[•]

* The amount utilized for general corporate purposes shall not exceed 25% of the Gross Proceeds

21st
Oct 2024
ISSUE OPENS

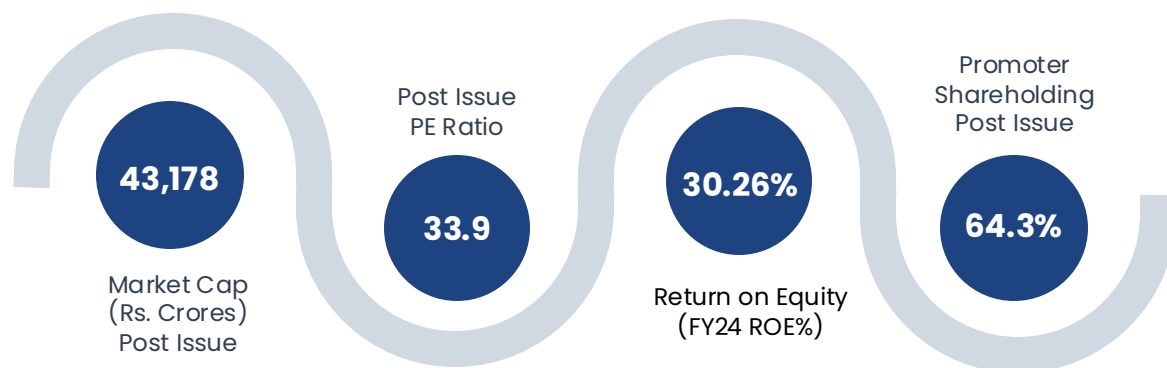
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ISSUE CLOSES

ISSUE DETAILS	
Price Band	₹1,427 to ₹1,503 per share
Face Value	₹10 per share
Total Offer Size	28,752,095 shares (aggregating up to ₹4,321.44 Cr)
Fresh Issue	23,952,095 shares (aggregating up to ₹3,600.00 Cr)
Offer For Sale	4,800,000 shares of ₹10 (aggregating up to ₹721.44 Cr)
Issue Type	Book Built Issue IPO
Minimum lot	9 shares
Listing on	BSE, NSE

Outlook

- With an installed capacity of 13.3 GW, Waaree Energies stands as India's largest solar photovoltaic (PV) manufacturer.
- The nation's ambitious goal of net-zero emissions has spurred rapid adoption of solar energy, with total installed capacity projected to reach 142 GW by 2029, presenting a robust demand outlook for Waaree's products.
- The company faces direct competition from two listed peers, Websol Energy Services Ltd and Premier Energies Ltd, in a market dominated by private players.
- This IPO offers a concept-driven investment opportunity, and we anticipate potential traction and listing gains.
- We have issued a "SUBSCRIBE" rating for Waaree Energies Ltd's IPO for listing gains.



Indicative Timeline

On or before

Finalization of Basis of Allotment	Thursday, October 24, 2024
Unblocking of Funds	Friday, October 25, 2024
Credit of shares to Demat Account	Friday, October 25, 2024
Listing on exchange	Monday, October 28, 2024

IPO Reservation

QIB Shares	Not more than 50.00% of the Offer
HNI Shares	Not less than 15.00% of the Net Issue
Retail Shares	Not less than 35.00% of the Net Issue

Lot Size

Application	Lots	Shares	Amount
Retail (Min)	1	9	₹13,527
Retail (Max)	14	126	₹1,89,378
S-HNI (Min)	15	135	₹2,02,905
S-HNI (Max)	73	657	₹9,87,471
B-HNI (Min)	74	666	₹10,00,998

Company Overview

Waaree Energies Ltd, established in 2007, is the largest manufacturer of solar photo voltaic (PV) modules in India with an aggregate installed capacity of 13.3 GW as of October 14, 2024, which is 3x its closest competitor. Waaree Energies operates five advanced manufacturing facilities with automated production lines located at Surat, Tumb, Nandigram and Chikhli in Gujarat and an IndoSolar facility located in Noida, Uttar Pradesh. The facility in Tumb is equipped with an NABL (National Accreditation Board for Testing and Calibration Laboratories) accredited laboratory. The product portfolio of Waaree Energies consists of multicrystalline modules, monocrystalline modules and TopCon (Tunnel Oxide Passivated Contact) modules, comprising flexible modules, which includes monofacial and bifacial modules (Mono PERC) (framed and unframed), and building integrated photo voltaic (BIPV) modules. Waaree Energies is included in the ALMM (Approved List of Modules and Manufacturers) list, with a listed capacity of 11.92 GW (as of Sep 24), which enables it to participate in various schemes rolled out by the Government of India (GoI). Apart from this, the solar PV manufactured by Waaree Energies have been provided with certificate of conformity by Eurotech Assessment and Certification Services Ltd as per the requirements provided under EU Council's directive. In addition, the solar PV modules are also RoHS (Restriction of Hazardous Substances) compliant which restricts the use of hazardous substances in electrical and electronic equipment. The company has built a solid international presence, particularly the US, from where it derives a sizeable portion of its revenues. Waaree Energies Ltd also has two of its subsidiaries, namely, Waaree Renewable Technologies Ltd (WRTL) and Indosolar Ltd which was acquired through insolvency route but currently suspended from being traded, listed in the stock exchanges.

- **Domestic and overseas capacity expansion:** Waaree Energies commissioned a 1.3 GW Indosolar facility following the end of Q1FY25; the overall capacity after this addition stood at 13.3 GW. The company is also in the process of setting up 5.4 GW solar cell capacity which is expected to be operational by the end of FY25. Further, Waaree Energies, through its subsidiary Waaree Solar Americas Inc., is setting up a 1.6 GW module manufacturing facility which is also expected to be operational by the end of FY25. The company has tentatively proposed plans to scale up its US operations to 3 GW by FY26 and to 5 GW by end of FY27. Additionally, the company has proposed to set up a fully integrated 6 GW facility to manufacture ingots, wafers, solar cells and PV module in India by FY27, which would take its overall module manufacturing capacity in India to 19.3 GW. Apart from this, Waaree Energies has proposed to add a separate 6 GW solar cell capacity and 6 GW ingot-wafer capacity by FY27.
- **Strong Order Book:** As of June 30, 2024, its pending order book for solar PV modules was 16.66 GW which included domestic orders, export orders, and franchisee orders and 3.75 GW of orders for its Subsidiary, Waaree Solar Americas Inc. located in the United States.
- **Largest Exporter of Solar PV modules from India:** Waaree Energies is the largest exporter of solar PV modules from India accounting for 46% (2.1 GW) in FY24 and 60% (1.9 GW) in FY23. US market accounted for the major portion of Waaree's export revenues. The contribution of exports to US as a percentage of total exports in Q1FY25, FY24, FY23, FY22 was 100%, 89.56%, 99.6%, 98.67% and 98.3% respectively. Going forward, the company plans to increase its exports sales further by diversifying to non-US markets.

- **Implementation of strategic backward integration:** Waaree Energies intends to implement comprehensive backward integration measures by commencing manufacture of solar cells, a critical component in the manufacture of solar panels, in order to reduce dependence on imported solar cells and third party solar cell manufacturers in India. This backward integration would also result in cost savings and thereby improve profit margins. Waaree expects to operationalize 5.4 GW of solar cell manufacturing by the end of FY25 with further 6 GW expected to be operationalized by FY27.
- **Scaling operations through inorganic route:** The company is planning on extending the scope of its business by setting up a gigawatt scale electrolyser manufacturing facility. It is in the process of finalizing a technology tie up for local manufacturing and is likely to firm up arrangements by the end of FY25 and expected to roll out manufactured electrolysers by the end of FY26. Apart from this, the company has entered into an agreement with Dhari Solar Park Private Limited (Group Company) to acquire a 36MWp solar power project (yet to be commissioned) for a maximum consideration of Rs. 125 crores.
- **Focus on technology:** The solar PV market has seen an increase in demand for advanced technologies with better efficiency, such as, MonoPERC and TopCon. While the existing product mix is majorly based on multicrystalline and monocrystalline technology, the company intends to increase production of monocrystalline modules and TOPCon before completely transitioning its entire module manufacturing to TOPCon.
- **Pan India Retail Network:** Waaree Energies has established an extensive retail network in India with 369 franchisees operating across India. Availability of local contact, through an appointed franchisee, is very important in reaching out to residential, commercial, and industrial consumers and presents a significant entry barrier to competitors targeting local rooftop and MSME business verticals.
- **Leadership in commercial and industrial, and residential business verticals:** Waaree Energies, with its extensive pan India retail network, is already a major player in the rooftop and MSME business verticals. In a bid to further strengthen its position, Waaree intends to further increase its presence in states with high growth potential for rooftop installations, particularly the state of Delhi, Gujarat, Maharashtra, Andhra Pradesh, Telangana, Karnataka and Tamil Nadu. These states have a high industrial and commercial load, with higher distribution company tariffs, and clearly defined regulations for net/gross metering regulations, and are regions with higher potential for generating solar energy.
- **Consistent financial performance:** The company's capacity expansion from 2GW in FY21 to 12 GW by the end of FY24 has resulted in substantial increase in revenues from operations which witnessed growth at a CAGR of 99.83% from Rs. 2,945.85 crores in FY22 to Rs. 11,397.61 crores in FY24. During the same period EBITDA margins witnessed a significant improvement from 6.88% to 18.30% on account of continued efficiency improvements, improved productivity and cost rationalization.
- **Experienced senior management team:** Waaree Energies is expertly guided by a leadership with extensive industry experience in the field of engineering. Mr. Hitesh Chimanlal Doshi, Chairman and Managing Director, part of the promoter group, boasts of 23 years of experience in engineering while Mr. Viren Chimanlal Doshi, another member of the promoter group and Whole Time Director has extensive experience of more than 15 years in the field. Mr. Hitesh Pranjivan Mehta who is responsible for leading the company's short term and long-term strategy setting is a Chartered Accountant with 24 years of experience in the field of engineering, solar and oil industries.

Capability Matrix

- 1. Photo-voltaic (PV) modules:** Waaree's solar PV modules are manufactured using multicrystalline cell technology, monocrystalline cell technology and emerging technologies such as Tunnel Oxide Passivated Contact ("TOPCon") which helps reduce energy loss and enhances overall efficiency. Its portfolio of solar energy products consists of the following PV modules:
 1. Multicrystalline modules;
 2. Monocrystalline modules; and
 3. TOPCon modules, comprising flexible modules, which includes bifacial modules (Mono PERC) (framed and unframed), and building integrated photo voltaic (BIPV) modules.

A brief description of Solar PV modules offered by Waaree Energies include:

- **Monofacial modules (Multicrystalline and Mono PERC):** Monofacial modules have only one side of solar cells collecting and converting light to electricity. They do not require reflective surfaces and special mounting equipment for installation, and it is sufficient that the solar cells are facing the sun. Waaree Energies manufactures monofacial modules with both multicrystalline and mono PERC technology in different sizes and wattage..
 - **Building Integrated photo voltaic (BIPV) modules (Mono PERC):** Building integrated photo voltaic (BIPV) modules are used to replace conventional building materials in parts of the building envelope such as the roof, skylights or facades. Waaree Energies manufacture them with Mono PERC technology and are ideal for green building applications.
 - **Flexible modules:** It also manufacture flexible panels for sale to domestic and global customers.
- 2. EPC and O&M Solutions:** Waaree Energies provides EPC solutions as a contractor. Its EPC solutions include setting up of ground mount, rooftop and floating solar projects for commercial and industrial and institutional projects across India. Waaree Energies has over 10 years of experience as an EPC contractor with a track record of 1.82 GW of projects commissioned, including over 178 rooftop projects commissioned and 2.19 GW of projects under execution, as of June 30, 2024. Apart from this, it also provides rooftop solar solutions for residential customers. It is also involved in the O&M space by undertaking maintenance and repair of solar power plants.

Risks



- Customer Concentration Risk:** Waaree Energies' depends on certain key customers for a major share of its business. The contribution of its single largest customer as a percentage of revenue from operations for Q1FY25, FY24, FY23 and FY22 was 18.23%, 8.91%, 15.95% and 18.35% respectively. The contribution of top 10 customers for the same periods, on the other hand, stood at 58.41%, 56.77%, 65.90% and 42.78%.
- Raw material procurement:** Waaree Energies is dependent on third parties for supply of various materials, such as, solar cells, backsheets, encapsulants, glass, busbar etc. The company has not entered into any formal long-term contracts for these products thus exposing it to price volatility.
- Dependence on imports for raw materials:** The Raw Material requirement of the company is primarily satisfied by way of imports from China, Vietnam, Malaysia and Thailand, with China accounting for majority of imports . Any restriction placed on such imports would have a substantial impact on the cost structure of the company. For instance, The Govt, in FY22, introduced a basic customs duty of 25% for import of solar cells which significantly impacted the raw material costs of the company. The cost of imports as a percentage of total cost for Q1FY25, FY24, FY23, FY22 was 98.09%, 90.41%, 92.80%, 85.88% respectively. Whereas, the share of imports from China as a percentage of total cost for Q1FY25, FY24, FY23, FY22 was 84.90%, 54.08%, 34.46%, 80.23% respectively.
- Exports Concentration Risk:** Waaree derives a significant portion of its revenue from operations from exports with the US accounting for substantially all of its export revenues. The share of exports as a percentage of total revenue from operations for Q1FY25, FY24, FY23 and FY22 was 39.31%, 57.64%, 68.38% and 23.05% respectively. While, the exports to US as a percentage of total exports for Q1FY25, FY24, FY23 and FY22 was 100%, 99.60%, 98.67% and 98.30% respectively.
- Risk relating to non fulfillment of conditions attached to Government Subsidy :** Waaree Energies has been awarded Rs. 1,923 crores under the National Programme on High Efficiency Solar PV Modules ("PLI Scheme") for the proposed 6GW integrated ingot-wafer, solar cell and module manufacturing facility to be set up in Odisha. This award under PLI scheme is subject to conditions such as commissioning of facility before April 18, 2025, meeting target capacity and maintaining minimum module performance. However, the company expects commissioning of this plant in FY27 and has applied for an extension to this extent. In the event that such extension isn't granted, the award under PLI could be reduced.

Risks

- **Retail Sales Concentration Risk:** A substantial portion of retail sales was generated in Gujarat. Retail sales account for ~20% of total revenues . This geographic concentration exposes Waaree’s business to risks which may be induced by any change in the local environment. The sales from Gujarat as a percentage of total retail sales for Q1FY25, FY24, FY23, FY22 was 36.52%, 37.12%, 44%, 33.14% respectively.
- **Concentration of Manufacturing Capabilities:** Waaree Energies operates five manufacturing facilities of which four are located in the state of Gujarat, India. Due to this geographic concentration, manufacturing operations are susceptible to disruptions caused by local and regional factors, including agitations, accidents, system failures, economic and weather conditions, natural disasters, demographic factors, and other unforeseen events and circumstances.
- **Risk related to competitive bidding for solar projects, EPC and O&M:** The company bids for solar projects through its subsidiaries, which exposes it to certain execution risks such as delay in execution and cost overruns resulting in levy of damages and revenue loss. As of June 30,2024, the company had 46 active power purchase agreements. Waaree also bids for EPC and O&M project through competitive bidding where the projects are awarded based on prescribed criteria. The bids participated in Q1FY25, FY24, FY23, FY22 was 5, 20, 14, 34 respectively while the percentage of bids won in Q1FY25, FY24, FY23, FY22 was 0%, 50%, 20%, 21.43% and 0% respectively.



Financials

Income Statement (Rs. Cr)	Q1FY25	FY24	FY23	FY22
Revenue from Operations	3,408.9	11,397.6	6,750.9	2,854.3
Other Income	87.5	235.2	109.5	91.6
Total Income	3,496.4	11,632.8	6,860.4	2,945.9
Expenses	2,856.4	9,823.2	5,916.2	2,743.3
EBITDA	640.0	1,809.6	944.1	202.5
Depreciation	75.8	276.8	164.1	43.3
EBIT	564.2	1,532.8	780.0	159.3
Finance Cost	33.7	139.9	82.3	40.9
PBT	530.5	1,392.9	697.7	118.4
Tax	129.4	459.8	176.9	38.7
PAT	401.1	933.0	520.9	79.6
EPS (In Rs.)	15.0	48.1	21.8	3.8

Notable Ratios

Particulars	Q1 FY25	FY24	FY23	FY22
EBITDA Margins (%)	18.77%	15.88%	13.99%	7.10%
Return on Equity (RoE%)	8.79%	30.26%	26.26%	17.69%
Return on average capital employed	9.56%	36.95%	48.83%	23.49%

Balance Sheet (Rs. Cr)	Q1FY25	FY24	FY23	FY22
Equity And Liabilities				
Share Capital	263.1	263.0	243.4	197.1
Other Equity and Reserves	4,289.3	3,885.5	1,618.5	242.7
Borrowings	1,440.4	1,652.6	1,204.7	509.2
Other Liabilities	5,996.7	5,512.6	4,353.4	1,288.3
TOTAL EQUITY AND LIABILITIES	11,989.5	11,313.7	7,419.9	2,237.4
Assets				
Fixed Assets	1,601.9	1,449.8	1,105.3	624.6
CWIP	1,610.3	1,341.4	537.2	123.8
Cash & Cash Equivalents	3,785.7	3,779.2	1,736.4	366.4
Other Assets	4,991.6	4,743.3	4,041.0	1,122.7
TOTAL ASSETS	11,989.5	11,313.7	7,419.9	2,237.4

Notable Ratios

Particulars	Q1FY25	FY24	FY23	FY22
Inventory Days	96	111	115	71
Debt to Equity ratio	0.06	0.08	0.15	0.72
Order book in GW	16.66	19.93	18.06	3.28

Disaggregation of revenue from operations

Particulars	Q1FY25		FY24		FY23		FY22	
	Rs. Cr	%	Rs. Cr	%	Rs. Cr	%	Rs. Cr	%
	Direct sales to utilities and enterprises	1,341.0	39.34%	3,581.4	31.42%	1,316.8	19.51%	1,596.3
Export Sales	1,340.1	39.31%	6,569.1	57.64%	4,616.5	68.38%	657.8	23.05%
Retail Sales	698.1	20.48%	1,157.1	10.15%	672.5	9.96%	582.5	20.41%
Other revenue from operations	297.1	8.72%	90.0	0.79%	145.0	2.15%	175.8	6.16%
Total	3,408.9		11,397.6		6,750.9		2,854	

Top 1,5 & 10 Customers

Particulars	Q1FY25		FY24		FY23		FY22	
	Rs. Cr	% of Rev	Rs. Cr	% of Rev	Rs. Cr	% of Rev	Rs. Cr	% of Rev
Top 1 Customer	621	18.23%	1,016	8.91%	1,077	8.91%	524	8.91%
Top 5 Customers	1655	48.56%	4,575	40.13%	3,520	40.13%	960	40.13%
Top 10 Customers	1991	58.41%	6,472	56.77%	4,449	56.77%	1,221	56.77%

Top 5 & 10 Suppliers

Particulars	Q1FY25		FY24		FY23		FY22	
	Rs. Cr	% of Rev	Rs. Cr	% of Rev	Rs. Cr	% of Rev	Rs. Cr	% of Rev
Top 5 Customer	1,066	35.95%	4,811	46.98%	3,593	80.05%	838	29.57%
Top 10 Customers	1,614	54.42%	6,087	59.44%	4,933	40.13%	1285	45.37%

Installed Capacity at the end of each period and products manufactured

Manufacturing Facility	Q1FY25	FY24	FY23	FY22	Products Manufactured
Surat Facility	0.23	0.23	0.23	0.23	Multicrystalline modules and monocrystalline modules
Tumb Facility	1.00	1.00	1.00	1.00	
Nandigram Facility	1.11	1.11	1.28	0.50	Multicrystalline modules; monocrystalline modules; TOPCon modules comprising flexible modules, which includes bifacial modules (Mono PERC) (framed and unframed), and building integrated photo voltaic (BIPV) modules
Chikhli Facility	9.66	9.66	6.49	2.00	
IndoSolar Facility*	-	-	-	-	
Total	12.00	12.00	9.00	4.00	

*Waaree Energies has commissioned a 1.3 GW IndoSolar facility in Noida, Uttar Pradesh following Q1FY25.

Key Competitive Strengths of Peers

Company Name	Manufacturing Facilities	NABL Accredited Lab	Module Manufacturing Capacity*	Cell Manufacturing Capacity*	Enlisted ALMM Capacity (as on Sep' 24)	Market Share**	Under Construction Capex
Waaree Energies Ltd	4 in Gujarat and 1 in Noida, Uttar Pradesh	For modules	12 GW	-	11,919 MW	21.09%	6 GW module and 5.4 GW cells Proposed: 6 GW solar module, 6 GW cells, 6 GW ingot-wafer capacity
Vikram Solar	1 each in West Bengal and Tamil Nadu	For modules	3.5 GW	-	2,250 MW	7.20%	Proposed: 7 GW module and 3 GW integrated cell and modules
RenewSys India	1 each in Karnataka, Telangana and Gujarat	For Encapsulants and Backsheet	2.75 GW	~0.1 GW	1,636 MW	2.90%	2 GW module
Websol Energy Systems Ltd	1 in West Bengal	-	550 MW	-	NA	NA	1.2 GW cells
Mundra Solar PV Ltd	1 in Gujarat	-	4 GW	-	4,067 MW	6.74%	10 GW cell and module
Premier Energies Ltd	2 in Telangana	-	4.1 GW	2 GW	2,561 MW	4.53%	1 GW module, 1 GW cell
Emmvee Photovoltaic	2 in Karnataka	-	3.5 GW	-	2,692 MW	4.76%	1.75 GW including 1.5 GW wafer to module

Module and Cell manufacturing capacity as on June-24 | Market share is based on the ALMM capacity

Financial Indicators of Peers as of FY24

Company Name	Operating Income	OPM%	NPM%	ROE%	ROCE%
Waaree Energies Ltd	11,398.0	14%	11%	26%	30%
Vikram Solar	2,511.0	10%	3%	23%	18%
Tata Power Solar Systems Ltd	11,726.0	6%	3%	39%	27%
Websol Energy Systems Ltd*	259.0	-572%	-468%	-16%	-112%
Mundra Solar PV Ltd**	1,564.0	3%	-22%	-2%	-70%
Premier Energies Ltd	3,143.8	15%	7%	25%	36%

*Websol Energy Systems Ltd discontinued operations following decision to graduate to superior technology | **Mundra Solar PV Ltd - all data in the above table pertains to FY23

Date: 10th October 2024

Industry Outlook

The global electricity demand has grown at a CAGR of 2.3% from 25,027 TWh to 27,882 TWh between 2019 and 2023. The demand for 2023 witnessed a growth of 3.4% YoY (+903 TWh) with China, US and India accounting for 90% of global demand growth. To reduce the greenhouse emissions from such ever-growing power demand, International Energy Agency (IEA) released the Net Zero Emissions roadmap named Net Zero by 2050. Renewable energy generation is required to grow by an average 25% between 2022 to 2030 to meet the emissions targets by 2050. Since emission targets were laid, solar PV has fast become the preferred and low-cost option to achieve those targets.

The global solar capacity as of 2023 stood at 1,411 GW. The solar market is dominated by China which accounts for about 43% of the global installed capacity, while key European countries control about 18% of the total solar PV installed capacity. China's role in the supply chain is extremely critical as it holds close to 75% of global cell and module lines. In 2022, global solar PV manufacturing capacity increased by over 70% to reach almost 450 GW, with China accounting for over 95% of new facilities throughout the supply chain. Global PV shipments during 2022 crossed 300 GW, of which the top 10 players, which included Chinese manufacturers such as LONGi Solar, Trina Solar, Jinko Solar, accounted for approximately 80% in shipments.

Countries around the world have implemented policies to ensure fulfillment of renewable energy commitments. The US Inflation Reduction Act has allocated USD 400 billion (Rs 33.2 lakh crores) for clean energy. Manufacturers in US who produce eligible components can avail tax credit under Section 45X. This is expected to benefit manufacturers across the solar value chain. The US enacted ULFP Act, 2022, under which importers are required to prove that the goods were produced without forced labour. This requirement extends to goods that are entirely or partially manufactured in the Xinjiang Autonomous Region ("XAJR"). China Plus One strategy is becoming increasingly popular in solar industry as companies look to reduce their dependence on China and diversify their supply chains. The ULFP Act and China Plus One strategy have made the US market exceedingly profitable for non-China solar module manufacturers. However, in 2022, the US Department of Commerce determined that some solar cell manufacturers in South Asian countries using input from China were evading anti-dumping duty. As a result, anti-circumvention duty as high as 254% could be imposed on solar cells imported from the Southeast Asian countries.

The electricity requirement of India grew at a CAGR of 4.4% from 1069 BU (billion units) in FY15 to 1512 BU in FY23. During the same period, power availability rose at approximately 5.1% CAGR on the back of strong capacity additions. Looking forward, power demand in the country is expected to log a healthy 5% to 7% CAGR between FY24 and FY29, with the growth trajectory sustaining above the long-term historical growth rate of 5% over the next six years with solar playing a crucial role in meeting the surge in power demand. In per capita terms, the consumption in India stood at 1,331 kWh in FY23 while expectation is that by 2029 the per capita consumption would reach 1,600 kWh to 1,650 kWh.

At the 26th session of the United Nations Framework Convention on Climate Change (COP 26), India announced that it aims to reach net zero emissions by 2070. Forecasts by CRISIL indicate that India will almost double its renewable power capacity between 2022 and 2027, with solar PV accounting for three-quarters of this growth. Under the National Infrastructure Pipeline, investments to the tune of Rs. 21.5 lakh crores are expected to flow into the power sector between FY24 and FY28, of which, 66% or Rs. 14.1 lakh crores is expected to flow into renewables.

India has around 750 GW of solar potential, however, only around 10% of the potential is developed and balance 90% potential yet to be exploited. This provides huge opportunities for solar development. As of August 2024, the installed solar capacity was 89.43 GW with approximately 70 GW of this solar capacity being commissioned between FY18 to FY24. The government had proposed to achieve 100 GW of solar energy by FY26, of which 40 GW was proposed to be added under rooftop-based solar systems. Rooftop projects are small-scale PV installations on roofs of buildings which may or may not be connected to the grid. The rooftop solar segment in India is dominated by Commercial & Industrial ("C&I") consumers, accounting for over 70% to 80% of the total market. CRISIL expects that India will add 137 to 142 GW of solar capacity by FY29.

Industry Outlook

India's module manufacturing capacity as of FY24 was 63 GW while cell manufacturing capacity stood at 13 GW. India aims to build its presence across all stages of PV manufacturing over the next two to three years (FY24 to FY27). In November 2020, the GoI introduced the PLI scheme for manufacturing high-efficiency solar PV modules with a financial outlay of Rs. 4,500 crores. It later enhanced the outlay by Rs. 19,500 crores under the Union Budget for FY23. CRISIL expects solar PV manufacturing capacity to reach 125 GW by FY29, with full integration from polysilicon to modules expected to account for 33% of capacity. Gujarat is expected to be the epicenter with the state expected to account for 55-60% of capacity additions over the next 5 FYs. Achieving this is expected to require an investment of Rs. 1.5 lakh crores by FY28.

The GoI has taken various regulatory steps such as Domestic Content Requirement (DCR), PLI scheme, levy of basic customs duty which aid solar PV manufacturers. The government has provided central financial assistance, viability gap funding for fulfillment of Domestic Content Requirement (DCR) requirements under various schemes such as CPSU, PM-KUSUM, grid connected solar programmes. DCR mandates the use of solar cells and modules manufactured in India. The National Program on High-Efficiency Solar PV Modules is a government-backed initiative to promote domestic manufacturing of Solar PV modules and cells in India. The PLI scheme offers incentives to eligible manufacturers based on their annual production of high-efficiency solar PV modules and cells. The scheme is expected to reduce India's dependence on imported solar modules, and to make solar power more affordable for Indian consumers. The GoI imposed a basic customs duty of 40% on solar modules and 25% on solar cells on April 1, 2022. The Approved Models and Manufacturers of Solar Photovoltaic Modules (ALMM), which was kept in abeyance, was reinstated in April 2024 to ensure the quality and performance of solar modules used in India. It is a list of solar cell and module types and manufacturers in India that have been certified by the Bureau of Indian Standards. Only modules that are listed on the ALMM are eligible for use in government sponsored solar projects.

India witnessed an explosive 26x growth in exports from Rs. 618 crores in FY22 to ~Rs. 16,100 crores in FY24. This increase was primarily due to the restrictions imposed by other countries on Chinese goods, including solar modules. These restrictions have created opportunities for Indian manufacturers to fill the gap in the global market and meet the demand for solar modules. Exports are expected to remain high between fiscal 2024 and 2028, reaching 25 GW. Export demand will also be supported by other key renewable energy markets, such as the Middle East, the European Union, and Latin American nations.

The global PV industry is witnessing a shift towards monocrystalline cell technology from polycrystalline cells. The share of monocrystalline technology in 2022 was about 97% (compared with 66% in 2019) of total crystalline silicon (c-Si) production. More than 85% to 90% of Indian solar module manufacturers have shifted to Mono-PERC and Mono-PERC is expected to dominate the technology for the next two to three years. However, in the coming years, it is expected that more advanced cell designs such as heterojunction ("HJT"), TOPCon, and back contact will gain greater market shares. However, currently, 80% to 85% of the solar modules need be imported as domestic capacity is inadequate to meet demand. India does not have a manufacturing base for polysilicon ingots and wafer; hence, companies currently import these components at higher costs.

The global renewable energy market is entering a phase of aggressive growth with solar playing a pivotal role in helping countries around the world achieve their goals towards net zero emission. Companies operating across the solar value chain in India are expected to benefit massively from considerable tailwinds induced by policy level support from government with initiatives such as domestic content requirement, PLI schemes, basic customs duty on imports. The China Plus One strategy is also expected to benefit Indian players massively, ensuring Indian companies do not just cater to the massive domestic market for renewables but are also active participants in the global thrust towards achieving sustainability in power generation.



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