Utilities & Power Equipment

100 GW+ of solar module capacity? Not Really

Around 40% of the current 100GW+ solar PV module manufacturing capacity will soon get obsolete driven by the technology shift to TOPCon and the changing market for higher efficiency and peak power output. Imminent integration of modules with cell, wafers and ingots, beginning Sep'25, has made scale and technology important for survival. So, manufacturers of highly fragmented modules not only need to expand their capacities but also need to accelerate backward integration. While numerous integrated (cell+module) facilities have been announced, we believe that a large number will either face delays or be shelved due to lack of capital and capabilities, moving the market toward oligopoly. Hence, the current 100 GW+ of manufacturing capacity is just nameplate capacity with utilisation of 45-55% (industry standard), resulting in supply of 40-50GWp modules vs. demand of 45-55GWp and a sustained oversupply scenario is unlikely in the near term.

- **What and how much do developers want?** India is likely to see around 35GW/year of solar power capacity addition in the next 3-4 years, requiring 45-55GWp of modules, considering the 1.3-1.5 DC to AC ratio, due to declining prices and integration of solar with storage. Module efficiency, peak power output (Wp), warranty and longevity and experience are key considerations that impact the buying decisions of developers/ utilities.
- **Fragmented market:** The 100GW+ of ALMM-enlisted module manufacturing capacity is spread across 82 players. Of these, 22 players have capacities above 1GW contributing 88GW (87% share). Almost half of remaining 60 smaller players (<1GW) were added since Aug'24, indicating limited experience and brand reputation.
- **Solar module efficiency**: Today's n-type TOPCon modules having 23%+ efficiency. The 37% of models from the large players have >21% efficiency. In contrast, 27% of models from small players still have <20% efficiency. Overall, just 11% of the models manufactured in India have efficiency of more than 22%.
- **Peak power output:** The utility-scale solar projects are now commonly requiring a minimum capacity of 550Wp. For example, the recent (Jul'25) tender from NTPC Renewables required crystalline solar PV bifacial modules with minimum 570Wp nominal rating. Among ALMM-enlisted models, just 48% models of large players (>1GW) are more than 500Wp vs. 32% for small players (<1GW).
- **PV technology:** Solar PV technology is moving away from PERC to TOPCon. Globally, the market share of TOPCon is expected to increase from 24% in 2024 to 80% in 2025. Among players with 1GW+ capacities, just 34% of models are TOPCon.
- **Capacity utilisation:** The current manufacturing capacity of 102GW is just nameplate capacity, consisting of over 7,500 models from 82 manufacturers. The actual output is just 45-55% due to frequent technology changes, fluctuating demand, wide variants of modules and small size of orders. Leading manufacturers like Emmvee/ Premier/ Vikram/ Waaree reported effective capacity utilisation of 39%/60%/48%/43% during FY24.
- **Key is integration:** India has already laid out plans for gradually mandating integration of cell, wafers and ingots, beginning Sep'25, with cells, requiring a multifold increase in capital and capability. A manufacturer is investing INR 25bn in setting up an integrated 3GW solar cell/module manufacturing facility. Across the value chain, cell manufacturing is the most complex stage. Surface texturing, anti-reflective coatings, doping and electrode printing are crucial steps affecting efficiency. Premier Energies took 2+ years to increase its utilisation of monoPERC cell facility from 36% in FY22 to 90% in Jun'24. Existing players not only need to expand their module manufacturing capacity but also need to accelerate backward integration in order to remain relevant and competitive.
- **Analogy to wind:** Similar to ALMM, RLMM is the list of wind turbine models consisting of 33 models from 14 companies with total 18GW manufacturing capacity. However, total supply of turbines suited for developers' requirement (>3 MW) doesn't exceed 6GW due to obsolete technology in the rest of the cases.

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JM Financial Research is also available on: Bloomberg - JMFR <GO>, FactSet, LSEG and S&P Capital IQ.

Please see Appendix I at the end of this report for Important Disclosures and Disclaimers and Research Analyst Certification.

100 GW+ of solar modules capacity? Not Really

In Aug'25, India crossed 100GW mark of solar PV module manufacturing capacity, enlisted under the ALMM, spread across 123 manufacturing units owned by 82 companies. The depth of capacity and breadth of participation is remarkable. However, with India's annual module demand at 45–55GWp, this capacity surge has raised concerns among investors regarding the risk of underutilised assets, margin compression, and the potential to constrain backward integration—now becoming critical for survival.

A closer look into the ALMM-listed capacities reveals startling insights. Solar PV technology is evolving rapidly, and today, global leaders like LONGi, JinkoSolar, Trina Solar, and Canadian Solar are already offering TOPCon-based modules with 600Wp+ peak power output and module efficiencies near or above 23%. In contrast, a majority of the 7,500+ module models manufactured by India's 82 ALMM-enlisted companies fall short of current market expectations. Only 11% of models achieve efficiencies above 22%, and just 5–6% offer 600Wp+ power output. Moreover, 37 of these manufacturers have entered the market in just the last year, highlighting their limited experience.

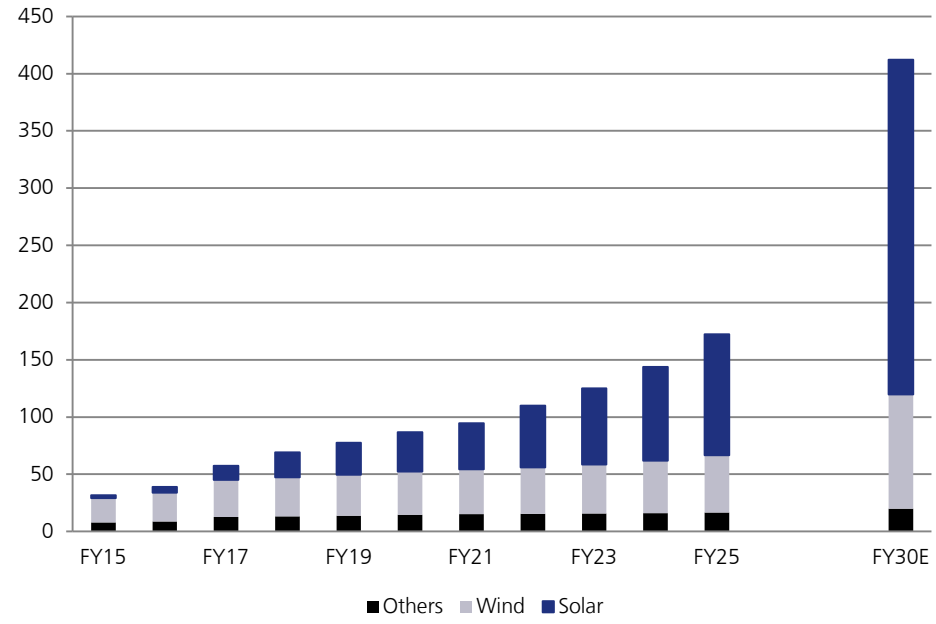
The simpler phase of solar value chain module assembly is now behind us. The industry is entering a more capital- and capability-intensive phase, driven by the need for backward integration into cells, wafers, and ingots, supported by policy mandates. This shift comes at a time when even the leading manufacturers are operating at only 45–55% capacity utilisation. While numerous integrated (cell+module) facilities have been announced, we believe many are likely to face delays or even cancellations.

In our view, the next leg of growth will favour experienced manufacturers with financial strength, execution capability, and skilled manpower, enabling them to successfully navigate this transition. Hence, we believe the market will evolve from today's commoditised landscape into a more oligopolistic structure over time. For now, despite India's 100GW+ of nameplate capacity, effective module output is limited to 40–50GWp, and a sustained oversupply scenario is unlikely in the near term.

How many GW of modules do we require?

India added 23.83GW of solar power generation capacity during FY25 vs. 15.03GW in FY24. The total installed solar capacity now stands at 123GW. For India to achieve its 500GW Non Fossil capacity (including 292GW solar) by 2030 target, 45-50GW of capacity addition is required every year. We believe that given the challenges like curtailment, revoking of waiver of ISTS charges, mandatory use of domestic cells from Jun'26 and muted power demand, India is unlikely to see more than 35GW of annual solar power capacity addition in the coming 3-4 years on a sustained basis, which translates into annual demand for 45-55GWp of modules only for domestic requirement (considering the higher DC-AC ratio, 1.3-1.5 as explained in the next section).

Exhibit 1. Installed RE capacity (GW)



Source: CEA, JM Financial

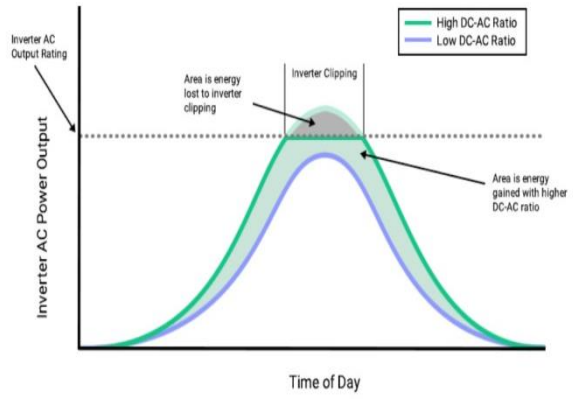
DC-AC ratio

The DC to AC Ratio – also known as the Inverter Loading Ratio (ILR) – is the ratio between the DC output power of the solar array and the AC power of the inverters. Solar panels rarely produce full-rated power all day. Oversizing DC relative to AC allows the inverter to operate near peak efficiency during most hours. The DC to AC ratio tries to optimise balance between cost and performance. While the rule of thumb is a ratio of 1.2, the declining prices of solar panels and integration of solar with storage is resulting in increasing DC to AC ratio.

As shown in Exhibit-2/3, Solar PV provides DC voltage and current following the blue line throughout the hours in the day. But with a high DC to AC ratio of 1:3 to 1:5, the AC output is clipped (loss of power when output exceeds inverter limits), and the energy from late morning to early afternoon is lost. But, if the battery is DC-coupled to the solar PV, the clipped energy in the grey region is harvested. Thus, the clipped energy harvested and the energy harvested from allowing fast ramps is stored in the battery. A higher ILR results in more energy production, which could offset the higher capital cost and result in lower levelised cost of energy.

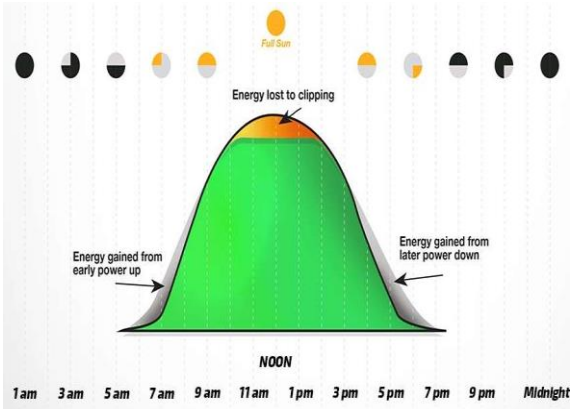
Tata Power (EPC contractor) used a DC to AC ratio of 1.55 for India's then largest utility scale solar+BESS project, SECI's 100MW(AC)/155.02MWp (DC) Solar PV power plant with 40MW/120MWh of Battery Energy Storage at Rajnandgaon, Chhattisgarh. This is significantly higher compared to Solar PV plants without BESS. This is enabled by the integration of BESS at an intermediate voltage bus, so that excess energy (in excess of 100MW) is stored in the BESS and discharged in the post-solar hours. (Vaults of Power #2: Storage plant visit - seeing is believing)

Exhibit 2. Charging of batteries with higher DC to AC ratio



Source: Power & Sun Solar Systems, JM Financial

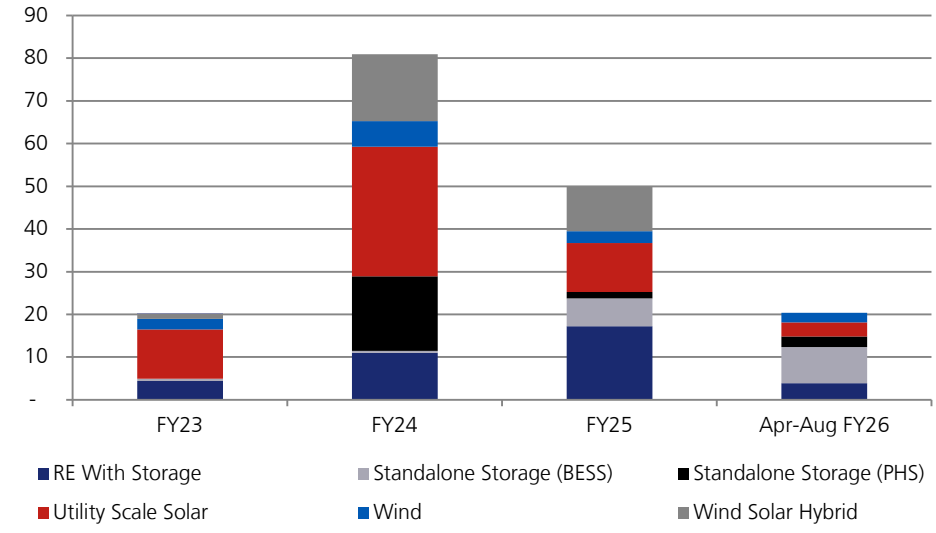
Exhibit 3. Charging of batteries with higher DC to AC ratio



Source: Power & Sun Solar Systems, JM Financial

India has shifted focus from vanilla solar/wind projects to more reliable power supply with rapid expansion of solar-plus-storage projects, driven by falling battery cost, government mandates (mandatory co-location of BESS with solar), and the demand for a more reliable, round-the-clock clean power. The country auctioned c.12.8GWh of BESS capacity between 2022 and May'25, for both hybrid and standalone applications.

Exhibit 4. Techonology-wise tenders issued (GW)



Source: JMK Research, JM Financial

What developers want

Over the years, the requirement of developers with perspective of long-term ownership has evolved with increased experience and improvement in technologies. Solar panel efficiency, peak power output (Wp), warranty and longevity and brand reputation are key consideration impacting the buying decisions. We have deep-dived into each of these criteria to understand profile of available modules in the country.

Exhibit 5. Most powerful solar panels 2025

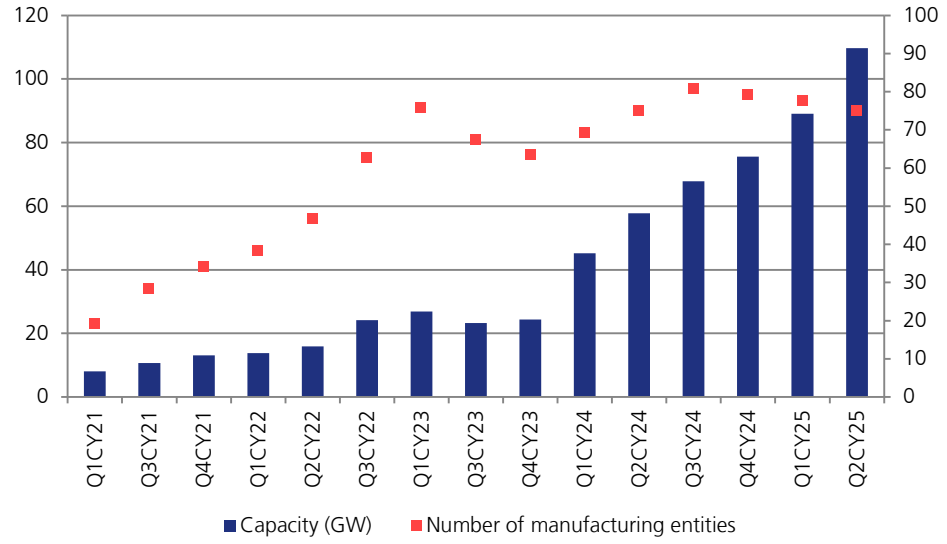
Manufacturer	Model	Power (W)	Wafer Type	Cell Technology	Efficiency %	Date Announced *
HUASUN	Himalaya G12-132	769 W	N-Type	HJT, Bifacial	24.75%	Q4 2024 *
TW SOLAR	TWMNF-66HD	765 W	N-Type	TOPCon, Bifacial	24.60%	Q3 2025 *
Trinasolar	Vertex N	760 W	N-Type	TOPCon, Bifacial	24.5%	Q3 2025 *
risen	Hyper-Ion	740 W	N-Type	HJT, Bifacial	23.89%	Q4 2022 *
Grand Sunergy	Seapower	740 W	N-Type	HJT, Bifacial	24.2%	Q1 2025 *
AKCOME	iPower 7	720 W	N-Type	HJT, Bifacial	23.2%	Q2 2023 *
CanadianSolar	TOPBiHiKu7	720 W	N-Type	TOPCon, Bifacial	23.2%	Q2 2024
RECOM	Lynx Series	720 W	N-Type	TOPCon, Bifacial	23.2%	Q2 2024
中来股份 JOLYWOOD	JW-HD132N	700 W	N-Type	TOPCon, Bifacial	22.5%	Q4 2022
SUNTECH	Ultra X Plus	700 W	N-Type	TOPCon, Bifacial	22.5%	Q3 2023
AIKO	Steller Series	690 W	N-Type	ABC, Back-Contact	24.6%	Q1 2025 *
LONGi Solar	Hi-Mo 9	670W	N-Type	Back-contact, HPBC	24.8%	Q2 2025
JinKO Solar	Tiger NEO III	670 W	N-Type	TOPCon, Bifacial	24.8%	Q2 2025
ASTRONERGY	Astro n&	670 W	N-Type	TOPCon, Bifacial	23.2%	Q2 2024
JA SOLAR	DeepBlue 4.0 Pro	645 W	N-Type	TOPcon, Bifacial	23.1%	Q2 2024
YINGLI SOLAR	Panda 3.0 Pro 1	625 W	N-Type	TOPCon, Bifacial	22.3%	Q1 2024
DASOLAR	BIPRO	630 W	N-Type	TOPCon	22.5%	Q1 2023
SERAPHIM	S5 Bifacial	620 W	P-Type	Mono PERC, Bifacial	21.6%	Q1 2022

Source: Clean Energy Reviews, Industry, JM Financial

Fragmented market

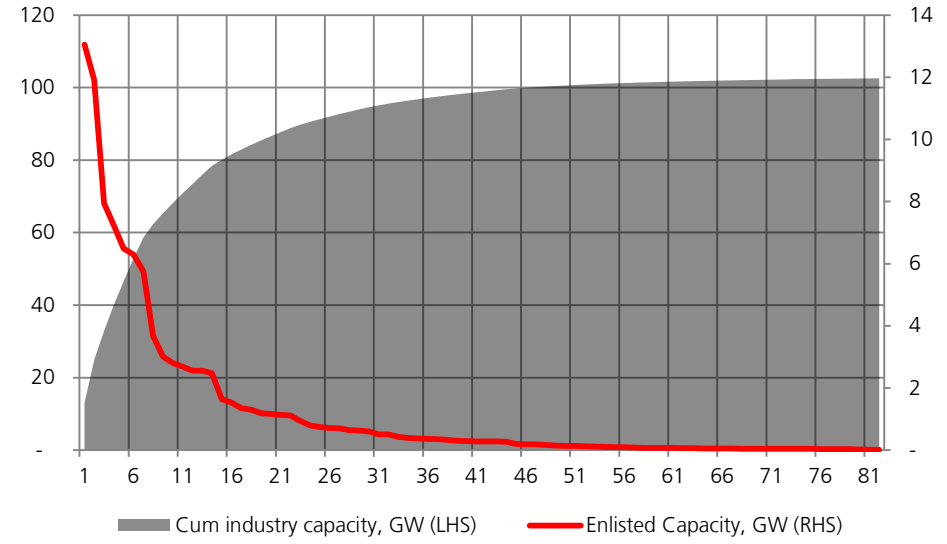
We analysed 102GW of ALMM-enlisted module manufacturing capacity spread across 82 players. Of these, 22 players have capacities above 1GW, accounting for 88GW (87% share). The remaining 60 smaller players have capacities below 1GW each, which together contributes only 14GW (13% Share). As per the ALMM list published in Aug'24, there were 77 players, of which 32 have since been removed and 37 new players added, taking the total to 82 as of Aug'25. These 37 players will have limited experience and brand reputation.

Exhibit 6. ALMM enlistment trend



Source: JMK Research, JM Financial

Exhibit 7. Cum. Capacity & no of manufacturers (GW)



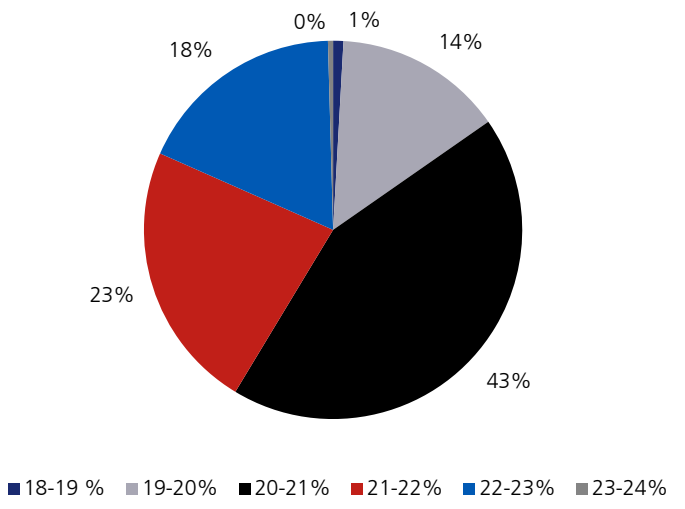
Source: Industry, JM Financial

Solar module efficiency

Efficiency refers to the percentage of sunlight converted into electricity. Higher efficiency means more power output in the same space. Today's n-type modules with TOPCon, SHJ, or interdigitated back contact (IBC) technologies show module efficiencies of 23.2%, 23.6% and 23.8% respectively. Also, p-type mono-Si based PERC modules reach efficiencies of up to 21.7%. SECI, in a recent tender, had minimum module efficiency requirement of 20.9%.

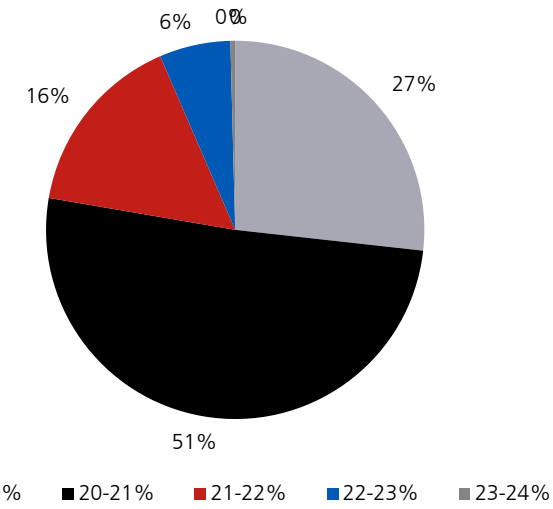
On efficiency, large players in India offer a higher share of efficiencies with 43% of models having 20–21% efficiency, 23% within 21–22% and 14% with 23–24%. In contrast, 27% (15% for large players) of small-player models still have <20% efficiency. Overall, just 11% of the modules models manufactured in India have efficiency of more than 22%.

Exhibit 8. Efficiency of models for players with > 1GW capacity



Source: MNRE, Industry, JM Financial

Exhibit 9. Efficiency of models for players with <1GW capacity

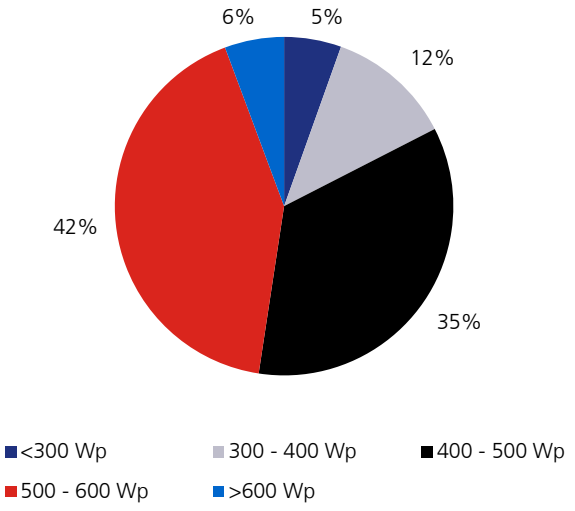


Source: MNRE, Industry, JM Financial

Peak power output (watt peak)

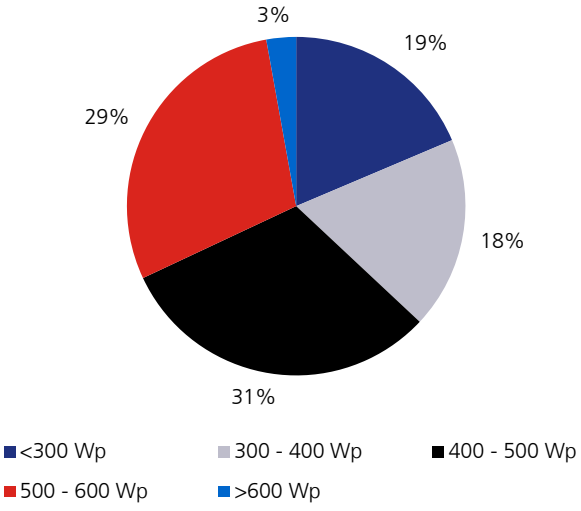
Wattage refers to the peak power a solar panel can produce under standard test conditions (1,000 W/m² irradiance, 25°C cell temperature, AM 1.5 spectrum). A higher wattage solar panel results in a lower cost of generation because it requires fewer panels, less space, mounting hardware, and wiring, thus lowering overall project and labour costs. The expectations of the developers are consistency increasing due to land/RoW-related challenges and, hence, utility-scale solar projects are now commonly requiring a minimum capacity of 550Wp. For example, recent (Jul'25) tenders from NTPC Renewables require crystalline solar PV bifacial modules with minimum 570Wp nominal rating vs. 540 Wp in Dec'23. Among ALMM-enlisted models, just 48% models of large players (>1GW) are more than 500 Wp vs. 32% for small players (<1GW).

Exhibit 10. Wattage of models for players with >1GW capacity



Source: MNRE, Industry, JM Financial

Exhibit 11. Wattage of models for players with < 1GW capacity

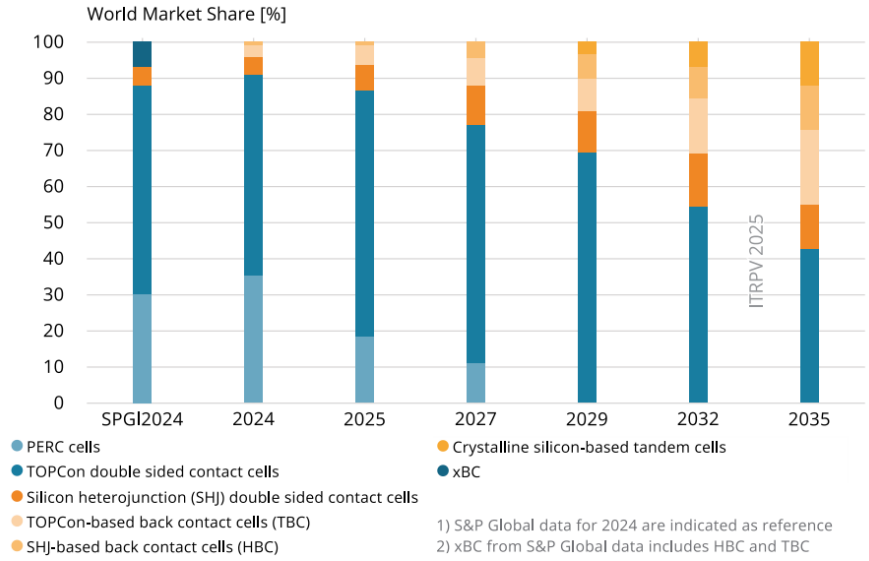


Source: MNRE, Industry, JM Financial

PV technology

Solar PV technology is in continuous flux, moving away from passivated emitter and rear contact (PERC) technology to tunnel oxide passivated contact (TOPCon) technology. The advantages of TOPCon are clear: higher efficiency (23-25%), 1-2% advantage in energy yield, and significantly lower LCOE. Jinko Solar has developed N-type TOPCon modules with a maximum conversion efficiency of 25.58%. The most dominant technology in 2024 was the TOPCon double sided contact cell. The phase out of the PERC cells has started, with PERC cells having just 24% market share in 2024. Various global studies unanimously agree that TOPCon will dominate the cell technology landscape in the near to medium term. China Photovoltaic Industry Association (CPIA) forecasts TOPCon to capture around 80% of the market share in 2025.

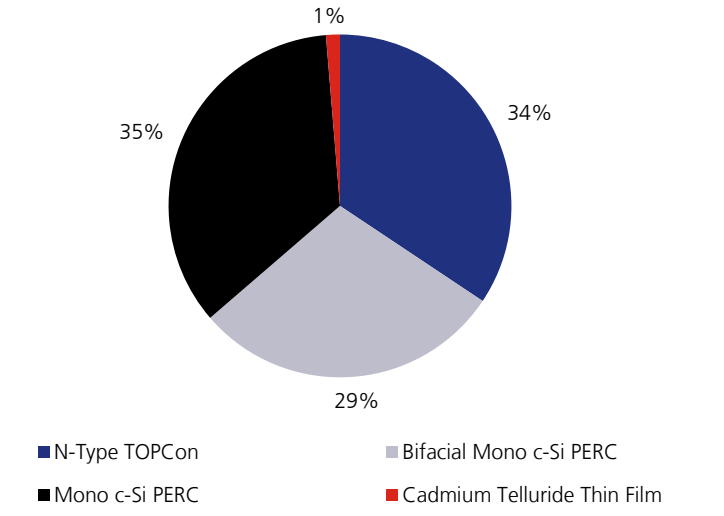
Exhibit 12. Trajectory of different cell technologies



Source: ITRPV 2025, JM Financial

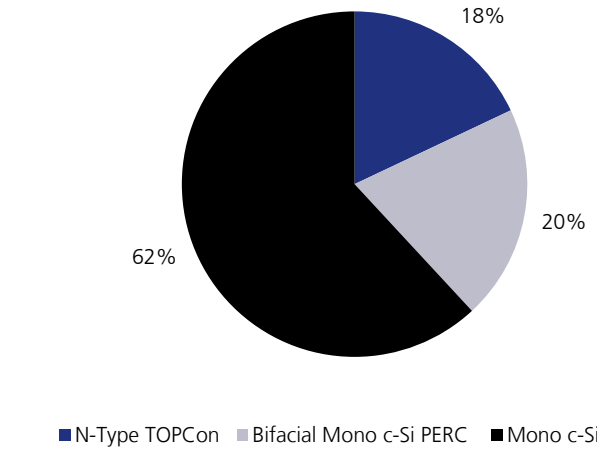
In India, among players with capacities above 1GW, 34% of their enlisted capacity is based on the TOPCon technology, while bifacial mono-PERC and mono-PERC account for 29% and 35%. Smaller players with capacities below 1GW continue to depend upon older technologies, with 62% of their models still mono-PERC and with only 18% of TOPCon models.

Exhibit 13. Technology of models for players with >1GW capacity



Source: MNRE, Industry, JM Financial

Exhibit 14. Technology of models for players with <1 GW capacity



Source: MNRE, Industry, JM Financial

Capacity utilisation

The current manufacturing capacity of 102GW is just nameplate capacity, consisting of more than 7,500 models from 82 manufacturers. The actual production output at any given time is significantly lower as most of manufacturing facilities operate at an utilisation of 45-55% due to frequent changes in technology, fluctuating demand for products leading to complicate production scheduling, wide variants of modules requiring frequent adjustments in manufacturing processes and small size of orders. A handful of large established players are able to attain 65-75% utilisation on certain occasions only. Premier Energies reported utilisation of 74%/60%/43% for modules and 88%/81%/41% for cell during FY25/FY24/FY23. Similarly, Waaree Energies reported module capacity utilisation of 43%/40%/46%/53% (on effective capacity) and 40%/29%/24%/41% (on nameplate capacity) during FY24/FY23/FY22/FY21.

Exhibit 15. Capacity utilisation of leading module manufacturers

Company	FY21	FY22	FY23	FY24	FY25
Emmvee Solar					
Annual installed capacity (a), GW	-	-	1.6	1.6	6.0
Effective installed capacity (b), GW	-	-	1.0	1.2	2.7
Actual production (c), GW	-	-	0.2	0.5	1.5
Capacity utilization wrt Annual installed capacity (c/a)	-	-	14%	30%	25%
Capacity utilization wrt effective installed capacity (c/b)*	-	-	22%	39%	54%
Premier Energies					
Annual installed capacity (a), GW	0.5	1.2	1.4	3.4	5.1
Effective installed capacity (b), GW	0.4	0.9	1.1	1.7	-
Actual production (c), GW	0.2	0.2	0.5	1.0	-
Capacity utilization wrt Annual installed capacity (c/a)	40%	19%	36%	30%	-
Capacity utilization wrt effective installed capacity (c/b)*	46%	26%	43%	60%	74%
Vikram Solar					
Annual installed capacity (a), GW	-	2.0	3.5	3.5	4.5
Effective installed capacity (b), GW	-	1.4	1.1	1.8	1.6
Actual production (c), GW	-	0.5	0.4	0.9	1.3
Capacity utilization wrt Annual installed capacity (c/a)	-	26%	12%	24%	29%
Capacity utilization wrt effective installed capacity (c/b)*	-	37%	40%	48%	78%
Waaree Energies					
Annual installed capacity (a), GW	2.0	4.0	9.0	12.0	15.0
Effective installed capacity (b), GW	1.5	2.1	6.5	11.0	-
Actual production (c), GW	0.8	1.0	2.6	4.8	-
Capacity utilization wrt Annual installed capacity (c/a)	41%	24%	29%	40%	-
Capacity utilization wrt effective installed capacity (c/b)*	53%	46%	40%	43%	-

Source: Company, DRHP, JM Financial; * Effective installed capacity is calculated on the basis of the duration during which the manufacturing facility was under operations; wrt: with respect to.

Key is integration

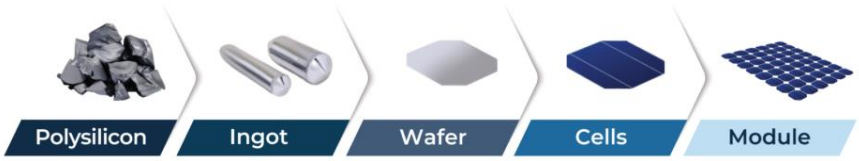
The manufacture of modules is the simplest part of the solar PV value chain, which so far has been exploited by numerous manufacturers in India. Now, the sector is developing backwards requiring higher degree of capabilities both technology as well as people and capital-intensive manufacturing. In Aug'25, the government issued the first ALMM List-II for solar cells, enlisting nine domestic manufacturers with a cum. annual production capacity of 13.067GW; that has now increased to 17.88GW. Starting Sep'25, all tenders require developers and EPC players to use solar modules compliant with the ALMM List -II for solar cells. Now, the government has also proposed mandating the use of India-made wafers and ingots under the ALMM starting 1st Jun'28, to accelerate domestic manufacturing capacities across the solar value chain. Existing players not only need to expand their module manufacturing capacity but also need to accelerate backward integration in order to remain relevant and competitive.

Across the solar PV value chain, cell manufacturing is the most complex and technology-intensive process and is subject to maximum technology risk. Surface texturing, anti-reflective coatings, doping and electrode printing are crucial steps affecting the efficiency of the cell. A slight deviation in doping, which involves introducing impurities into the silicon wafer, can alter its electrical properties. Proper design and printing of the silver contacts are essential for achieving high efficiency and reliable performance in the finished solar cell. Premier Energies took more than 2 years to increase its capacity utilisation of new 2GW monoPERC solar cell manufacturing facility from 35.77% in FY22 to 89.81% in Jun'24.

For example, manufacturer 'A' is investing INR 25bn in setting up an integrated 3GW solar cell and module manufacturing facility. Similarly, 'B' is incurring a capex of INR 6bn-7bn for expanding module manufacturing capacity from 3GW to 6GW. To set up a 3.5GW greenfield TOPCon solar cell manufacturing facility, 'C' is investing INR 16bn-17bn. Establishing an integrated 6GW ingot wafer, cell and module manufacturing facility requires a capex of around INR 90bn-100bn. We believe only players with good capabilities and capital are likely to survive, unlike the current fragmented market with numerous smaller participants. Some of the leading players in India have already taken steps to further integrate backward by setting up ingot and wafer facilities.

Hence, while numerous integrated solar cell and module facilities have been announced, we believe that a large number of them will face delays or be shelved. The challenges of growing capital intensity, higher technology risks, and supply chain dependencies are more formidable than estimated.

Exhibit 16. Solar module value chain



Source: SEIA, JM Financial

Analogy to Wind

Similar to ALMM, the Revised List of Models & Manufacturers (RLMM) is the list of type and quality certified wind turbine models eligible for installation in the country. As per the updated RLMM list, there are 14 companies engaged in manufacturing of WTGs with 33 models and unit size ranging from 225kW to 5.2MW. The consolidated annual production capacity of these domestic wind turbines is about 18,000MW. As per our interactions with various industry players, there are effectively nine manufacturers with a portfolio of WTG ratings (> 3MW) suited for current developers' requirements. Currently, the total supply of such turbines (>3MW) doesn't exceed 6GW in the Indian market against the declared manufacturing capacity of 18GW.

Exhibit 17. Capabilities & capacities of key WTG players as of Feb'25

Country	OEMs	Nacelle Manufacturing Capacity (MW)	Blade Manufacturing Capacity (MW)	Turbine Size	Turbine Technology	O&M Installed Fleet (GW)	O&M (Turbines)	Export Capability	E&C	Self O&M
Europe	SENVION #	1000	1000	2.7 to 3.1	In House	0.90+	366	✓	✓	✓
	SIEMENS Gamesa	4000#	750	2.0 to 3.6	In House	6.7	5000	×	×	✓
	Vestas*	750	NA	2.0 to 3.6	In House	4.4	4200	✓	×	✓
	Nordex*	1600	NA	3	In House	0.4	200	✓	×	×
USA	General Electric	750	NA	2.7	In House	3	1300	✓	×	×
China	Envision	3000	400	3.3	In House	0.6	165	✓	×	×
India	Suzlon	3150**	2550	2.1 to 3.1	In House	15 (own) + 3 (Renom)	9500	✓	✓	✓
	Inox Wind	2000	2500	2.0 to 3.0	License (AMSC)	3.5	1500	×	✓	✓

Source: Industry, Media, JM Financial; Excluding Adani green's captive manufacturing capacity; * focus on exports, # plans to sell facilities, **SEL has a ramp up/ramp down capacity. Capacity of 3,150 MW is for 2.1 MW WTGs. With 3+ MW WTGs, capacity can be ramped up to 4,500 MW; # Senvion SA filed for insolvency in German courts in early April 2019. A Saudi Arabian company, Alfanar, acquired the Indian division of Senvion in 2021.

Exhibit 18. Comparative analysis of top players

Parameter	Waaree Energies	Vikram Solar	Rayzon Solar	Premier Energies	Saatvik Solar	Emmvee Photovoltaic	Goldi Solar	Websol Energy	ReNew Photovoltaics	Tata Power	Mundra Solar	First Solar	Sukhbir Agro
Number of factories	4 in Gujarat	1 each in West Bengal and Tamil Nadu	2 in Gujarat	2 in Telangana	3 in Haryana	2 in Karnataka	3 in Gujarat	1 in West Bengal	1 each in Rajasthan and Gujarat	1 each in Tamil Nadu and Karnataka	1 in Gujarat	1 in Tamil Nadu	1 in Rajasthan and Punjab
Experience in PV module manufacturing	16 years	17 years	8 years	26 years	10 years	18 years	14 years	35 years	5 years	34 years	~5 years	~2 years*	~2 years
Operational capacity	15 GW Modules 5.4 GW Cells	4.5 GW modules	6 GW modules	5.1 GW Modules, 2 GW Cells	3.8 GW Modules	7.8 GW Modules 2.9 GW cells	10.7 GW Modules	0.6 GW Modules 0.6 GW Cells	6.4 GW Module 2.5 GW Cell	5 GW Module and 4.8GW Cell	4GW module, 4 GW Cell, 2GW Ingot and 2GW wafer	3.3GW module	3.5GW Module
Under-construction capacity	11GW module, 10GW cell and 10 GW Ingot-Wafer	13 GW Modules and 12 GW Cells	2 GW Modules and 3.5 GW Cells	11 GW module, 10GW cell and 10GW Ingot-wafer	4 GW Modules and 4.8 GW Cells	8.5 GW Modules and 6 GW Cells	4 GW Modules and 4 GW Cells	0.6 GW Cells	4 GW Cell	NA	6 GW module, 6 GW Cell	NA	3.2 GW Module
Enlisted Capacity as ALMM List July-25 (MW)	11,961	2,855	3,006	3,646	1,740	6,634	8,896	242	4,608	5,222	4,162	3,433	2,558
Key Products and services	Solar PV modules, Inverters, Batteries, EPC services, rooftop solutions, O&M Services, and solar water pumps	Solar PV modules, EPC services, solar O&M services	Solar PV modules	Solar PV cells and modules, EPC services, O&M services, and water pumps	Solar PV modules, EPC services, O&M services, and solar pumps	Modules, rooftop solutions, and solar water heater solutions	Modules, EPC, Inverters, rooftop solutions, Solar water pumps, O&M IPP	Modules and cells	Module and cells	Module and cells	Module and cells	Module	Module

Source: Vikram Solar RHP, Company, Industry, JM Financial; * For India only

APPENDIX I

JM Financial Institutional Securities Limited

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Rating	Meaning
BUY	Expected return >= 15% over the next twelve months.
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REDUCE	Expected return >= -10% and < 5% over the next twelve months.
SELL	Expected return < -10% over the next twelve months.

Previous Rating System: Definition of ratings	
Rating	Meaning
BUY	Total expected returns of more than 10% for stocks with market capitalisation in excess of INR 200 billion and REITs* and more than 15% for all other stocks, over the next twelve months. Total expected return includes dividend yields.
HOLD	Price expected to move in the range of 10% downside to 10% upside from the current market price for stocks with market capitalisation in excess of INR 200 billion and REITs* and in the range of 10% downside to 15% upside from the current market price for all other stocks, over the next twelve months.
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