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Hits & Misses 2025

India's Solar Sector

- ✓ Record Solar Installations
- ✓ Increased Manufacturing
- ✓ New Firms Enter BESS
- ✓ Issue of Solar IPOs
- ✓ Maiden ALMM (Cells)

- ✗ Weak Stock Prices
- ✗ Cell Shortages
- ✗ Grid Constraints
- ✗ Exports Block
- ✗ Legal Troubles

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Hon'ble **Ms. Bogolo Joy Kenewendo**, Minister of Minerals and Energy, Botswana, inaugurates Asia's Largest Galvanizing Kettle at the Matar Factory.

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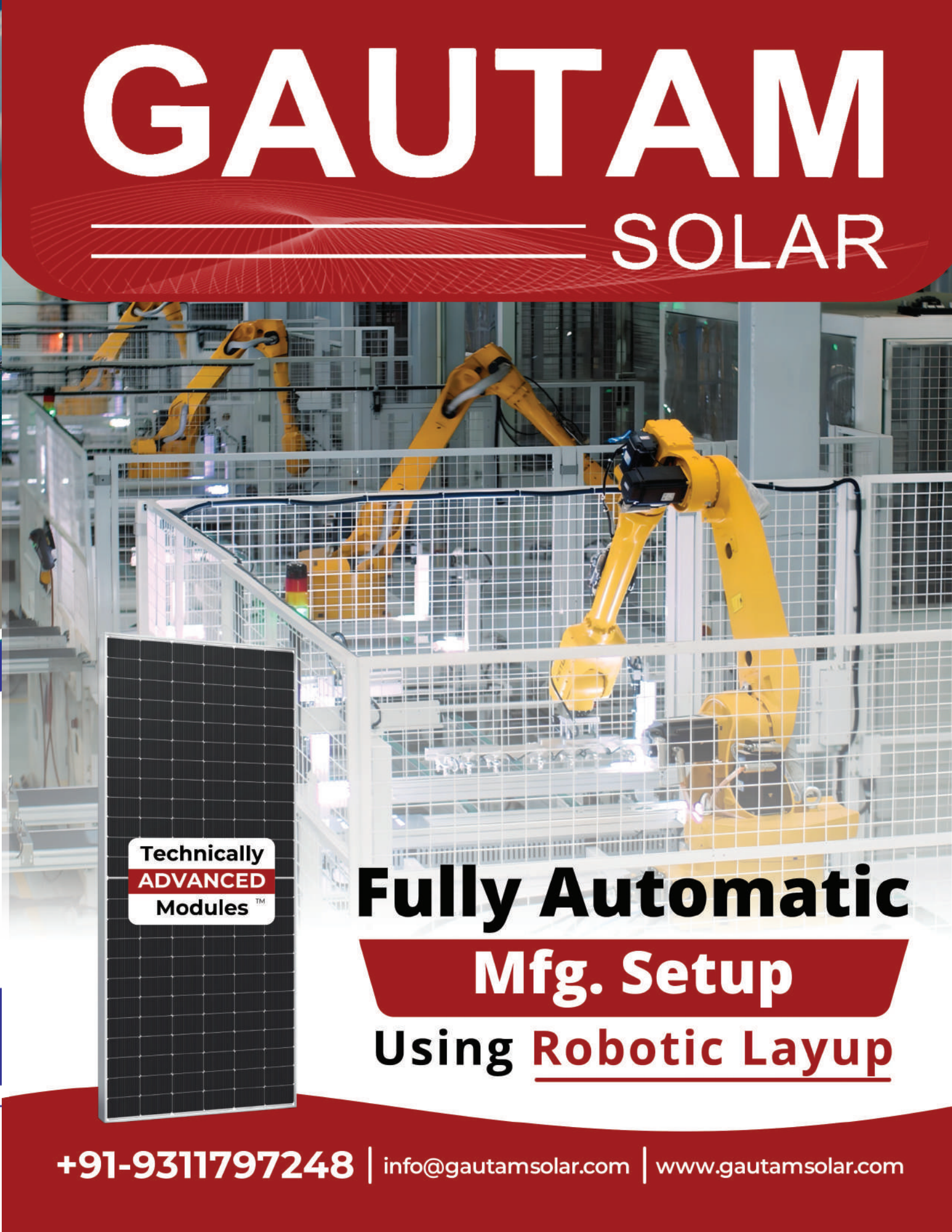

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From the Group Editor

SAUR ENERGY

At the outset, a very happy new year to you. It has been an eventful year for the sector, with more good news than bad, and I do hope you have found yourself on the right side of the story, so far. And certainly hope that 2026 will see you reap the rewards of the long, patient trip that the solar sector has made in India thus far.

There is little doubt that while 2025 was momentous, thanks to the record capacity additions, the future promises to be even more exciting for the sector in India. Growth momentum sustains, the industry is more confident than ever of its ability to deliver, and with renewed focus, expect a breakthrough or two in technology innovation to help the journey to self sufficiency.

While our cover feature sticks to the template and shares the hits and misses for anyone who needs reminding, we are particularly excited by the many changes that 2026 will bring. With the benefit of experience now, schemes like PM KUSUM and PM Suryaghar will hopefully see some much needed tweaking to make them more effective. Even as BESS-based plans continue to expand in scope and ambitions, with talk of 24 hours of renewable energy in some cases no longer outlandish.

India faces bigger issues like the long term trajectory of its thermal plans that does not leave a string of stranded assets like happened with gas- based power plants, a few years from now. A clear policy based on logical moves like allowing extensions for pit-head plants while retiring older, distant thermal plants on their due dates would certainly help. As would a reversal of retrograde policy moves like the exemption from FGD installations. The country's pollution challenge could become a serious threat to the health and growth of its citizens, and the time to act is here like never before. We hope solar will continue to provide more answers than questions, now that it has proven itself in more ways than one.

Prasanna

PRASANNA SINGH
Group Editor

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International Briefs

SPIE and Tesla Strengthen European Partnership for Battery Energy Storage Projects

European company SPIE entered a European framework agreement with Tesla for BESS projects. The agreement, which is renewable every three years, applies to all SPIE subsidiaries across Europe with expertise in BESS installation. SPIE and Tesla are collaborating on numerous completed and ongoing projects in Belgium, the Netherlands, and France.

HiTHIUM's ∞Power8 Ushers in 8-Hr Era of Long-Duration Battery Storage

Chinese battery maker HiTHIUM unveiled the ∞Power8 6.9 MW/55.2 MWh system, the world's first 8-hour-native battery energy storage solution. Built on a long-duration energy storage (LDES) system, the innovation integrates a specialised 8-hour battery cell designed natively from cell to system. The ∞Power8 marks a major step forward in enabling continuous, all-weather renewable power supply.

Saudi Arabia Connects World's Largest 7.8 GWh Energy Storage System to Grid

The Kingdom of Saudi Arabia has officially completed the grid connection of its ESS project with a nameplate capacity of 7.8 GWh. Once fully energised, it will become one of the world's largest operational BESS. The

large-scale project spans three key sites in Saudi Arabia's southwestern regions—Najran, Khamis Mushait, and Madaya. Sungrow, the equipment provider for the project has completed manufacturing of more than 1,500 PowerTitan 2.0 systems within just 58 days.

US Energy Storage Installations Rise in Q3 2025, Outlook Mixed Amid Policy Uncertainty

The U.S. energy storage market continued to expand in the third quarter of 2025, with 5.3 GW capacity installed nationwide, lifting year-to-date additions above total installations recorded in all of 2024, according to the latest U.S. Energy Storage Monitor report released by the American Clean Power Association (ACP) and Wood Mackenzie. Total installations rose 31% from a year earlier, though volumes fell 6% from the record levels seen in the second quarter. Utility-scale projects drove growth, accounting for 4.6 GW of capacity added in the quarter, up 27% year-on-year, with Texas and California together representing 82% of new installations.

GameChange Solar to Supply Trackers for ACWA Power's Khulis Solar Project

GameChange Solar said it has been selected to supply its Genius Tracker™ 1P system for the Khulis solar photovoltaic independent power plant in Saudi Arabia, being developed by ACWA Power. The project is being executed by a joint venture comprising China Energy Engineering Corp, Guangdong Power Engineering Co, and Northwest Electric Power Design Institute as EPC contractors.

EU's Shift to 15-Minute Power Pricing Boosts BESS Profits by Over 15%: Rystad

Several European countries that have begun offering BESS are expected to see more than a 15% rise in profits, according to a Rystad Energy analysis. This growth is mainly driven by the improving economics of BESS in Europe, which appear much stronger following changes to the EU power pricing structure in October. The report explained that the new EU system sets power prices every 15 minutes, rather than every hour, giving BESS operators more opportunities to buy electricity when it is cheap and sell it when prices rise.

Global Solar Additions Set for First Decline in 2026, Hints S&P Global Report

Global renewable additions will hit a turning point in 2026, with solar

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installations set to decline for the first time in more than a decade and grid bottlenecks emerging as a central constraint on clean energy growth, S&P Global Energy said in its 2026 outlook.

The agency said that by the end of 2025, the world will surpass 500 GW AC of solar power, with the surge spearheaded by China, which accounted for more than half of global additions.

Stationary Storage Leads Price Drop as Li-Ion Packs Fall 8%: BNEF Report

Lithium-ion battery pack prices have dropped 8% since 2024 to a record low of $108 per kilowatt-hour, according to the latest analysis by BloombergNEF (BNEF). The report attributes this drop to continued cell manufacturing overcapacity, intense competition, and the ongoing shift to lower-cost LFP batteries. According to BNEF's 2025 Lithium-Ion Battery Price Survey, these factors drove down pack prices despite an increase in battery metal costs.

The report identified rising risks from new cobalt export quotas in the Democratic Republic of Congo, as well as supply risks from certain Chinese lithium assets. These factors could have led to higher metal prices in 2025, but did not translate into higher annual prices for cells or packs.

US Adds 11.7 GW of New Solar Capacity in Q3, Third-Largest Quarter on Record

The U.S. solar industry installed 11.7 GW of new capacity in Q3 2025, marking its third-largest quarter on record and pushing total installations for the year past 30 GW. Despite federal actions targeting clean energy, solar and storage accounted for 85% of all new power added to the grid in the first nine months of the Trump administration. According to the U.S. Solar Market Insight Q4 2025 report released by the SEIA and Wood Mackenzie, 73% of all solar capacity installed this year has come from states won by President Trump.

Waaree Solar Americas Gets 288 MWp Order from Sabanci Renewables for Texas

Waaree Energies' arm, Waaree Solar Americas, has received a 288 MW solar module supply order from Sabanci Renewables, a utility-scale renewable project developer and energy storage project owner-operator in the US to supply the modules during the financial year 2026–27.

The order is distributed across two major utility-scale projects in Texas—the Pepper Solar Project in Waco and the Lucky 7 Solar Project in Brashear. Module deliveries for both sites are expected to begin in Q3 2026, marking a significant expansion of Waaree's footprint.

Driving Germany's 4 TWh Yearly Surge in Solar Self-Use in 2024

The Fraunhofer Institute for Solar Energy Systems (ISE) has reported a sharp rise in solar self-consumption in Germany between 2012 and 2024. According to the institute, self-consumption increased moderately from 0.25 terawatt-hours (TWh) in 2012 to 3.55 TWh in 2020, reaching 5.57 TWh in 2022.

In 2023, it rose to 8.20 TWh. Remarkably, Germany added nearly 4 TWh of new self-consumption in a single year—more than the total growth recorded from 2012 to 2020. Self-consumption then rose further from 8.20 TWh in 2023 to 12.28 TWh in 2024, a YoY increase of 4.08 TWh.

Egypt Plans $15bn, 10-GW Clean Energy Complex in South Sinai

Egypt is advancing plans for one of its largest clean energy developments, with an international consortium outlining a $15 billion renewable energy complex in the South Sinai region. The proposed 10-GW hybrid solar-wind project is designed to accelerate the country's transition toward large-scale green power production and strengthen its position in the emerging green hydrogen market.

Saudi Arabia Awards 400 MW Solar Plant to TotalEnergies–Aljomaih Consortium

TotalEnergies and Aljomaih Energy & Water have won a 400 MW solar project in Saudi Arabia after being selected by the Saudi Power Procurement Company (SPPC) under the country's National Renewable Energy Program. The As Sufun plant, located in the Hail region, is expected to begin delivering power to the grid in 2027.

The electricity produced will be sold to SPPC through a 25-year power purchase agreement (PPA). The project forms part of Round 6 of the National Renewable Energy Program, which aims to cut the use of liquid fuels in power generation and raise Saudi Arabia's share of renewables and energy storage to up to 50% by 2030, depending on future demand growth. ●

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FY26: India Adds 27 GW of Solar Capacity Till November

India added 27 gigawatts (GW) of solar power capacity in the first eight months of the financial year 2025–26, according to the latest data released by the Ministry of New and Renewable Energy (MNRE). This represents a year-on-year growth of nearly 120% in solar installations up to November.

A comparison of data from the Central Electricity Authority (CEA) and MNRE shows that during the same period last year, India added only 12.35 GW of solar capacity. The sharp increase in FY26 installations points to a faster execution of previously tendered ground-mounted solar projects, along with a strong pickup in rooftop solar installations.

Fate Of Wind Projects

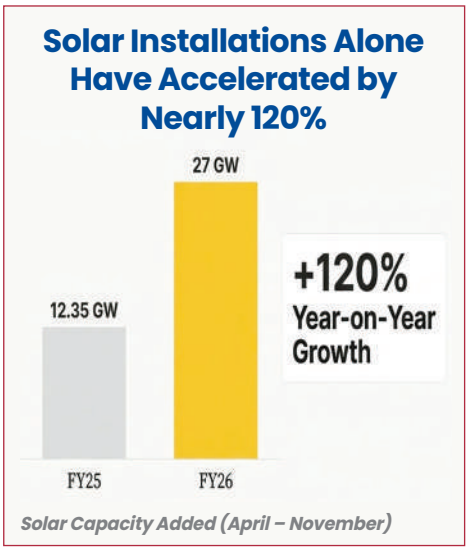
Wind power additions also gathered pace during the period. India added 3.94 GW of wind capacity till November in the current financial year, compared with around 2 GW added during the corresponding period last year.

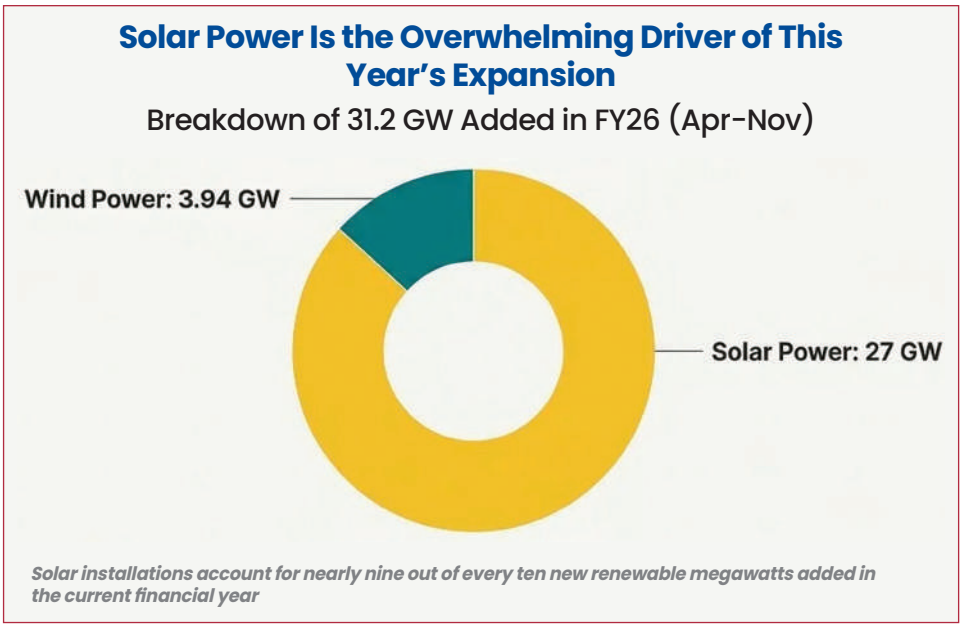
On a cumulative basis, India added 31.2 GW of renewable energy capacity, excluding large hydro, during the April–November period of FY26. This exceeds the total renewable energy capacity added during the entire financial year 2024–25.

By comparison, total renewable energy additions during the same period last financial year stood at 14.9 GW, indicating that capacity additions have more than doubled year-on-year.

Additions in November

According to MNRE data, India added 2.92 GW of solar capacity in November 2025 alone, along with 386 megawatts (MW) of wind power. Total renewable energy additions during the month stood at 3.31 GW.





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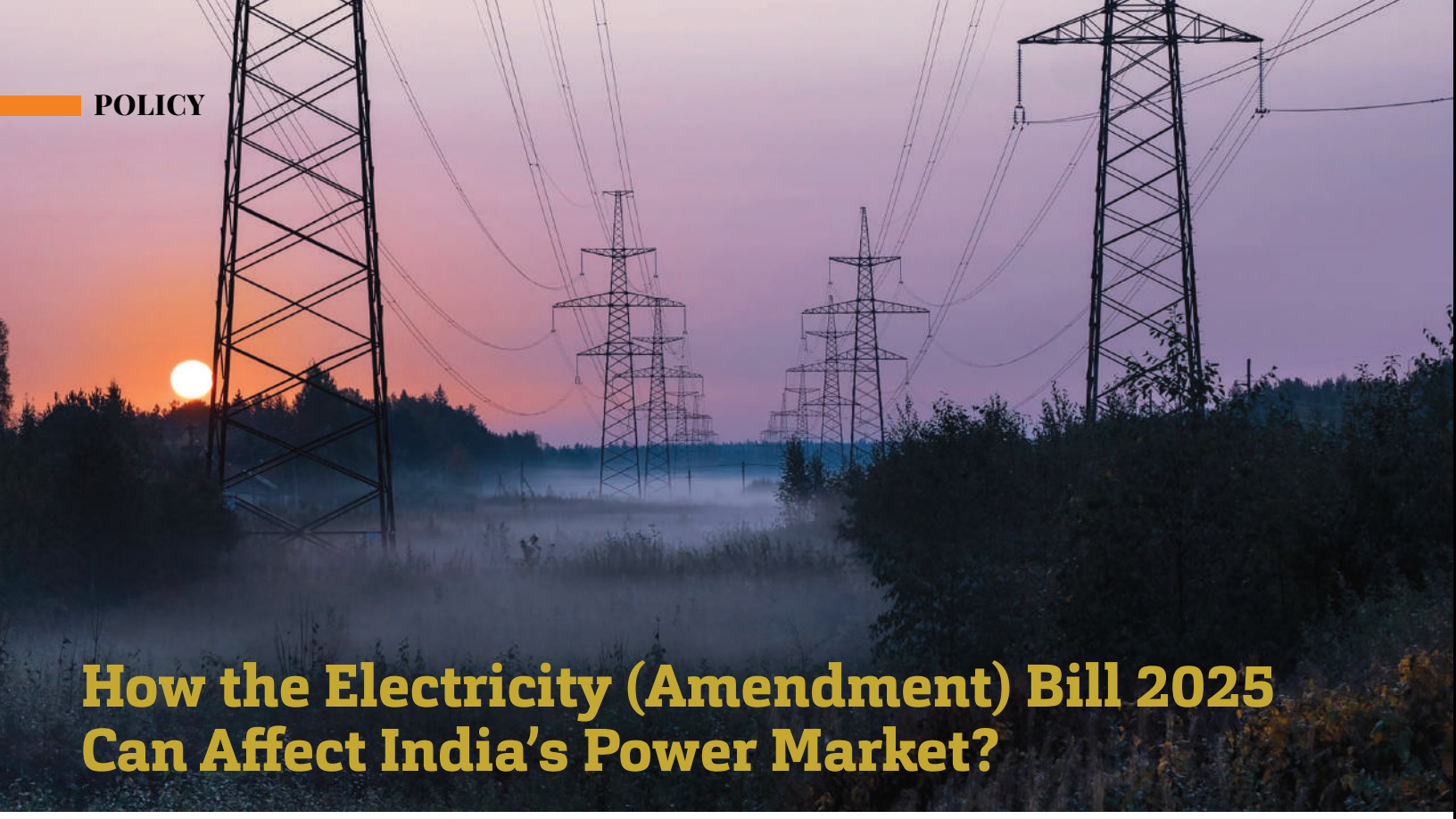

How the Electricity (Amendment) Bill 2025 Can Affect India's Power Market?

The Union government recently introduced a draft Electricity (Amendment) Bill 2025, aiming to amend one of India's most significant electricity laws—the Electricity Act of 2003. The government has highlighted several provisions that it claims could bring systemic changes to the country's power market.

As per the draft, the proposed legislation seeks to rationalise electricity costs by reducing the burden on industries and lowering cross-subsidies. It also aims to introduce multiple regulatory changes to improve the financial health of discoms.

In this report, we highlight some of the key changes proposed in the legislation and how they may affect India's electricity market, along with expert views on their likely implications.

1 Recognising Energy Storage Systems (BESS)

As per the proposed amendment, ESS has been defined as: Energy Storage System (ESS) means a system to store electrical energy in any form for a period of time and delivering it as electrical energy when required."

2 Eliminating Cross-Subsidies—Easing Industrial Tariffs

Another major reform proposed is the easing of high commercial tariffs for industries, which currently pay more due to cross-subsidies. The government now plans to phase these out. To do this, the draft bill proposes exempting the Universal Service Obligation (USO) for consumers above 1 MW who are eligible for open access. It notes that State Electricity Regulatory Commissions (SERCs) may designate a distribution licensee to supply power at a premium over the cost of supply if other arrangements fail.

The bill's explanatory note states: "This reform will unlock substantial electricity demand from industries that can access affordable power directly. By reducing tariff distortions and supporting industrial expansion, it will drive job creation and accelerate India's progress toward energy-led economic growth."

The government has proposed that tariffs should reflect the cost of supply and that cross-subsidies be progressively reduced. It has also eliminated cross-subsidies for manufacturing enterprises, railways, and metro railways.

3 Monetary Fines for Not Consuming Renewables

The draft bill introduces penalties for obligated entities that fail to consume the mandated minimum share of renewable energy. It proposes fines of not less than 35 paise per kWh and not more than 45 paise per kWh for non-compliance. The explanatory note points out that current RPO rules do not specify penalties, making this a key new provision.

4 Multiple Discoms in a Single Area

The bill proposes allowing the co-existence of multiple distribution companies in the same geographical area using shared infrastructure—an important shift from earlier practice. The government claims this could facilitate open access, reduce

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redundancy, improve service quality and lower infrastructure costs.

5 Powers to Central Bodies to Remove SERC Officials

Under Section 90(2), the Union government has been empowered to remove officials and members of SERCs in cases of wilful violations or gross negligence. Some stakeholders view this as an infringement on the autonomy of state institutions.

6 Fixed Timelines for Electricity Commissions

The draft bill introduces a provision requiring commissions to decide cases within 120 days. Currently, no statutory timeline exists for adjudicating proceedings. The government notes that, with rising renewable penetration and increased caseloads, such a step is necessary. It also proposes limiting APTEL to no more than seven members besides the Chairperson.

7 Eligibility Criteria for Captive Generating Plants

The draft amends provisions to empower the appropriate commission to prescribe eligibility criteria for captive generating plants and their users. At present, norms require captive users to hold at least 26% ownership and consume a minimum of 51% of the power generated annually.

8 Establishment of Electricity Council

The draft proposes creating a new Electricity Council headed by the Union Power Minister and Power Secretary. Its role will be advisory, involving consultations on key policies and supporting reforms to streamline the sector.

9 Definition of Manufacturing Enterprises

The bill defines manufacturing enterprises—exempt from cross-subsidies—as:

'Manufacturing Enterprise' means an industrial undertaking or a business concern or any other establishment, by whatever name called, engaged in the manufacture or production of goods, in any manner, pertaining to any industry specified in the First Schedule to the Industries (Development and Regulation) Act, 1951."

10 Power for Suo Motu Tariff Adoption

The draft states that if tariff adoption applications under Section 67 are not submitted to the commission in time, the commission may determine tariffs suo motu. The explanatory note says: "Non-determination of tariffs before the beginning of the financial year has been resulting in mounting distribution sector losses. Currently, the Act does not explicitly authorize the Appropriate Commissions to determine tariffs on a suo moto basis before the financial year begins."

REACTIONS

Shashwat Kumar, Partner at CMS INDUSLAW, noted that while the amendments aim at reforms, some may be more complex than they appear. He said: "While some key amendments like allowing open access to distribution licensees to the distribution network of another licensee, completely amending the provisions relating to the power of placing and maintaining electric lines (Section 164), increasing the strength of the Appellate Tribunal for Electricity and eliminating cross-subsidy in certain sectors are major steps in the right direction, the proposed amendments relating to captive generation, limiting universal service obligation of the distribution licensee and suo motu distribution tariff determination may require a deeper review and discussion."

Shivam Sinha, Partner at Sagus Legal, said that while eliminating cross-subsidies may help industries, the approach may present challenges: "At present, the justification provided for the elimination of CSS is that the State Governments can fund the subsidies in terms of Section 65 of the Act, however in the absence of any specific mandate for the same, its removal could invite resistance unless alternative subsidy mechanisms are put in place. Similarly, under the proposed Section 43(4), distribution licensees can seek exemption from their universal supply obligation for consumers above 1 MW. This poses risk of creating a scenario where economically weaker consumers may be saddled with increased tariff burden due to dearth of cross-subsidising entities."

Energy think tanks have also expressed concerns. The Centre for Energy, Environment and People (CEEP) responded to several provisions, highlighting potential risks: "These amendments seem to be addressing three key challenges of contemporary energy governance, energy security, energy affordability, and energy sustainability. However, the Bill is clearly more tilted towards reducing industrial tariffs, abolishing crosssubsidies, and has remained silent over phasing-out of existing or reducing investment in fossil-fuel based thermal power plants. Hence, the Bill completely ignores energy equity and affordability completely, and sustainability partially in favour of energy security,"CEEP said in its full report.

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RERC Finalizes Green Energy Open Access Rules With Amendments

The Rajasthan Electricity Regulatory Commission (RERC) has finalised the procedure for granting Green Energy Open Access after conducting public consultations with concerned stakeholders. The state power regulator notified the Green Energy Open Access regulations on May 21, 2025.

Earlier, RERC had directed the state nodal agency—Rajasthan Rajya Vidyut Prasaran Nigam Ltd (RVPNL), the State Transmission Utility (STU)—to issue a detailed procedure. The STU subsequently published the draft procedure on August 28, 2025. After reviewing the draft and hearing stakeholders' views, RERC has now finalised the procedure for Green Energy Open Access.

Following are some of the key changes made by the state commission after public consultations:

1. Removing GNA Applicability Bottlenecks

The state commission addressed issues related to applicants registered under the General Network Access (GNA) regime for the inter-state transmission network. The commission noted that GNA and T-GNA are applicable at the inter-state level, and short-term, medium-term, and long-term open access applications could involve both.

RERC has proposed adding a new provision to Clause 1.4 of the draft procedure. It stated, "Provided that for transactions involving inter-State Transmission (State Network incidental to the inter-State Transmission), the Procedure shall also be applicable to the Registration and applications made for the grant of Green Energy Open Access by availing General Network Access (GNA) or Temporary General Network Access (T-GNA)."

2. Interoperability From NOAR to GOAR Portal

The new procedural norms also address ease of portability from the National Open Access Registry (NOAR) to the Green Energy Open Access Registration (GOAR) portal. RERC stated that for inter-state open access consumers already registered under NOAR, the nodal agency should take steps to ensure interoperability between the NOAR, GOAR, and the state portal. Data available on NOAR/GOAR will be deemed valid for the state portal.

3. Conditional Open Access (for Grid Connectivity Issues)

The new procedures specify that the requirement of valid grid connectivity for availing Green Energy Open Access may be relaxed for new upcoming entities that do not have prior connectivity, subject to conditions. Such entities must submit a valid connectivity feasibility approval. Conditional open access may be granted, but physical connectivity must be achieved at least 30 days prior to the intended date of power flow.

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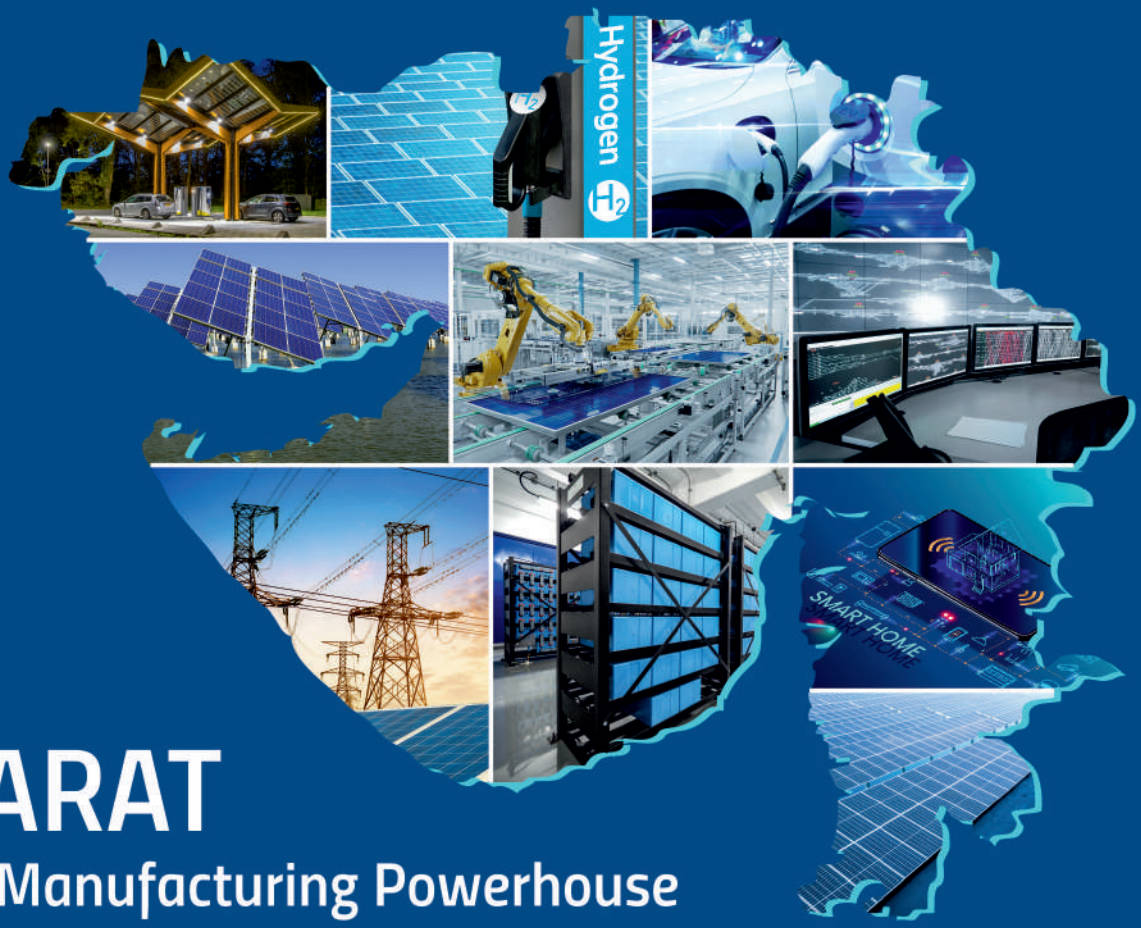

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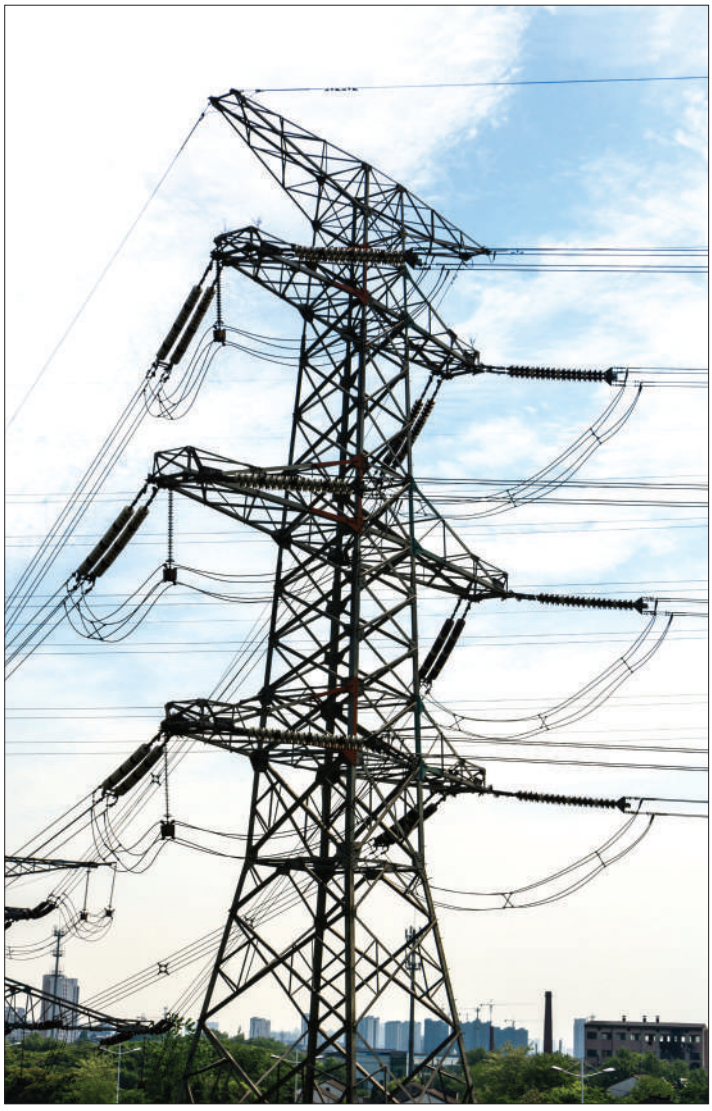
This provision was introduced after stakeholders highlighted that in certain cases—such as when entities hold pre-construction approvals like building plans, fire NOCs, or consent to establish—the requirement of prior grid connectivity before GEOA should not apply.

4. Removing Difficulties for Entities With Multiple Connections

The procedural norms also address challenges faced by smaller entities with multiple power connections, particularly the burden of paying GEOA application charges separately. RERC has added a new provision to address this issue.

It stated, "Provided the Entities with multiple connections aggregating 100 kW or more located in same electricity division of a distribution licensee shall be eligible to submit a unified Green Energy Open Access Application covering all such connections. In such cases application fee will be charged as: 1. Base Fee: Rs. 1,00,000/- (covering first injection point and drawal point) 2. Incremental Fee: Rs. 10,000/- for each additional drawal point thereafter."



5. Eligibility of Hybrid Projects

The RERC notification clarified that hybrid projects will be eligible for Green Energy Open Access. The quantum of GEOA will be based on the connectivity quantum of the hybrid project, irrespective of the capacities of individual components.

"A new proviso may be added after the first para of Clause 5.1. This will ensure that, for hybrid renewable energy projects, the Green Energy Open Access (GEOA) is determined based on the total connectivity of the hybrid project rather than the capacities of individual components. This provides clarity in eligibility and calculation, simplifies accounting, and avoids disputes regarding the allocation of geos across multiple RE sources. Hybrid setup," the report said.

6. Additional Capacity for BESS

The procedural norms state that for captive power plants with capacity above 100 percent and up to 200 percent of contract demand, the demand for BESS will be calculated based on a minimum of 20 percent of the energy generated at normative CUF/PLF, as per the RERC Renewable Energy Tariff Regulations, 2020.

7. Security Deposits

The state GEOA procedural rules now specify that for captive plants, security deposits must exclude charges for cross-subsidy surcharge and additional surcharge, provided consumers submit an undertaking regarding the status of their power plants.

8. Force Majeure Events

The rulebook clarifies that cancellation and bank guarantee encashment for failure to sign the commercial agreement will not apply if the failure is attributable to events beyond the applicant's control (force majeure events).

9. Cancellation Process and Restoration

The rules state that before cancellation, the nodal agency must issue a 15-day default notice to allow the applicant to cure the defect. If the issue is not resolved, open access will be suspended. During the suspension period, the consumer will remain liable for fixed and transmission charges but may apply for restoration by clearing all dues and paying a restoration fee of ₹25,000. ●

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Jakson To Set Up India's First Hi-Tech Solar Panel Recycling Plant

Jakson Engineers Limited, part of India's Jakson Group, has signed an agreement with a European technology provider to establish what it said would be the country's first hi-tech photovoltaic (PV) module recycling facility, as India begins to address the growing challenge of end-of-life solar waste.

The company said the plant will be capable of recycling around 300 megawatts of solar panels annually, equivalent to about 500,000 modules or 13,500 tonnes of material a year. The facility will recover materials such as aluminium, glass, silicon, copper and silver from discarded panels.

Pact Signed

Jakson Engineers signed the contract with Italian technology firm Ecoprogetti SRL, the company said in a statement on Monday.

India is among the world's fastest-growing solar markets, with installed capacity expanding rapidly over the past decade. Industry experts have warned that large volumes of solar waste will begin to emerge in the coming years as early projects reach the end of their operational life.

"This investment is aimed at ensuring that solar power becomes more resource-efficient and circular by recovering valuable materials and reducing dependence on virgin raw materials," said Gagan Deep Chanana, joint managing director and chief executive of Jakson Engineers.

Bharat Gupta, a director at Jakson Engineers, said the facility would help divert thousands of tonnes of solar waste from landfills annually and return critical materials to the manufacturing supply chain.

Expanding Solar Footprints

The recycling initiative comes as Jakson expands its presence across the solar value chain. The group recently laid the foundation stone for the first phase of a 6-gigawatt integrated solar manufacturing facility in the central Indian state of Madhya Pradesh, with a planned investment of more than 80 billion rupees ($960 million).

Jakson Group, founded in 1947, operates across power generation, renewable energy, energy storage and infrastructure engineering, with manufacturing facilities and offices in India and overseas. ●

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Waaree Energies Expands Manufacturing Capacity with Additional 1.5 GW at Samakhiali Facility

Indian solar module and cell manufactuter Waaree Energies has expanded its domestic production capacity by adding 1.5 GW of solar module manufacturing at its Samakhiali plant in Kutch, Gujarat.

The expansion follows the commissioning of two high-efficiency module lines of 750 MW each at the same site, taking total new capacity added to 1.5 GW. With this, Waaree has scaled the Samakhiali facility to an annual capacity of 3 GW. The plant is now one of the company's most advanced manufacturing hubs, equipped with next-generation automation, enhanced quality controls and integrated testing systems to meet growing domestic and overseas demand for high-performance solar modules.

New Milestone

Sunil Rathi, Executive Director, Waaree Energies Limited, said, "The expansion of our Samakhiali facility to 3 GW marks another milestone in Waaree's purposeful capacity build-out. This positions us to serve strategic markets more effectively while advancing our vision of delivering reliable, locally manufactured solar technologies at scale."

Waaree said the latest expansion strengthens its domestic and international manufacturing footprint as it broadens its portfolio beyond modules and cells to include inverters, battery storage systems, green hydrogen solutions and EPC services.

Total Global and India Manufacturing Capacity

With the Samakhiali expansion, Waaree's total solar module manufacturing capacity stands at about 22.3 GW globally, including around 19.7 GW in India and 2.6 GW in the United States. Its solar cell manufacturing capacity remains at 5.4 GW, making it one of the largest cell production platforms in India.

Founded in 1990, Waaree Energies Limited is a leading renewable energy company headquartered in Mumbai. It operates advanced manufacturing facilities with a total solar PV module capacity of about 22.3 GW and a solar cell capacity of up to 5.4 GW. With a presence across India and more than 25 countries, the company offers solar panel and inverter manufacturing, EPC services, green hydrogen solutions, battery energy storage systems, green energy infrastructure and data centres. ●

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After Push From Adani, Envision, Race for 5 MW Wind Turbines Gathers Pace in India

Chinese wind energy company Envision Energy recently announced the installation of its 5 MW wind turbines for a green energy project at Mudugal in Karnataka. The project was undertaken by CleanMax, a Mumbai-based Independent Power Producer (IPP). The firm said that it was India's first 5 MW wind turbine installed on the ground.

The development signals a technological transition in India's wind energy sector, where developers are increasingly considering higher-efficiency, large-capacity turbines. While Envision Energy has claimed this as India's first 5 MW-series installation, the wider industry is actively evaluating the feasibility of deploying advanced, large-scale wind turbines in geographically suitable regions.

The following outlines key market trends and how various wind energy companies are transitioning toward 5 MW and other higher-capacity turbines in India.

Adani Group's Tryst with 5.2 MW Turbines

Adani Group earlier secured enlistment of its 5.2 MW wind turbines under the Ministry of New and Renewable Energy's (MNRE) Approved List of Models and Manufacturers (ALMM). These turbines were later deployed at the company's renewable energy projects in Khavda. The company had previously claimed to have introduced this technology in India for the first time.

SANY's 4 MW Project Executed

Another wind turbine manufacturer, SANY, has introduced its 4 MW class wind turbines for the Indian market. These turbines have been used in

projects for JSW Group, Sembcorp, and others. Recently, SANY was selected by Serentica for a 336 MW wind project in Karnataka, which will use its 4 MW turbines.

Inox Set to Launch 4 MW Turbines

The Inox Group is preparing to launch its 4 MW wind turbines soon. In its latest investor presentation and earnings call, the company discussed plans to bring its new 4 MW machines to market in the coming months.

The firm stated: "Inox Wind is targeting the launch and order intake for its latest offering over the next few months. The globally proven 4X MW turbine is being developed under license from Wind2Energy, and designed for low wind conditions prevalent in India, further reducing the LCoE for our customers," the firm had said in its investors presentation for Q2FY26.

Suzlon Satisfied with 3.15 MW But Open to Change

Pune-based Suzlon Energy, meanwhile, stated that nearly 90 percent of its current order book comprises its 3.15 MW turbines. The company maintains that, given prevailing market demand, it will introduce higher-capacity turbines when market conditions justify the move.

As per the company's commentary: "Today, our 3.15 megawatt is a very successful product, what we have. We have already supplied about 2.3 gigawatts and then more than 5 gigawatts of the current order book is 3.15. In fact, 90% of our current order book is 3.15. And there is a significant interest in 3.15 because people look at cost per kilowatt hour than what is the capacity of the model. Having said that, our next set of models would keep coming regularly, and you will start seeing us announcing the next model shortly. And we will be there at that level. I don't want to mention the time line, but the progress is underway. Some models are under prototype and some are currently under the procurement phase," JP Chalasani, CEO of Suzlon Energy had said recenytly in its investors talk.

He also added: "In my view that we will not see that as an issue for us to face the competition. I'm not trying to dodge the question here, but I don't see that as a major issue. We are pretty confident that when the 3.15 interest exhausts, much before that, we will have our next turbine -- higher model turbine."

However, it is also a fact that these high-end turbines are not suitable for all windy regions of the country; suitability depends on local geography and wind conditions.

Latest ALMM Status

As per the latest ALMM for wind energy issued by MNRE on December 2, 2025, India is home to 13 enlisted wind turbine manufacturers. The highest-rated turbine capacities include a 5.3 MW model from Venwind Refex Power, a 5.2 MW turbine from Adani Wind, 5 MW from Envision, and a 4 MW turbine from SANY, among others. ●

Suzlon, Yanara Extend Partnership with 306 MW Wind Projects for Rajasthan FDRE Portfolio

Suzlon Group and Yanara have extended their partnership with the signing of two new wind contracts of 153 MW each for Yanara's firm and dispatchable renewable energy (FDRE) projects in Barmer, Rajasthan. In a press release, Suzlon said the latest projects have expanded its footprint in Rajasthan, where it has installed over 2.3 GW of wind capacity, translating into a 44% market share.

In addition, Suzlon is currently executing other large engineering, procurement and construction (EPC) projects in the state, totalling 791 MW. Across Yanara's two FDRE projects in Barmer, aggregating approximately 800 MWp, Suzlon will install 102 S144 wind turbine generators with hybrid lattice towers, each rated at 3 MW. The power generated will partially fulfil Yanara's power purchase agreement (PPA) obligations with multiple utilities, including NTPC and NHPC.

Building Renewable Energy Portfolio

Yanara is developing a grid-scale portfolio of hybrid renewable energy projects that combine solar, wind, and energy storage solutions to deliver round-the-clock (RTC) clean power. The two Rajasthan projects follow closely after Yanara's 115 MW co-located solar-wind hybrid project in Maharashtra, which is nearing completion and includes a 29.4 MW wind order from Suzlon.

Girish Tanti, Vice Chairman, Suzlon Group, added, "With 30+ years of trust, Suzlon leads India's wind energy sector, while Yanara develops hybrid projects across APAC, and our work together now spans Maharashtra to Rajasthan, highlighting our technology, solutions, and customer trust. Repeat orders like this demonstrate the strength of our partnership."
Jerome Ortiz, Chief Executive Officer, Yanara, said, "At Yanara, we are developing pioneering projects across Asia-Pacific to accelerate the transition away from fossil fuels. We are delighted to collaborate with them on our hybrid projects in India. Through such projects and partnerships, Yanara continues to embed innovation, reliability, and sustainability at the core of every development we undertake."

Naveen Khandelwal, Chief Executive Officer, India, Yanara, added, "Rajasthan is a strategic market for Yanara, with its rich wind and solar potential and supportive renewable energy project development policies. Our continued partnership with Suzlon for our utility-scale projects underscores our commitment to building a reliable multi-gigawatt clean energy portfolio across India.

Emmvee Arm Commissions Sixth 2.5 GW Solar Module Line in Bengaluru, Lifts Capacity to 10.3 GW

Karnataka-based Emmvee Photovoltaic Power Limited, through its subsidiary Emmvee Energy Private Limited (EEPL), has commenced operations of its 2.5 GW solar module line at Unit VI. In a regulatory filing, Emmvee said the latest unit was commissioned at its factory in Sulibele, Hoskote Taluk, Bengaluru, Karnataka, on December 20, 2025. The commissioning of the latest line takes Emmvee's aggregate solar module manufacturing capacity to 10.3 GW.

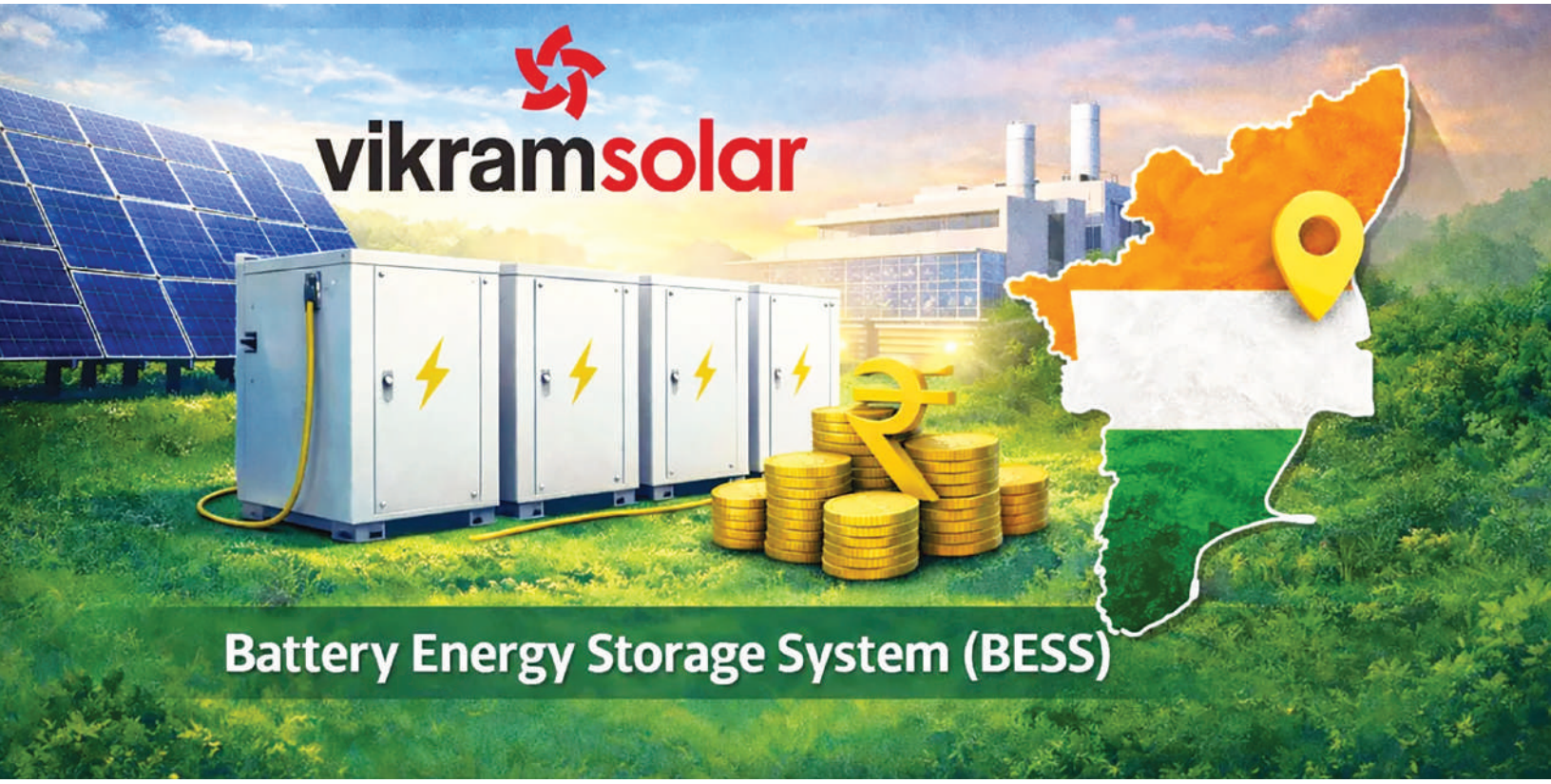
Emmvee described the commissioning as part of the company's planned capacity expansion, as disclosed in the offer documents filed in connection with its initial public offer (IPO), in line with the timeline envisaged by the company.

Emmvee's Previous Module Plants

Mapping the growth, Emmvee had earlier opened its fifth module manufacturing facility at Sulibele, near Bengaluru International Airport, adding 2 GWp of photovoltaic (PV) module capacity. This expansion increased the company's total PV module capacity to 6.6 GWp, while its solar cell capacity reached 2.5 GWp.

Emmvee has come a long way from launching a fully automated solar cell and module manufacturing unit in Dabaspet, Karnataka, spanning 500,000 square feet. The unit is located adjacent to the company's 750 MW module facility. This project was part of Emmvee's expansion plan to add a 1.50 GW solar cell line and 3.00 GW of solar module manufacturing capacity. Phase II of the expansion, comprising a 1.50 GW solar cell line and a 1.75 GW solar module manufacturing facility, was officially kick-started in 2023.

Vikram Solar Board Clears ₹4,371 Cr Phase I Capex for Tamil Nadu BESS Unit



Kolkata-based Vikram Solar's Board of Directors has approved a capital expenditure of approximately ₹4,371 crore. The company said in a regulatory filing that the investment will be undertaken through its subsidiary, VSL Powerhive Private Limited, under Phase 1 of its Battery Energy Storage System (BESS) roadmap.

In line with Vikram Solar's plan to commission the project during the ongoing quarter, Powerhive's long-term roadmap envisages phased manufacturing capacity expansion. The planned capacity includes the establishment of 30 GWh of battery cell, module/pack, and BESS manufacturing facilities. As part of Phase 1, VSL Powerhive will commission a 5 GWh BESS manufacturing facility at Oragadam, Tamil Nadu, by FY27.

The company is also further advancing backward integration into battery cell manufacturing, establishing a 7.5 GWh cell manufacturing capacity scheduled to be fully operational by FY29, subject to receipt of applicable statutory and regulatory approvals.

A core component of this venture will be a dedicated Research and Development (R&D) lab, tasked with developing future-ready battery products and innovative solutions to maintain market leadership. The proposed capital expenditure shall be funded through a combination of debt and equity as may be determined by the Board of Directors from time to time, subject to applicable approvals.

Vikram Solar Expands Renewable Energy Portfolio

Vikram Solar has previously commissioned a 5-GW solar module manufacturing facility at Vallam in Tamil Nadu, taking its total installed manufacturing capacity to 9.5 GW. Its Tamil Nadu plant is a 27,000 sq. m facility, is based on TOPCon technology, and is designed for future upgrades to HJT.

These modules can produce modules across M10, G12, and G12R formats. Vikram Solar, earlier this year, also announced plans to enter battery manufacturing besides cell making, with a 1 GWh solid-state battery making plan. The Vallam plant expands the company's footprint in Tamil Nadu, where it already operates a facility in Oragadam and recently began work on another site in Gangaikondan. ●

INOXGFL Commissions First Phase of 3 GW Solar Plant, Inaugurates 1.2 GW Wind Facility in Gujarat

Inox Solar has recently inaugurated its new solar module manufacturing facility, along with Inox Wind's nacelle and hub manufacturing facility, near Ahmedabad, Gujarat. In a statement, Inox Wind announced the inauguration of the first phase of its 3 GW solar module manufacturing facility at Bavla, Ahmedabad, by Gujarat Deputy Chief Minister Harsh Sanghavi on Thursday.

The facility is fully automated and equipped with manufacturing technology to produce N-type TOPCon solar modules using M10R and G12R solar cells. Along with this, the Deputy Chief Minister also inaugurated Inox Wind's nacelle and hub manufacturing facility at Kalyangarh near Ahmedabad, which has a capacity of 1.2 GW. This technology delivers higher efficiency, lower degradation, and superior reliability. The bifacial modules enable dual-sided power generation, significantly enhancing capacity utilisation factors (CUF) and overall energy output.

Built to global manufacturing standards and approved by the National Institute of Wind Energy (NIWE), the facility will manufacture nacelles and hubs for Inox Wind's advanced 3 MW-class wind turbines, as well as its upcoming 4X MW-class turbines. The facility offers improved logistical access to renewable energy project sites across western and southern India, enhancing transportation efficiency and reducing project execution timelines.

Additionally, Inox Clean, through its subsidiary Inox Neo, aims to become the fastest independent power producer (IPP) to install 3 GW of renewable capacity. The nacelle houses the key power-generating components of a wind turbine, including the gearbox, generator, and electrical control systems, while the hub connects the rotor blades to the main shaft—together forming the core of a wind turbine.

The INOXGFL Group, through its subsidiaries, has consistently expanded its presence across the chemicals and renewable energy sectors. The group is an integrated renewable energy player in India, operating across the value chain, including wind manufacturing (Inox Wind), solar manufacturing (Inox Solar), EPC services (Inox Renewable Solutions), operations and maintenance (Inox Green), advanced battery materials (GFCL EV), and independent power production (Inox Neo Energies).

Leadership View

Speaking on the occasion, the Deputy Chief Minister of Gujarat, Harsh Sanghavi, said, "The inauguration of these world-class solar and wind manufacturing facilities reflects the state's strong commitment to clean energy, innovation, and sustainable industrial development. Such investments not only strengthen India's renewable energy manufacturing capabilities but also generate direct and indirect employment, encourage technology leadership, and contribute meaningfully to our national energy security. We are proud to see global-scale facilities being developed in Gujarat that will support India's clean energy ambitions for decades to come."

Commenting on the plant inaugurations, Devansh Jain, Executive Director, INOXGFL Group said, "We express our sincere gratitude to Hon'ble Prime Minister Shri Narendra Modi ji, the Government of India, and the Government of Gujarat for providing the policy framework, promoting domestic manufacturing, and driving the clean energy revolution from the forefront. Our nacelle and hub manufacturing plant inaugurated today will expand Inox Wind's technological offerings to 4X MW class turbines, along with manufacturing 3MW class turbines. This will help us expand our access across sites in Western and Southern India brining in new customers."

Jain added, "We have ambitious growth plan for the solar business where we plan to have a cumulative capacity of 11GW of solar module and 8GW of solar cell manufacturing capacity by FY27 in India and overseas, potentially resulting in the annual revenue upwards of Rs 20,000 crore. With this the total consolidated revenues for Inox Clean will scale to Rs 30,000 crore approximately by FY28.

Europe Turns Spotlight On Solar Inverters With Labelling As "High Risk Dependency'

After dodging strong protective action for a long time, the solar inverter market could be set for significant upheavals in the next few years worldwide outside China. In 2024, 9 of the top 10 solar inverter firms were from China, with Huawei and Sungrow together accounting for almost 55% of the market according to reports. Non-Chinese brands like SMA, SolarEdge, Enphase, Fimer, Fronius etc have all seen market shares tumble in sync with China's rise in the solar market. Chinese firms have also benefited from the obvious advantage of the Chinese market itself accounting for over 60% of the global solar market at times in the past 5 years.

EU Acknowledges Risks

Now, the European Union's (EU) Economic Security Doctrine has identified solar inverters as a high-risk dependency, a move welcomed by the European Solar Manufacturing Council (ESMC) which has been pitching for the kind of protection accorded to the module manufacturing supply chain.

The doctrine includes solar inverters and their supply chains among its assessment of risks to the EU's critical infrastructure with a strong focus on cybersecurity.

It must be noted here that EU plans to protect the European solar manufacturing sector for modules has broadly failed, with the plan failing to arrest the closure and exit of many firms, and the long term future of such manufacturing as it exists still in doubt once subsidies end.

Hence the talk of developing supply chains in other 'trusted' third countries beyond China.

The ESMC has been highlighting the dominance of two Chinese brands that account for over 80% of the EU market's solar systems.

Recent Incidents Add To Security Worries

Solar Inverter security is just one of the many issues that have been raised in the light of Chinese dominance. While some unlisted hardware on devices in the US raised a security flag earlier this year, more recently, it is the dependence on China built Electric buses that has raised concerns, as these have depended on firmware updates from China to run efficiently. Discovered first in Norway, the worry here was linked to the ability to shut down these buses remotely. Chinese moves to use the export of rare earth magnets where it has a 90% global share did not help matters at all.

The hands off approach to solar inverters has its basis in practicality, as Chinese dominance in the entire components chain that goes into solar inverters is very strong, and establishing the same is a lot more complex than the module supply chain, for instance. But looking at current trends and the push for more semiconductor manufacturing around the world, it is safe to say that solar inverters will come under the scanner sooner than later in other markets including India as well. Indian currently has a 20% duty on imported solar inverters. Most so called domestic inverter manufacturers source over 80% or more of their components from China, so even a drop in market share of China-based inverter firms does not give a true picture of the situation here. Effective market share of China's origin' inverters is thus probably closer to 95%. ●

Mufin Green Finance Raises ₹90cr via NCDs To Expand Solar & Clean-Energy Lending

Mufin Green Finance Ltd has raised ₹90 crore through a private placement of secured, rated and listed non-convertible debentures (NCDs) as the non-bank lender seeks to scale its rooftop and commercial solar financing portfolio alongside other green-lending verticals in India.

The company said in an exchange filing that it allotted 9,000 NCDs of ₹1,00,000 each on December 4. The debentures carry a coupon of 11.75% payable semi-annually and have a tenure of 4 years, 11 months and 23 days. The instruments will mature on November 26, 2030, with 99.99% of the principal due for redemption in November 2028 and the balance on maturity. The NCDs will be listed on the BSE.

Boost To Rooftop Solar Biz

Mufin said the funds will support lending across rooftop and commercial solar installations, electric mobility and its health-insurance premium financing business. Solar financing is among its fastest-growing segments, particularly in residential and MSME categories where upfront capital remains a key barrier to adoption.

Managing Director of the firm Kapil Garg said the capital raise comes amid rising demand for credit across clean-energy applications. "The infusion enables us to respond to accelerating demand for renewable-energy and clean-mobility financing with greater agility," he said. He added that the company continues to expand financing for rooftop PV systems, battery-linked projects and EV ecosystems, while also strengthening its mediclaim premium-financing portfolio.

Diversified Portfolio

The company said rooftop solar, EV loans, charging-infrastructure financing and medical-insurance premium credit form a significant part of its disclosed portfolio mix. It added that investor response to the NCD issuance reflects confidence in its risk management and liability strategy.

Mufin Green Finance said the issuance is aligned with its broader funding plan for a diversified green-lending book and meets regulatory requirements for listed NBFCs. The company aims to continue building long-term borrowing channels to support growth in solar and other clean-energy segments.

THE HITS & MISSES OF 2025

2025 proved to be a pivotal year for the Indian solar industry, driven by rapid capacity additions that shattered previous installation records. While India added 23.8 GW of solar capacity during the full year of FY2024–25, the country installed around 27 GW in just the first eight months of FY2025–26, underscoring the sharply accelerated pace of deployment this year. So much so that 40 GW is not looking as unlikely as it would have been just two years ago.

For comparison, India had added only 12.35 GW of solar capacity during the first eight months of FY2024–25, reflecting an increase of nearly 120% year-on-year. This surge in installations also helped India cross the milestone of 50% non-fossil fuel installed power capacity in 2025, achieved five years ahead of its 2030 Paris Agreement target, with solar power emerging as the primary growth driver.

Not only installations, the share of renewable energy in India's total power generation—which was earlier primarily driven by coal—has now seen an upward shift. The share of thermal power fell from 72.25% in 2021–22 to 69.10% in 2025–26. Meanwhile, renewables (including hydro) rose from 24.04% to 26.03%, signalling a slow but steady transition toward cleaner energy sources. Renewable energy generation in India has grown significantly over the last five years, rising by 46%, according to monthly data published by the Central Electricity Authority (CEA).

Rating agency ICRA estimates the share of generation from the renewable energy (RE) capacity, including large hydro, to cross 35% by FY2030 from 22.1% in FY2025, with expected incremental capacity addition of ~200 GW between FY2025 till FY2030.

A latest report from the International Energy Agency (IEA) said that owing to the prolonged monsoon, coal demand in the country declined slightly, leading to greater space for hydropower and renewables in India's energy mix in 2025.

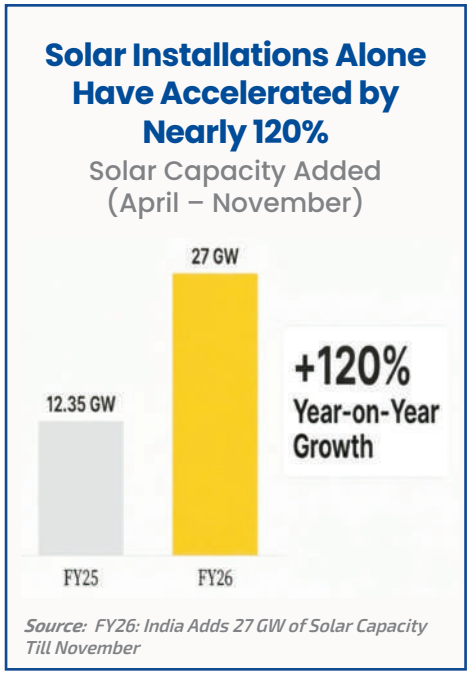
Manufacturing Boost

On the policy front, the country also witnessed the release of its maiden Approved List of Models and Manufacturers (ALMM-II) listing for solar cells, paving the way for a more robust domestic solar cell manufacturing ecosystem. The list currently reflects a total capacity of 23.7 GW, with eight players such as Emmvee Photovoltaics, Mundra (Adani) Solar, Premier Energies, Jupiter International, Waaree Energies, ReNew, and Tata Power. These are mostly legacy companies that were early adopters of solar cell manufacturing, other than ReNew Power of course.

However, it also saw the entry of new solar cell manufacturers such as Waaree Energies, which commenced solar cell manufacturing in 2025 itself. ReNew, which commissioned its solar cell manufacturing facility in late 2024, also saw greater maturity of its cell lines in 2025, widening India's pool of companies offering solar cells to the domestic market.

More than 40 solar module manufacturers have confirmed to Saur Energy about their plans to start solar cell manufacturing. These include companies such as Goldi Solar, Navitas, Cosmic PV Power, GAP Industries, Avaada, Grew Solar and several others. A large number of these firms have also planned to take the IPO route to raise capital for their ambitious expansion plans.

2025 also marked a pivotal year for the solar module industry, which has a much larger number of players compared to the solar cell segment. At the beginning of 2025, India's cumulative ALMM-listed solar module production capacity stood at 109.5 GW. This rose to 144.5 GW by December 2025, an increase in production capacity driven by both expansions



Source: FY26: India Adds 27 GW of Solar Capacity Till November

CHETAN SHAH
Chairman & MD, Solex Energy Limited,

and the entry of new players such as Avaada Group, Eastman, Macwin Solar, Znshine, Green Valley, Inox Solar, and others.

"2025 has been a defining year for India's solar manufacturing ecosystem, marked by strong capacity expansion across modules and cells, reflecting India's steady progress toward clean-energy self-reliance. This growth has been supported by a stable policy direction and continued backing from the Government of India, enabling manufacturers to scale with confidence," **Chetan Shah**, Chairman & Managing Director, Solex Energy Limited, told Saur Energy.

"Policy support from the government has been instrumental in enabling this progress. The consistency and clarity of recent reforms have strengthened industry confidence, allowing us to innovate boldly, collaborate meaningfully, and execute projects end-to-end with greater predictability. We hope to see this momentum continue in the months ahead," said **Devansh Jain**, Executive Director of the INOXGFL Group. The group forayed into solar module manufacturing in 2025, with its planned commissioning in Ahmedabad.

On the other hand, 2025 also proved beneficial for domestic solar glass manufacturers, as the government imposed anti-dumping duties on imported solar glass, providing a level playing field for Indian companies such as Borosil Renewables, Vishakha, and others. With supportive policy measures and improved market prospects, new players also showed interest in entering the segment, with domestic capacity still short of meeting requirements.

Several large and mid-sized conglomerates such as Reliance, Avaada, Emerge, and others have decided to enter the solar glass market with sizeable capacities, while existing players like Borosil Renewables and Vishakha Industries have announced expansion plans. Estimates suggest Reliance is expected to set up around 12 GW of solar glass manufacturing capacity, Avaada is likely to begin with 7 GW, while Emerge plans to add 3 GW. Borosil Renewables expects India's total solar glass production capacity to rise from the current 18 GW to 58 GW by FY27, while pegging domestic demand at about 50 GW.

"These players are definitely entering the market — there is no question about it. Others have also been discussing entry. We expect production to rise significantly; in fact, it will more than double in the country," **Pradeep Kheruka**, Executive Chairman of Borosil Renewables, told investors recently.

BESS & New Verticals

2025 also saw several solar manufacturers foraying into new verticals. Companies such as Premier Energies, Saatvik Solar, and Sunora Solar entered the solar inverter business. Similarly, Premier Energies, Waaree Energies, and others expanded their portfolios to include transformer manufacturing.

However, the standout development was the rapid emergence of the BESS market. Several listed and unlisted companies announced plans to enter this segment. Companies such as Premier Energies, Waaree Energies, Tata Power, Vikram Solar, ReNew, Kosol Energie, and the Adani Group have announced plans to foray into BESS, expanding the roster of established players as the government

DEVANSH JAIN
Executive Director, INOXGFL Group

and industry shift focus toward making variable renewable energy more firm and reliable compared to coal-fired thermal power plants.

Buoyed by lower global lithium prices, India also witnessed some of the lowest tariffs in clean energy projects involving storage. For instance, a solar-plus-storage project at Morena in Madhya Pradesh reported the lowest-ever tariff of ₹2.70/kWh, setting a new benchmark. The project was awarded through RUMSL.

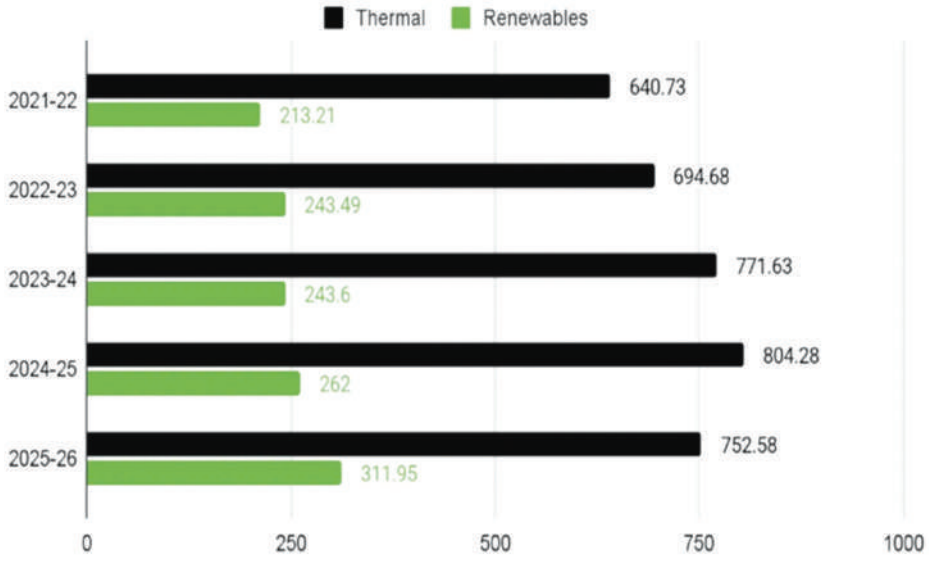
The year also saw increased installations and heightened interest from residential consumers toward rooftop solar under the PM Surya Ghar scheme, driven by enhanced subsidies. This made rooftop solar in the retail segment a significant contributor to overall numbers.

According to a recent report from IEEFA, applications under the scheme saw a nearly fourfold increase between March 2024 and July 2025, providing a boost to the previously lagging rooftop solar segment.

"As of July 2025, PMSGY has witnessed significant traction, with over 57.9 lakh applications for residential rooftop solar installations. The scheme has facilitated the installation of 4,946 MW of rooftop solar capacity till July 2025 across various states and Union territories, indicating robust on-ground execution. Subsidy disbursements have crossed INR 9,281 crore (USD 1.05 billion) benefiting over 16 lakh households, reflecting strong financial support and household-level participation. These figures underscore growing public interest in solar adoption and the effectiveness of central incentives in accelerating clean energy uptake," the report said.

As of December 2025, approximately 23.9 lakh households had rooftop solar systems installed under the PM Surya Ghar scheme across India, according to information furnished by the Ministry of New and Renewable Energy (MNRE) before Parliament. This deployment is estimated to be generating about 7 GW of clean energy.

Thermal Vs RE Generation (April-Oct) In 5 Yrs



Source: Central Electricity RE Generation Data *Compiled By: Saur Energy*

Solar IPOs

The year 2025 also remained noteworthy as several solar companies entered the Indian stock market through Initial Public Offerings (IPOs). The year saw listings of major solar module and cell manufacturers such as Emmvee Photovoltaic, Saatvik Green Energy, and Vikram Solar. Companies such as solar pumps specialist GK Energy and EPC Solarworld Energy also entered the public markets.

Meanwhile, companies such as Rayzon Solar, Avaada Electro, Continuum Green Energy, and Karamtara Engineering filed their Draft Red Herring Prospectuses (DRHPs) with the Securities and Exchange Board of India (SEBI). Additionally, firms like Prozeal Energy, Goldi Solar, Cosmic PV Power, and others announced plans to issue IPOs and list on stock exchanges in due course. Many of these developments are expected to materialise in 2026, with more solar companies likely to announce market listings next year. With these, India is closer than ever to mainstreaming solar stocks, with a specific green index on the horizon as well fpr those looking to place bets on the sector as a whole.

Rajashree Nambiar, Co-founder, MD & CEO of Ecofy, said, "2025 has been a turning point for green financing in India. With

RAJASHREE NAMBIAR
Co-founder, MD & CEO, Ecofy

PRADEEP KHERUKA
Executive Chairman, Borosil Renewables

stronger policy support and clearer guidelines, the sector has moved firmly into the mainstream. Investor interest has grown, and sustainability-focused financial products are now becoming a natural part of business decisions. As the year closes, the priority for the industry is to make green finance easier to access, reduce perceived risks, and ensure climate-aligned products become an integral part of India's financial landscape."

Misses of 2025

Strong IPOs, Weak Stock Prices

Despite the successes of 2025, several challenges emerged as bottlenecks for the Indian solar industry. These included unsigned PPAs for multiple solar projects, as discoms appeared reluctant to commit to certain project formats in anticipation of cheaper future tariffs, IPOs trading below issue prices, lagging solar cell capacity, and rising curtailments.

Several newly listed solar companies saw their share prices fall below IPO levels, indicating that initial optimism did not translate into sustained market confidence. While many firms entered the stock market to raise funds for expansion, declining share prices and subsequent offers for sale by promoters and investors pointed to indicated all is not well. Solar pump firms in fact, faced a strong investor pushback as it became apparent that their working capital situation remained tight despite good margins and strong order books, thanks to the high dependence on government contracts under the PM KUSUM scheme. These firms saw stock prices beaten down to six month lows at the time of filing this story.

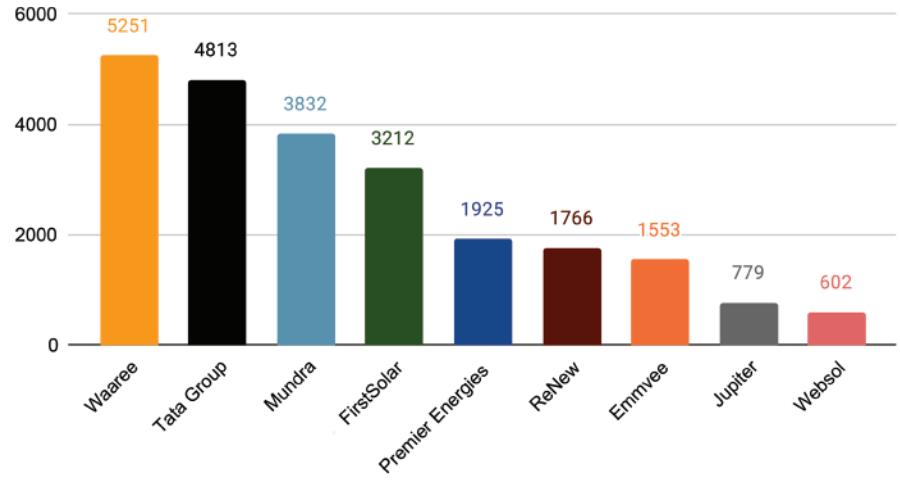
DV Manjunatha, Chairman and Managing Director of Emmvee Photovoltaics, told Saur Energy what could make a difference for solar companies. " Indian investors are quite sharp. They can tell the difference between short-term excitement and businesses that are built to last and market behaviour is influenced by many factors. From my own experience of more than 30 years in this industry, what I have consistently seen is that companies that keep their approach simple tend to do better over time," he said.

DV MANJUNATHA
Chairman & MD, Emmvee Photovoltaics

He added, "Staying disciplined with finances, executing steadily, and having clarity on how the business operates matters more. As the sector further matures, differentiation will come from practical things like adopting the right technologies at the right time, strengthening backward integration, and improving margins in a consistent manner. These are the fundamentals that will eventually build investor confidence."

Cell Shortages

Another major issue faced by the solar industry—particularly installers, EPC companies, and developers—was the shortage of domestically produced DCR-compliant solar cells for projects mandating domestic content. Vendors highlighted both limited availability and higher costs, largely due to the small number of domestic solar cell manufacturers and the government's push for a stronger DCR-compliant market. The government has also announced



the introduction of ALMM or ALCM for solar cells, making it mandatory for Indian solar module manufacturers to use only domestically produced solar cells for eligible projects from June 2026. Experts have reiterated that from 2026 onwards, more integrated firms are likely to be better positioned for survival.

"The DCR market, especially in a post-ALMM environment, provides better demand visibility for domestic manufacturers. While there may be some short-term cost pressure, over time localisation, scale efficiencies, and learning curves would improve competitiveness. Integrated manufacturers are naturally better positioned to manage these transitions and reduce external dependencies," Manjunatha said.

Grid Constraints

National-level data also showed that solar curtailment rates rose sharply in late 2025. For instance, in October 2025, average solar generation curtailment reached about 12%, the highest level recorded by the Grid Controller of India. On some days, up to 40% of solar output was not evacuated due to grid constraints, highlighting the lack of grid preparedness for high renewable penetration.

Project developers stressed the need to focus on building a resilient energy system beyond mere capacity additions. "As India enters the next phase of its energy transition in 2026, the priority must shift from capacity addition alone to building a dispatchable and resilient energy system. This requires focused investment in three areas: grid-scale energy storage, robust transmission infrastructure, and a diversified clean energy mix," said **Srivatsan Iyer**, Global CEO, Hero Future Energies.

He added, "Energy storage will be critical to maintaining grid stability and ensuring reliable, round-the-clock power as renewable penetration increases. At the same time, accelerated development of transmission networks—including high-voltage interregional corridors and smart grid technologies—is essential to move clean power from resource-rich regions to major demand centers."

Ankit Jain, Vice President and Co-Group Head – Corporate Ratings at ICRA, noted that grid curtailments during peak renewable generation hours underscore the urgency of storage deployment and grid strengthening. He added that this comes at a time when ICRA expects electricity demand growth of 5–5.5% in FY2027, rebounding from FY2026's muted growth of 1.5–2%.

SRIVATSAN IYER
Global CEO, Hero Future Energies

"India added 31.2 GW of renewable capacity in 8M FY2026, up 109% year-on-year, supported by a strong project pipeline and favorable solar module prices. While bidding slowed with only 8.6 GW auctioned in 8M FY2026 amid delays in signing of PPAs/PSAs, transmission infrastructure remains a critical focus to sustain capacity expansion. Grid curtailments during peak renewable generation hours highlight the urgency for storage and grid strengthening. These measures are essential to ensure grid stability and enable the sector's continued growth momentum and will remain the key monitorable in FY2027," he added.

Exports Block

Even as India's module capacity emerged as the biggest outside China, the lack of access to the US market hurts, in the absence of a trade deal with that country. Not only was the US India's largest export

ANKIT JAIN
VP & Co-Group Head – Corporate Ratings, ICRA

destination, but it also offered better margins than most other options. With that market shut out for now along with a relentless pressure on renewable energy under the current administration, many module makers have had to relook plans for further expansion, including US manufacturing as well. Other markets, where they exist, are too small or competitive to offer a viable option for now. A good 8-12 GW of prospective sales are therefore out of the picture for now for leading module players.

Conclusion

Taken together, 2025 stands out as a watershed year for India's solar and renewable energy sector—one that delivered unprecedented growth while simultaneously exposing the structural challenges that lie ahead.

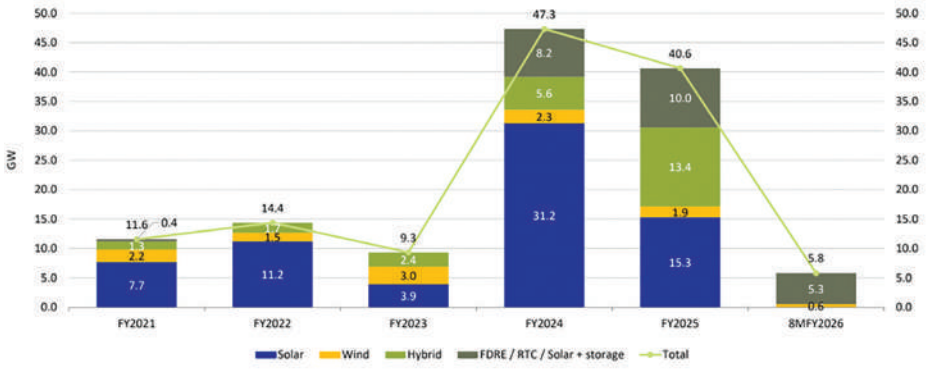
While the manufacturing side will continue to see strong momentum as new cell, and more module capacities come online, other measures like the settlement of the GIB (Great Indian Bustard) issue by the Supreme Court also opens up space for over 20 GW of new capacity in Rajasthan and Gujarat. As pointed out, large players have pushed for integration across the solar chain, seeing this as a generational opportunity that they are confident of tackling on their own. That explains the rush of developers into manufacturing, for instance. In many ways, 2026 could be the year of consolidation, as firms come to grips with their new expansions outside core areas and serving existing market demand. At some stage, critical schemes like PM KUSUM will be redesigned to hopefully expand coverage to smaller farmers, and states where it has not clicked yet. A target date for domestic wafer manufacturing, expected by 2028, will also be announced, putting additional pressure on smaller module players. Today, 1 GW is the minimum cutoff for a serious player, and this size will only go up as more demands are placed for domestic sourcing.

Perhaps most significant will be the roll out of BESS linked projects bid out in 2025, as a successful experience there will drive strong incremental solar and wind demand as well. From a backup of 2 hours to 4 hours to possibly 8 hours by the year end, expect BESS tenders to evolve during 2026 to emerge as Solar's biggest support pillar.

In all this, India's famous value seeking behaviour will rule. Should prices go up in solar or BESS, every 5% increase could mean a higher slowdown in demand in a price sensitive market. So eyes will continue to be trained on the China market, so critical to BESS and solar even today, to look for price signals. So far, the Chinese have delivered with lower prices despite making noises about price controls and more. Will that hold in 2026 is the billion dollar question now. ●

Slowdown in tendering activity; delay in signing PPAs/PSAs

Year-wise RE capacity awarded



Source: ICRA Research

Chinese Export Controls Unlikely To Choke Demand For Storage Batteries In India

Dr Leo ZHAO

VP, Head of Energy Storage, Trina Solar (APAC)

*In this exclusive conversation, **Dr. Leo Zhao,** Head of Trina Storage, unpacks the rapid evolution of utility-scale energy storage — from record-breaking container energy densities to India's fast-shaping BESS market. With insights spanning technology, supply chains, pricing trends and Trina's latest Elementa 3 platform, Dr. Zhao offers a clear view of where the sector stands today and what innovations will define storage by 2030.*

Q How big is Trina's Storage division now, in terms of capacity, installed numbers, order book, and geographical reach?

Dr Leo ZHAO: Trina Storage has rapidly scaled its integrated storage portfolio, delivering 12 GWh to date and supporting a broader project reserve pipeline of roughly 70 GWh. Combining battery cells, DC modules and AC/DC system solutions, we now count 16 GWh of cumulative product deliveries and maintain a global presence across China, Europe and North America. Our 23 Global Service Centers and a dedicated team of over 230 professionals ensure local service, commissioning and lifecycle support for projects worldwide.

Q From 1 MWh in a 20-foot container to claims of 20 MWh in the same size in less than 5 years. What is driving this innovation in storage? Is it just a matter of more efficient cells or more?

Dr Leo ZHAO: The leap from 1 MWh to ~20 MWh in a 20 foot container reflects coordinated gains across cell chemistry, pack engineering and system integration rather than a single breakthrough: higher capacity LFP and other advanced cells, higher voltage architectures and improved chemistries raise intrinsic energy per cell; tighter pack layouts, integrated PCS/BMS designs and enhanced thermal management (including liquid cooling) increase usable capacity safely; and massive market-driven R&D and manufacturing scale have driven rapid cost declines and faster product iteration — together enabling far more energy in the same footprint.

Q How does Trina Storage look at the market in India? How is the firm approaching the market, considering your experience as a cell and module supplier earlier? New consumer segments to aim for?

Dr Leo ZHAO: Trina Storage views India as a priority growth market and is bringing integrated, cell-to-AC storage solutions designed to meet large commercial and utility needs while lowering project risk and

total cost of ownership. Leveraging decades of PV and storage R&D, we offer high-reliability, long-life systems that pair advanced cells, system-level engineering and intelligent controls to help customers meet their investment targets and accelerate deployment; initially, our go-to segments are utility and large C&I, with scope to expand into other verticals as market frameworks.

Q We have seen a trend of very low bid prices at storage tenders in India recently. Are falling prices a given in energy storage, or do you believe it is a time to be cautious about the future?

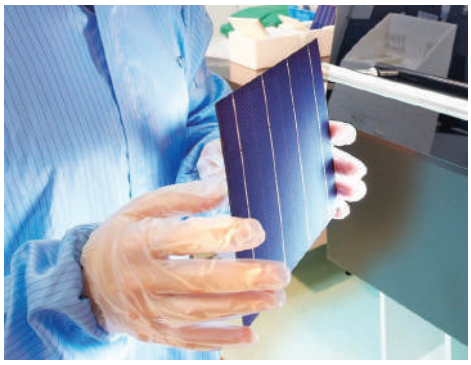
Dr Leo ZHAO: Falling bid prices in recent Indian tenders reflect a mix of structural and market forces, not a single cause. On the supply side, wider adoption of LFP and other higher-density chemistries, scale-up in cell manufacturing, and improvements in pack-level engineering are all driving down capital costs. On the demand side, intensifying tender volumes and competitive procurement compress margins and accelerate cost declines through economies of scale.

Q We have seen China placing export controls on certain types of batteries and related technology recently/ Are those controls likely to impact the demand for storage batteries in India?

Dr Leo ZHAO: China's recent export controls on selected battery materials and technologies introduce a new variable to global supply chains, but they are unlikely to abruptly choke demand for storage batteries in India. Lithium-ion will remain the dominant technology for most energy storage applications in the near term because of its proven performance, mature manufacturing base, and established project economics. That said, the controls increase the strategic value of supply chain diversification, localisation and complementary chemistries.

Q Considering the recent trend of protectionist policies across key markets, how are firms like Trina looking at managing such global volatility?

Dr Leo ZHAO: At Trinasolar we view regulatory volatility as a prompt to double down on innovation and customer value rather than a distraction. Our strategy is to invest in technology leadership, localize where needed, and deliver vertically integrated solutions that customers can deploy reliably across market conditions. Practically this means accelerating R&D (backed by thousands of patent applications and granted patents), designing modular products that are easy to localize and certify, and scaling platforms. For example, our Elementa 3 energy storage platform delivers over 6MWh capacity and integrates high-performance battery cells with up to 12,000 cycles, reducing the levelized cost of storage by 12.5% compared to previous generations. By combining global R&D with regional manufacturing and strong partner ecosystems, we keep customers insulated from policy swings through better-performing, lower-risk products and faster time-to-market.



Q If you had to look ahead, what would be your prediction for the key innovations in energy storage by 2030?

Dr Leo ZHAO: By 2030 the storage industry will advance through a suite of coordinated improvements — diversified chemistries (including commercially mature sodium ion for cost sensitive stationary use), more cost competitive long duration options (flow and hybrid solutions), denser pack designs with safety first thermal controls, and powerful software layers for predictive BMS and large scale aggregation. For Trina Storage, the commercial imperative is clear: deliver platforms that combine those innovations into bankable products.

Elementa exemplifies that approach with its smart, intelligent design (cloud enabled dispatch and predictive maintenance), modular flexibility to serve behind the meter to utility scales, ultra high efficiency to maximise usable MWh per footprint, and comprehensive safety architecture across cell, pack and system levels. Looking ahead, market winners will be systems like Elementa that pair best fit chemistries with advanced controls, standardized lifecycle guarantees and circular supply practices — enabling safer, cheaper and more flexible grids while giving customers predictable performance and lower project risk.

Q Looking beyond large batteries, does Trina have offerings in the 5kW and below segment?

Dr Leo ZHAO: We do not offer residential or small commercial (5 kW+) battery products in the India market. Trina Storage's current India focus is on large commercial and utility scale storage solutions tailored to grid and C&I applications. ●

The Battery Revolution: Why India's FDRE and RTC Projects Face an Existential Crisis

India's renewable energy landscape is undergoing a fundamental shift that threatens the viability of the complex Firm and Dispatchable Renewable Energy (FDRE) and Round-the-Clock (RTC) models introduced just years ago.

While these innovative project structures were heralded as the solution for reliable grid power, a powerful new competitor has emerged: the combination of standalone solar paired with Battery Energy Storage Systems (BESS). The competitive advantages of this simpler, lower-cost alternative are now exposing critical vulnerabilities in FDRE and RTC frameworks.

Shifted Economics: Battery Costs Are Collapsing

Battery prices have been undergoing a dramatic transformation, dropping considerably in recent times. For instance, as per a report released by SBI Capital Markets, the prices dropped nearly 50 percent from about USD 115/kWh (~10,400/kWh) in December 2024 to USD 55/kWh (~INR 5,000/kWh) in May 2025, with further declines in 2025. This has made standalone solar plus BESS combinations dramatically more cost-competitive than the traditional FDRE and RTC structures.

The tariff disparities tell the story. In 2024, the lowest discovered tariff in solar+BESS tenders fell to INR 3.41 per kWh by December 2024, compared to the considerably higher rates for FDRE projects. Meanwhile, FDRE tenders that began in 2023 have seen a range of tariffs: the SJVN FDRE tender discovered INR 4.38 per kWh, while SECI's load-following FDRE tenders from mid-2024 ranged from INR 4.98 to INR 5.60 per kWh depending on demand fulfillment ratios.

The RTC tariffs are comparably high. In the recent SECI RTC-IV tender for 420 MW, the discovered tariff was INR 5.06 - 5.07 per kWh, significantly higher than both standalone BESS and standard solar projects. This represents a fundamental economic disadvantage for developers seeking to finance these complex projects.

Tender Undersubscription and Cancellations

FDRE and RTC projects are struggling to find takers. In 2024, approximately 8.5 GW of capacity in utility-scale renewable energy tenders was undersubscribed, five times higher than in 2023. Energy storage projects, predominantly FDRE tenders, account for approximately 44 percent of this undersubscribed capacity.

More troubling is the pattern of cancellations. From 2020 to 2024, a total of 38.3 GW of utility-scale renewable energy capacity was cancelled, representing 19 percent of the cumulative capacity issued during this period.

In 2023 alone, ESS-based renewable tenders (including FDRE) accounted for two-thirds of the cancelled capacity. This is not a minor market adjustment; it represents a wholesale rejection of the tender model by energy offtakers.

Multiple other FDRE tenders have experienced similar underperformance, forcing tendering authorities to relax bid conditions to attract any participation at all. When SECI's FDRE-II tender initially failed to find buyers at INR 5.59 per kWh, the agency had to reduce the demand fulfillment ratio from 90 percent to 75 percent and relax frequency matching from 15-minute to hourly blocks just to achieve a marginally lower price discovery of Rs 4.98 per kWh.

Why DISCOMs Are Walking Away

The root cause lies in the financial constraints of Distribution Companies (DISCOMs), which are the primary offtakers for these projects. India's state-owned DISCOMs are in severe financial distress, with accumulated losses of INR 6.92 trillion as of March 2024 (up 5 percent from INR 6.59 trillion in 2022-23). Outstanding debt rose by 12 percent in 2023-24 alone, climbing from INR 6.73 trillion to INR 7.53 trillion.

Thus, DISCOMs are reluctant to sign long-term Power Sale Agreements (PSAs) for expensive FDRE and RTC power. The IEEFA's March 2025 report on India's tender-driven renewable market documents that cumulative unsigned PSA capacity has exceeded 40 GW, with SECI tenders alone accounting for approximately 12 GW as of January 2025.

When DISCOMs do commit, they face stringent technical requirements that inflate project costs. The performance bank guarantees for FDRE tenders are approximately 45 percent higher than for corresponding solar tenders, a significant financial burden that discourages developer participation. The fact is that these discoms go by the rationale of getting the clean power at cheaper rates and could wait for a while by not accepting solar projects available at a comparatively higher price.

The Solar Plus BESS Advantage: Simplicity and Control

In stark contrast to the complex FDRE and RTC models, standalone solar paired with BESS offers DISCOMs a fundamentally different advantage: control and flexibility.

Rather than outsourcing demand management to a third-party developer who must maintain stringent performance ratios under penalty, DISCOMs can now procure solar and BESS as separate, simpler components and manage the integration themselves.

The Broader Crisis: 2023-24 Tender Rates as Evidence of Structural Weakness

The tender rates from 2023-24 provide the clearest evidence of FDRE and RTC projects' structural vulnerability:

FDRE Tender Rates (2023-24):

- SJVN FDRE tender (November 2023): INR 4.38 per kWh—the lowest discovered initially, but a market that struggles with demand
- SECI FDRE Tranche II (July 2024): INR 5.59 per kWh—so high that the tender failed to find buyers, forcing rate reductions
- SECI FDRE Tranche IV (August 2024): INR 4.98 per kWh—achieved only after relaxing demand fulfillment ratiosNTPC FDRE tender: INR 4.69–4.70 per kWh—still significantly above competing technologies

RTC Tender Rates:

- SECI RTC-IV (2025): INR 5.06–5.07 per kWh—the most recent standard, reflecting highest complexity requirements
- Earlier RTC tenders (2023-24 period): INR 4.25–4.43 per kWh (REMCL 750 MW RTC auction)

For comparison, standalone solar tenders consistently achieved INR 2.3–2.7 per kWh throughout this period, while government-subsidized standalone BESS tenders are now discovering tariffs as low as INR 2.36–2.38 lakh per MW per month with VGF support.

Strategic Pivot: DISCOMs' Rational Response

When viewed through a DISCOM's financial lens, the choice becomes rational. The discoms in India face increased integration of variable renewable energy, even forcing authorities to curtail green power in some areas due to oversupply. The key problem for them emanates at evening for peak load when the solar hour ends and the dependency shifts more towards thermal power for baseload.

Compared to the obligation of using green power from expensive FDRE and RTC projects, these discoms would love to enjoy cheaper solar power from solar+BESS projects for meeting their peak power demands in the evening from 6 pm-12 midnight. The latter gives more flexibility to the discoms with lesser cost.

Going by the global experiences like from South Australia, we can see how the increased usage of BESS with solar can boost the increased infusion of solar power into the system and enable to making the grid greener.

A financially stressed utility with accumulated debt of INR 6.92 trillion and insufficient revenue recovery will naturally prefer:

1. Modular components (solar and BESS purchased separately) over-integrated FDRE contracts that create fixed cost obligations regardless of actual grid conditions
2. Government-subsidized standalone BESS (40 percent capital support) over FDRE projects that require developers to absorb all integration costs
3. Shorter decision timelines with direct procurement rather than navigating complex FDRE technical specifications and penalties

The arrival of cheap, modular solar-plus-BESS solutions backed by government support has exposed the structural weaknesses of the previous systems. Between 2023 and 2024, the tender landscape fundamentally shifted away from FDRE's complex demand-following models and toward simpler configurations emphasizing peak-hour availability. Cancellation rates in excess of 65% for some FDRE variants and the consistent failure to achieve auction targets demonstrate that this is not a temporary glitch—it is a market signaling that a better solution exists. ●

The Government's 5 Key Initiatives to Support BESS Storage In India

Stationary battery, or grid-scale BESS systems, have seen an unprecedented drop in prices in the past 5 years, with the drop since 2022 especially forcing a rethink across the world on integrating the speed at which these systems can be used. Not only have prices dropped, but efficiencies, safety and modularity and mobility have also improved tremendously for these systems today. From barely 15 GWh of storage capacity added globally in 2020, we are now looking at adding almost 250 GWh in 2025.

A lot of this has been driven by the adoption of LFP technology in a big way by the leading Chinese firms, powered by the kind of innovation and scale China had demonstrated earlier for solar. So much so that today, even as large LFP-based storage systems are mushrooming everywhere, Sodium Ion-based batteries are also on the horizon, to make a likely impact well before 2030. In India, from an initial hope on PSP (Pumped Hydro Storage), the government has pivoted quickly to BESS-based systems for immediate needs, as PSP takes time. We look at the key initiatives that the government has taken that have backed the country's BESS ecosystem to come good. A lot of the moves are inspired by the relative success of the country in solar and wind manufacturing, while some are new for the sector.

1 DIRECT FUND-BASED SUPPORT

By far the most visible backing through direct funding remains the Viability Gap Funding (VGF) Scheme, launched in September 2023. The VGF scheme started off by offering up to 40 percent of the capital cost as budgetary support to make BESS projects financially viable, a huge support at that time when BESS bids were regularly hitting Rs 8 and over per unit. With a high focus on using BESS for grid stability, the scheme reserves a minimum 85 percent of project capacity for DISCOMs.

Wirh an original aim of enabling 4,000 MWh of BESS capacity by 2030-31 backed by an allocation of Rs 9400 crores, the VGF scheme was quick to recognise the drop in prices that enabled an expansion of the program to cover 13.2 GWh of new BESS capacity within the original budgetary budget. The VGF disbursement occurs in five installments aligned with project implementation stages:

10 percent at financial closure, 45 percent upon commissioning, and 15 percent annually for three years post-commissioning. Significant disbursements under this scheme will start coming in from 2026. While the scheme sought to bring down the Levelized Cost of Storage (LCoS) to under Rs 6/Kwh, we are already seeing bids at much lower amounts.

A recent additional push has come from the Power System Development Fund (PSDF) launched in June this year, which allocated ₹5,400 crores to support 30 GWh of BESS capacity at a subsidized rate of ₹18 lakhs per MWh. Focused on state-level energy storage requirements besides state-owned NTPC, with 25 GWh allocated to 15 states and 5 GWh to central energy PSUs.

SUPPORT THROUGH TAX & DUTY RELIEF

Passing on the benefits of ISTS (Inter-State Transmission System) charges to energy storage along with other renewable energy projects,was a key measure. The waiver was renewed in June 2025 to cover co-located BESS projects commissioned by June 30, 2028. The removal of customs duties in the Budget this year on key battery minerals ,including Cobalt and Lithium has gone further to support the BESS manufacturing ecosystem being nurtured in the country.

MANUFACTURING INCENTIVES

Coming to manufacturing incentives, the key has obviously been the PLI (Production Linked Scheme) for battery manufacturing, following the government template across sectors. The scheme, with an Rs 18,100 crore outlay, has had mixed results so far, with most of the winners behind schedule on their manufacturing targets. Meant to support 50 GWh of ACC (Advanced Cell Chemistry) manufacturing capacit,y four companies made the cut initially selected in March 2022- Reliance New Energy Solar Limited, Ola Electric Mobility Private Limited, Hyundai Global Motors Company Limited, and Rajesh Exports Limited—to establish facilities within two years, with incentives disbursed over five years on battery sales. In September 2024, Reliance Industries was additionally awarded 10 GWh of ACC capacity under the scheme's re-bidding process. Incredibly, for such a key scheme meant to strengthen the manufacturing eco-system, a complete front firm with no connection the actual Hyundai Motors was allowed to be picked, besides Rajesh Exports, which had also not covered itself with glory since winning.

REGULATORY MEASURES

Regulatory measures have included the recent CERC proposal on a comprehensive framework for Integrated Energy Storage Systems (IESS), that acknowledges storage as a regulated asset within generating stations and transmission networks. From operational benchmarks like 85 percent round-trip efficiency, 90 percent availability, 5 percent auxiliary consumption, and 12-year depreciation for battery assets, to opening the doors for supplementary tariff options through fixed storage charges and more, the regulations have removed much uncertainty around BESS economics and viability. The CERC allows transmission licensees to install grid-side systems for reliability enhancement and transmission deferral, with revenues from storage services reducing annual transmission charges, making storage a vital cog that contributes to revenues and profits, rather than being just a cost. So much so that today a solar+storage combination is comfortably competing with even thermal power on costs, and risks crowding out wind energy too.

DEMAND GENERATION

On the demand side, India has set a clear pathway to adding storage capacity, which provides both developers and manufacturers a clear sight of future demand from the utility sector. Add to that rising demand from the C&I segment and, in due course, the rooftop segment, and investing for larger storage capacities is no longer the risk it was even in 2023. The clear and strong pipeline of tenders, the push to mandate storage across all renewable projects and now thermal projects as well to smooth energy flow, and an Energy Storage Obligation (ESO) mandate for states has ensured that demand side issues are covered adequately for players to make a move. Add to that the real possibility that, as domestic manufacturing scales up, an ALMM-type regime will come in for storage as well, probably by 2027-28 or 2028-29, and it's a clear push for energy storage while balancing out national priorities on costs and industry maturity.

Going ahead, much needs to be done still, be it shifting storage to a lower GST slab, to creating supply lines for raw materials at competitive rates for the domestic industry. Ancillary services revenue for large batteries will also need to be allowed gradually, to ensure that large, standalone batteries have a case for themselves. ●

Big Relief for RE Sector: CERC Fixes 7 Pain Points in GNA Rules

The Central Electricity Regulatory Commission (CERC) has issued a suo motu order to resolve implementation challenges under the General Network Access (GNA) Regulations of 2022. The amendments are intended to address bottlenecks faced by renewable energy generators and developers. These regulations were notified on June 7, 2022. However, it was also followed by three amendments in 2023, 2024, and 2025. It was the third amendment, issued on August 31, 2025, that introduced the concepts of solar-hour access and non-solar-hour access. This came into effect from September 9, 2025.

The latest order has sought to remove the difficulties in implementing the third amendment. The order follows multiple representations from renewable energy companies and industry associations, including NSEFI (National Solar Energy Federation of India), WIPPA (Wind Independent Power Producers Association), Azure, and Eden, seeking changes to specific provisions of the GNA framework. After reviewing the submissions and examining the practical difficulties cited by the sector, CERC has issued resolutions on seven key issues.

Below are the major issues for which the Commission has proposed corrective measures to ease renewable energy access and integration with the Inter-State Transmission System (ISTS).

1. Timeline for Conversion to Solar Hour Access

Developers and industry associations had requested an extension of the three-month deadline (ending December 9, 2025) for applying for additional non-solar-hour capacity. They pointed to the complexity of capital expenditure decisions, internal approval timelines, and the need to arrange large connectivity bank guarantees.

CERC has accepted this demand and approved a one-time extension of 2.5 months, taking the total time available to 5.5 months from September 9, 2025. The new deadline for renewable energy companies to apply is now February 22, 2026.

2. Treatment of Additional Capacity Installed for Technical Compliance

The Central Transmission Utility (CTU) had previously proposed treating additional inverters or wind turbine generators (WTGs)—installed solely for reactive power compensation or to offset internal losses—as part of the total "installed capacity." This would have required developers to seek higher technical capacity approvals and furnish additional connectivity bank guarantees, even though these components do not inject extra active power into the grid.

CERC has now relaxed Regulation 5.1 on this matter. Developers may install additional inverters, WTGs, or equivalent equipment for technical compliance at the Point of Injection (PoI) without furnishing extra bank guarantees. CTUIL will validate through system studies that such additional equipment is used only for compliance and does not result in active power injection beyond the approved capacity.

3. Grid Drawal for Energy Storage Systems (ESS)

Industry bodies also sought clarity on the ability of energy storage systems to draw power from the grid for charging, after certain RLDCs refused such drawal under Temporary GNA (T-GNA).

CERC has now permitted immediate drawal of charging power for ESS under T-GNA, subject to grid availability and limited to the entity's granted connectivity quantum. This applies to both new ESS projects and existing renewable generators with storage transitioning under Regulation 27.10(e). The Commission has directed CTUIL to complete the

formal drawal studies within four months, after which the drawal arrangement will move from T-GNA to regular GNA.

4. Transitional Rules on Project Location Changes

The third amendment to the GNA Regulations introduced a rule allowing only one change of land parcel for a given project. Developers expressed concern that this rule might apply retrospectively—potentially preventing entities that had already changed land parcels before the amendment from making another change.

CERC has clarified that the restriction is not retrospective. The "one change" limit applies only to requests made after the third amendment came into effect (September 9, 2025). Developers who changed locations earlier will not be disadvantaged.

5. Developer Eligibility for Non-Solar-Hour Access

Developers sought clarity on whether Renewable Power Park Developers (RPPDs) qualify to apply for additional non-solar-hour access under the Right of First Refusal (RoFR). Without this eligibility, park developers holding connectivity would not be able to develop ESS or other non-solar-hour capacity within the park.

CERC has confirmed that RPPDs with existing solar connectivity are eligible to apply for additional capacity for non-solar-hour access under RoFR. However, this eligibility is specifically limited to exercising their RoFR rights under Regulation 5.11(a). The deadline for such applications has already been extended to 5.5 months from the effective date of the third amendment.

6. Rules for Changing the Energy Source of ESS

The third amendment also introduced a one-time limit on changing the energy source of storage systems. Developers sought clarity on whether this rule applied retrospectively.

CERC has clarified that the restriction is not retrospective. Entities with in-principle connectivity granted before the third amendment will be allowed at least one opportunity to change the ESS source after the amendment, regardless of whether they had changed it earlier or whether their earlier 180-month deadline had expired.

7. Land Document Timelines for Delayed Grants

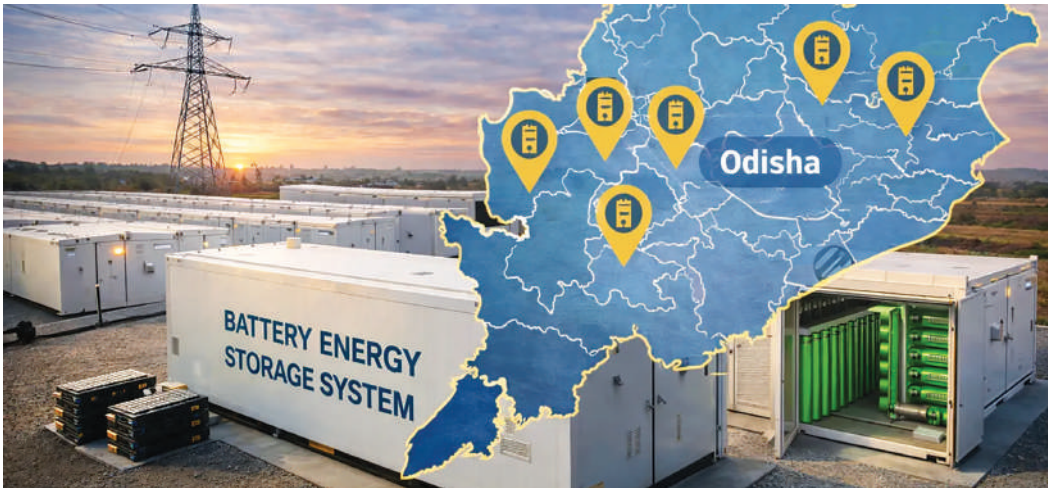
Under the existing rules, developers must submit land documents within 18 months of the in-principle connectivity grant or 12 months of the final grant. Developers highlighted that delays in CTU communication of final coordinates often made compliance impossible.

CERC has clarified that these timelines are tied to the communication of land coordinates. If the final grant is delayed and CTU has not provided coordinates, developers must be allowed at least nine months from the date of communication of final or even tentative coordinates to submit land documents. The Commission has directed CTUIL to implement this to ensure developers are not penalised for administrative delays. ●

SECI Issues 125 MW/500 MWh 4-Hour BESS Tender in Odisha

SECI has recently issued a tender to set up a 125 MW/500 MWh Battery Energy Storage System (BESS) in Odisha and to make an energy storage facility available to GRIDCO for charging and discharging of the BESS on an "on-demand" basis. It has sought online bids for the tender till January 21, 2025, and offline bids till January 23, 2025.

Under the scope of work of the tender, the Battery Energy Storage System Developer (BESSD) is required to set up, operate, and maintain a Battery Energy Storage System (BESS), and to make the energy storage facility available to GRIDCO for charging and discharging on an "on-demand" basis.
Through this tender, SECI aims to select six BESS projects for a 125 MW project with four-hour storage capacity. With a total capacity of 125 MW/500 MWh (i.e., five projects of 20 MW/80 MWh each and one project of 25 MW/100 MWh). The selection will be carried out through e-bidding, followed by a separate e-reverse auction process for each project cluster. The projects will be set up inside identified substations, as per the distribution matrix.



Scope of Work

SECI, under the scope of work of the project, has divided the project in Odisha into three clusters. The first cluster comprises Projects 1 and 2, each with a capacity of 20 MW/80 MWh, connected to the 132/33 kV Padampur GSS and the 220/132/33 kV New Bolangir GSS, respectively.

The second cluster also comprises two projects of 20 MW/80 MWh each, which will be connected to the 132/33 kV Bhatli GSS and the 132/33 kV Basta GSS.

Under the third cluster, Project 5 will include a 25 MW/100 MWh system connected to the 220/132/33 kV Narendrapur GSS, while Project 6, with a capacity of 20 MW/80 MWh, will be connected to the 132/33 kV Tentuli Khunti GSS. ●

SECI tender aims to select six BESS projects for a 125 MW project with 4-hr storage for five projects of 20 MW/80 MWh each and one project of 25 MW/100 MWh. It has sought online bids till January 21, 2025, and offline bids till January 23, 2025

S. No.	Cluster Number	Project ID	Name of the Grid Sub-Station/Project	Connectivity	BESS Capacity
1	Cluster-1	Project-1	132/33 kV GSS Padampur	Space available for 2 nos. of 33 kV Bays	20 MW/80 MWh
2		Project-2	220/132/33 kV GSS New Bolangir	Space available for 2 nos. of 33 kV Bays	20 MW/80 MWh
3	Cluster-2	Project-3	132/33 kV GSS Bhatli	Space available for 2 nos. of 33 kV Bays	20 MW/80 MWh
4		Project-4	132/33 kV GSS Basta	Space available for 2 nos. of 33 kV Bays	20 MW/80 MWh
5	Cluster-3	Project-5	220/132/33 kV GSS Narendrapur	Space available for 2 nos. of 33 kV Bays	25 MW/100 MWh
6		Project-6	132/33 kV GSS Tentuli Khunti	Space available for 2 nos. of 33 kV Bays	20 MW/80 MWh

Source: SECI Tender

Rashtrapati Bhavan To Go Green With 1 MW Solar Rooftop project

The Rashtrapati Bhavan, a landmark monument and heritage structure in the capital that houses the President of India along with a large staff, is going greener. While previous President's have made fforts to ensure the complex is as eco-friendly as possible, it is under President Draupadi Murmu that the complex will shift in a big way to generating its own power as well now, thanks to a 1 MW solar rooftop project.

The project was offered for bids in September through the Solar Energy Corporation of India (SECI), with a bid deadline of October 16. Ahmedabad-based GRE Renew Enertech Limited bagged the award, adding a prestigious project for the firm's solar portfolio. Kamleshkumar Dahyalal Patel, Kirtikumar Kantilal Suthar and Mukeshkumar Prahladbhai Trivedi are the promoters of the company.

The scope of the work included design, erection, testing and installtion of the project, with O&M services for the full 25 year life of the project.

Commenting on the development, Kamlesh Patel, Managing Director of GRE Renew Enertech Limited, said: "We are pleased to be associated with a project of

national importance and to contribute to the adoption of clean energy in public infrastructure."

Solar EPC firms are usually happy to take on such visible, prestige projects at very competitive rates, owing to the ohvious benefits in terms of vbisibility and credibility for the firm executing such projects. We have seen many such efforts linked to churches, Gurudwaras, temples and other such buildings, but among government owned buildings,it doesn't get any bigger and better than the Rashtrapati Bhavan. The power from the project will help the sprawling complex cut down dependence on conventional power sources further.

GE Vernova Wins HVDC Contract for 2.5 GW Khavda–South Olpad Transmission Corridor of Adani Energy

GE Vernova announced that its Electrification Systems business has won a major contract from Adani Energy Solutions Ltd. to supply high-voltage direct current (HVDC) technology for the 2.5-gigawatt (GW) Khavda–South Olpad renewable power transmission corridor in India.

The Khavda–South Olpad corridor is set to form a vital link in India's renewable power infrastructure. Khavda, located in Gujarat's Kutch region, is being developed as one of the world's largest renewable energy zones. South Olpad, in contrast, serves as a key pooling and injection node within India's national transmission grid.

The corridor will enable large volumes of green electricity generated in western India to be efficiently transmitted into the country's broader power network, strengthening the backbone for India's clean energy transition.

GE Vernova's Scope and Technology

Under the new contract, GE Vernova will deliver advanced HVDC systems engineered for large-scale and high-reliability performance. The company will supply a ±500 kV, 2,500 MW (2 × 1,250 MW) voltage-sourced converter (VSC)-based bipolar HVDC system for point-to-point transmission.

The project will be primarily executed by GE Vernova's India-based engineering and manufacturing teams, emphasizing local capability and expertise. Delivery will occur in phases, with project completion targeted by 2030.

GE Vernova has a history in India, notably its HVDC technology contribution to the Champa-Kurukshetra link - one of the country's major power transmission backbones.

Bondada Bags EPC Order For 810 MW RVUNL Solar Park From NIRL, Order Book Rises to 3 GW

Bondada Engineering has secured an EPC order from NLC India Renewables Limited, on behalf of NLC India Limited, for a solar park project. In a regulatory filing, Bondada Engineering said it had secured an EPC order worth ₹945 crore (Nine Hundred and Forty-Five Crore Ten Lakhs Seventy-Three Thousand Two Hundred Only) from NLC India Renewables Limited for Balance of System (BOS) works related to 810 MW solar power projects at the RVUNL Solar Park in Bikaner, Rajasthan, along with EPC and three years of operations and maintenance (O&M).

Bondada Engineering is expected to execute the order within 15 months from the receipt of the Letter of Award (LOA), taking the company's total EPC orders in hand to 3 GW and strengthening its medium-term growth pipeline.

Scope of Work

Under the scope of work, Bondada Engineering will be responsible for the designing, engineering, manufacturing, installation, testing, and commissioning of the 810 MW solar power project (SPP). The company will also undertake the evacuation system up to the delivery point, i.e., the 33 kV side of the 33/400 kV park pooling substation (PSS).

Bondada Engineering Steadily Expands Solar Orders

Bondada Engineering, which began its operations in 2012 with telecom infrastructure services, later entered the solar EPC segment by initially working with private developers. 10 years later, by 2022, it had built strong credentials in the solar EPC space, which subsequently enabled Bondada to begin bidding for public sector projects.

Currently, the company has commissioned around 1 GW of solar capacity, while nearly 2.5 GW is under execution. This includes the Adani's ongoing 650 MW project. Additionally, around 2.5 GW is at the L1 stage, awaiting order finalisation and execution.

Overall, Bondada Engineering's solar EPC portfolio stands at nearly 6 GW. In addition, the company has a 2 GW independent power producer (IPP) portfolio. This growth journey began in 2017, and in 2023, the company was listed on the BSE SME exchange. ●

Oriana Power Secures Rs 186.36 Cr EPC Orders for 50 MW Solar Project in Kerala

Noida-based Oriana Power has recently received purchase orders (POs) from a renewable energy developer for setting up a 50 MW (AC) grid-interactive solar PV power project in Kerala. In a stock exchange filing, Oriana Power said it secured contracts worth Rs 186.36 crore (excluding GST), comprising two individual contracts. The order involves providing end-to-end delivery of the commissioned plant to the renewable energy developer. The company said the project is scheduled to be completed in the financial year 2026–27.

These include a support and alliance agreement for the supply of modules and other components, and a support agreement to provide allied services related to modules and other components.

Scope of Work

Under the contract scope of work, Oriana Power said it would be required to deliver end-to-end delivery of the commissioned plant, including but not limited to design, engineering, and procurement of equipment and materials. This also includes testing at manufacturers' works, packing, forwarding, transportation, supply, receipt, and unloading at the site.

The EPC player will also be responsible for storage and insurance at all stages, associated civil and electrical works, services, permits, and licences. In addition, the company will undertake installation, erection, testing, commissioning, performance demonstration, and operational acceptance of the solar plant. ●

India Monsoon & China Slowdown Flatten Global Coal Demand In 2025: IEA

A latest report from the International Energy Agency (IEA) claimed that the global demand for coal is likely to remain akin to the demand seen in 2024. The global agency said that this could be attributed to the prolonged monsoon period in India and the slower coal power production in China. As per the report, India and China alone accounted for 71% of the global coal consumption.

As per the report, in India, usually a key driver of global coal growth, an early and strong monsoon reduced electricity demand and boosted hydropower generation. This has led to a rare decline in coal-fired power output, marking only the third year-on-year fall in India's coal power generation in the past five decades.

"India remains a key driver of global coal demand, although total consumption in 2025 is expected to see a slight y-o-y decline of 1.2%, falling by 16 Mt to 1 297 Mt. This marginal decrease is primarily the result of a 3% drop in coal-fired power generation, driven by increased hydropower output and reduced electricity demand for cooling, alongside the continued expansion of renewable energy capacity," the IEA report said.

China, the world's largest coal consumer, is also showing little change. Coal demand in the country is on track to match 2024 levels, helped by strong domestic production and slower growth in coal-fired power generation. Because China uses more coal than the rest of the world combined, even small changes there have an outsized impact on global trends.

Minor Rise Globally

As a result, global coal demand in 2025 is expected to rise by just 0.5% to around 8.85 billion tonnes, essentially flat compared with last year and close to record levels, the IEA said in its Coal 2025 report.

Elsewhere, coal demand followed a different path. In the United States, coal use is set to rise by about 8% in 2025, reversing years of decline. Higher natural gas prices and slower retirement of coal plants, backed by policy support, helped lift coal-fired generation.

In the European Union, lower output from hydropower and wind increased reliance on coal in the first half of the year. Even so, EU coal demand is still expected to fall in 2025, though by a modest 2%, far less than the sharp declines seen in the previous two years.

Coal Easing Down From 2030

Looking ahead, the IEA expects global coal consumption to level off and begin edging down toward the end of the decade. By 2030, demand is forecast to be about 3% lower than in 2025, with coal-based power generation dropping below 2021 levels.

India is expected to remain the main source of growth, with coal demand projected to rise by around 3% a year through 2030, adding more than 200 million tonnes. Southeast Asia is set to see the fastest growth, while China's coal use is expected to decline slowly—unless higher electricity demand or slower renewable rollout changes the picture.

Global Coal Production

On the supply side, global coal production is expected to stay near record levels in 2025 before easing in the years ahead. Coal trade is also under pressure, with global imports forecast to fall after peaking in 2024. Prices have continued to soften this year, reflecting weaker demand and ample supply.

Together, the trends suggest global coal use is no longer growing rapidly, even as it remains deeply embedded in power systems—especially in Asia—during the ongoing energy transition.

FDRE Projects Could Reach Cost Parity with New Thermal Plants By 2030: Report

India can secure reliable, round-the-clock clean power at costs competitive with new thermal plants by 2030 under realistic market conditions, with the possibility of achieving cost parity as early as 2025 under more favourable circumstances, a new report has found.

The study, Budgeting for Net Zero: Powering India's Reliable Clean Energy Future, by the International Institute for Sustainable Development (IISD) and the Center for Study of Science, Technology and Policy (CSTEP), finds that firm and dispatchable renewable energy (FDRE)—hybrid projects combining solar, wind, and battery storage—can match or undercut the cost of new thermal power plants when developers can monetize both a portion of surplus electricity from oversized renewable capacity and additional storage.

Already Cheaper Than Coal

FDRE projects install slightly more renewable and storage capacity than required for contracted supply; selling this surplus power plays a crucial role in reducing overall costs. FDRE—one of several types of tenders for firm clean energy—is already far cheaper than new coal when the full social costs of thermal power generation are considered.

Without accounting for social costs, the study identifies three cost-parity timelines, depending on how much surplus power developers can sell into the market:

- 2025 when 100% of surplus power is monetized
- 2030 when 50% of surplus power is monetized
- 2047 when 30% of surplus power is monetized

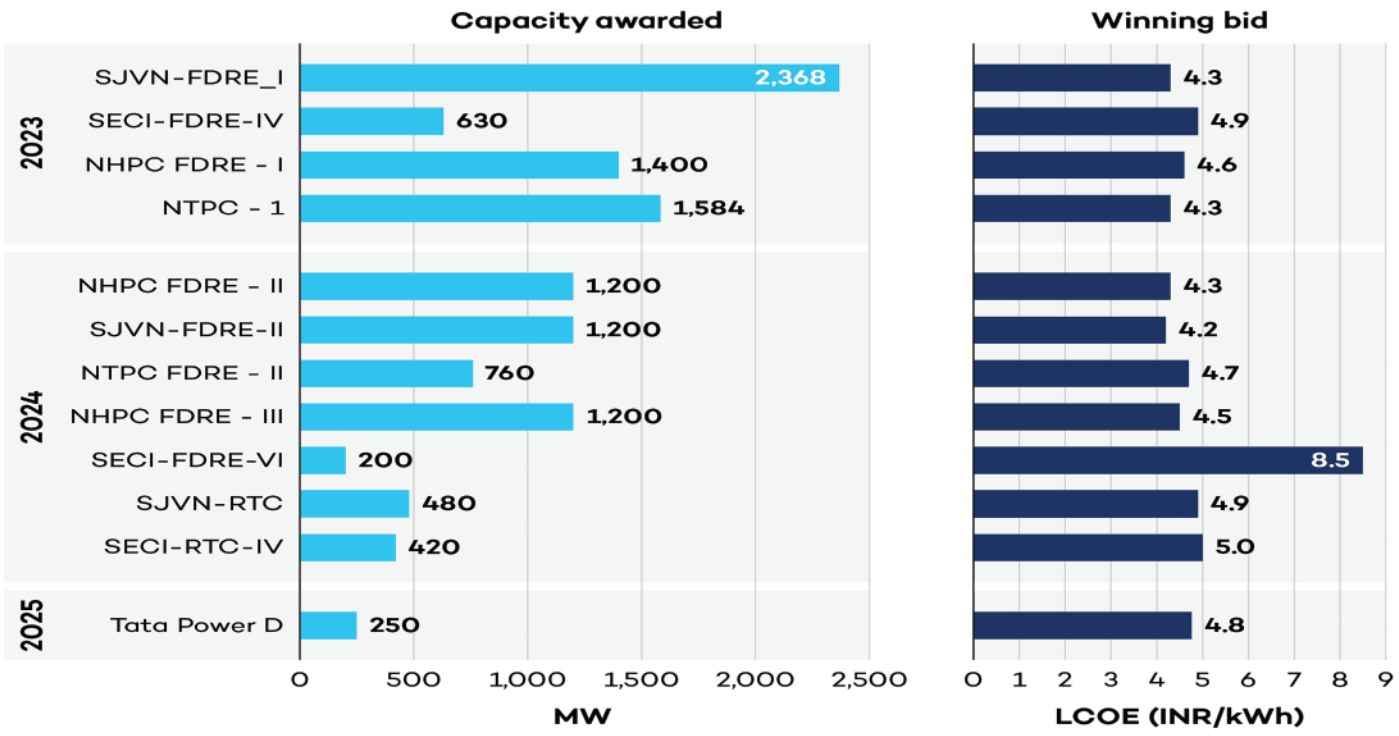
"Firm and dispatchable renewables are not just a clean alternative—they are an increasingly competitive source of reliable power. With thoughtful tender design and market reforms, India can tap into FDRE to meet rising electricity demand, cut long-term costs, and build a power system that is both resilient and future-ready," said Sunil Mani, policy advisor at IISD.

Conditions For Competitiveness

The study examines when and under what conditions FDRE can compete with new thermal capacity, whether government support is needed to accelerate deployment, and the macroeconomic impacts of scaling FDRE. It also evaluates how tender design, developer strategies, and electricity market reforms influence FDRE's affordability.

FDRE marks an important shift in India's clean energy procurement. Instead of simply adding variable renewable energy to the grid, FDRE tenders require developers to supply clean electricity during specific, often peak hours aligned with distribution companies' (discoms) demand patterns. This is increasingly relevant as India's power

Timeline and status of FDRE tenders awarded by central agencies



Seorce: *Authors' compilation based on official FDRE tender documents.*

needs rise and discoms face higher costs from managing variability through short-term markets and limited access to flexible supply. FDRE offers one pathway to scale renewables while maintaining reliability and cost predictability for both discoms and consumers.

Challenges in FDRE Tenders

Although early FDRE tenders have faced challenges—including uncertainty around the optimal renewable–storage mix and monetization of surplus power—9.7 GW of FDRE capacity is already under construction, and recent bid prices closely match the study's cost projections.

The report stresses that FDRE is not intended to replace all other clean energy solutions. Because FDRE guarantees firm delivery, it is naturally more expensive than standalone solar, wind, or storage when a round-the-clock supply is not required. The authors emphasise that a balanced approach—deploying FDRE where demand profiles justify it and expanding lower-cost renewables and storage elsewhere—will deliver the most efficient outcomes for India's evolving power system.

"FDRE can play an important role alongside standalone renewables, storage, and smarter grid management to support India's clean energy transition," said Dr. Anasuya Gangopadhyay, senior associate in the Climate Change Mitigation team at CSTEP.

Beyond Energy Costs: Health, Climate, and Jobs

The report also highlights that comparing FDRE and coal solely on energy costs ignores coal's full societal burden. When air pollution and climate-related damages are included, the effective cost of new pithead coal rises from INR 4.65/kWh to INR 13.19/kWh, making FDRE immediately cheaper across all scenarios.

In addition, FDRE improves energy security: it reduces exposure to fossil fuel price volatility and can be deployed within 2–2.5 years, compared to 5–7 years for new coal plants.

Beyond costs, scaling FDRE would increase India's GDP by 1.8% by 2050, create 64,000 net new jobs, and reduce public health costs linked to air pollution, while strengthening energy security by lowering dependence on fuel imports.

The study identifies several policy options to strengthen FDRE tender design and create market conditions that support deployment, including more flexible demand-fulfilment ratios, capacity payments for storage, improved penalty structures, expanded revenue opportunities, and enhanced resource adequacy planning at the state level.

Ola Electric Commences Mass Deliveries of 4680 Bharat Cell Powered Vehicles

Bengaluru-based Ola Electric has begun mass deliveries of its 4680 Bharat Cell-powered vehicles. In a press release, the company said its S1 Pro+ (5.2 kWh) is the first product to be powered by its indigenously manufactured 4680 Bharat Cell battery pack. The announcement follows Ola's earlier test rides of Bharat Cell-powered vehicles at its stores across India in November this year. Ola has developed the S1 Pro+ (5.2 kWh) as its first vehicle equipped with the indigenously manufactured 4680 Bharat Cell battery pack.

With its own battery packs installed in its vehicles, Ola Electric becomes one of the few Indian companies to fully own both the battery pack and cell manufacturing processes in-house. The move hasn't come without its share of controversies though, almost standard with Ola now. This time it was accusations of infringing on technology owned by LG that became an issue, before it was strongly refuted by Ola Electric.

An Ola Electric spokesperson said, "The excitement for S1 Pro+ has been phenomenal. Deliveries are now in full swing, and customers are proudly riding India's first scooters powered by our own 4680 Bharat Cell. With the national rollout starting soon, we are now ready to take this breakthrough product and technology to every corner of the country."

About Ola's Product

Further demonstrating its product, Ola said that its S1 Pro+ (5.2kWh) is powered by a 13 kW motor, which offers performance with acceleration from 0 to 40 km/h in just 2.1 seconds.

The company also said that is S1 Pro+ (5.2kWh) comes with a range of 320km (IDC with DIY mode). S1 Pro+ gets four riding modes - Hyper, Sports, Normal and Eco and also offers enhanced safety with category-first dual ABS, and disk brakes in front and rear.

Ola Electric Scooter

Ola Electric currently offers an expansive portfolio of S1 scooters and Roadster X motorcycles. The premium S1 Gen 3 portfolio includes S1 Pro+ in 5.2kWh, and 4kWh configurations, and S1 Pro in 4kWh, and 3kWh configurations priced at ₹1,90,338, ₹1,70,338, ₹1,44,999, and ₹1,24,999, respectively.

The company's mass market offerings include Gen 3 S1 X+ (4kWh), and Gen 3 S1 X (2kWh, 3kWh, and 4kWh) priced at ₹1,19,999, ₹84,999, ₹98,999, and ₹1,14,999, respectively. The company's sports scooter portfolio includes the S1 Pro Sport in 5.2kWh, and 4kWh configurations priced at ₹1,64,999 and ₹1,49,999, respectively.

The company's Roadster motorcycle portfolio comprises of Roadster X+ (4.5kWh), and Roadster X (2.5kWh, 3.5kWh, and 4.5kWh) priced at ₹1,29,999, ₹99,999, ₹1,09,999, and ₹1,24,999, respectively.

Building Battery Cells' Capacity

Ola also shared the company's perspective on adding captive battery cell capacity. Bhavish Aggarwal, Chairman and Managing Director, Ola Electric Mobility, said during an investor call, based on the cell cost, parity will be around 3-5 GWh, which remains the same.

On the cell Bill of Materials cost (BOM) cost, Aggarwal said the cell business will make a good gross margin from the beginning because the BOM cost is better than its procurement cost from outside, but definitely, there will be some yield improvements; it will be a journey to the 3-5 GWh threshold.

Why Ola Isn't Planning To Enter the BaaS Model

Bhavish Aggarwal - Chairman and Managing Director, Ola Electric Mobility, has hinted at not opting for Battery as a Service (BaaS). Aggarwal emphasised that battery as a service isn't selling in the market even for Ather or other companies.

The company said it does not see Battery-as-a-Service (BaaS) as a meaningful business opportunity, arguing that the model today functions largely as a financing scheme rather than a technology differentiator. Explaining the rationale behind it, he said, 60–70% of customers already finance their vehicles, and the company believes BaaS offers little added value, making it a non-priority area.

Instead, the company is focusing on developing its own battery cells and increasing vehicle range, particularly through its 4680 cell technology. It said longer range is what customers truly want, and improving this will help the company expand into the next segment of the market. ●

Kerala To Host India's First State-Led Electric Truck Corridor Under PM E-DRIVE

Kerala is laying the groundwork to become the first Indian state to operationalise an electric truck corridor, aligning its freight electrification plans with the central government's PM E-DRIVE scheme, state officials said on Tuesday.

The proposed corridor will run along National Highway 66 (NH-66), a key freight artery that carries a significant share of Kerala's port-linked and industrial cargo. The initiative is being led by the Kerala State Electricity Board Ltd (KSEBL), the state's designated nodal agency for PM E-DRIVE, in collaboration with the International Council on Clean Transportation (ICCT).

The state hosted a high-level workshop bringing together senior government officials, utilities, electric vehicle manufacturers, logistics companies and technical experts to coordinate actions needed to accelerate electric freight adoption.

Allocation of Rs 2,000 crore

PM E-DRIVE, which has an allocation of Rs 2,000 crore, aims to support the rollout of charging infrastructure for electric trucks (e-trucks) and buses along major national and state highways.

At the event, Kerala's Minister for Electricity, K. Krishnankutty, launched a dedicated web portal developed by KSEBL to facilitate implementation of the PM E-DRIVE scheme on privately owned land under Category C. The portal allows eligible charge point operators to upload details of suitable land parcels, enabling faster aggregation and submission of proposals to the Ministry of Heavy Industries for approval.

"To meaningfully reduce pollution from freight movement, it is essential to accelerate the electrification of medium and heavy commercial vehicles," Krishnankutty said. "PM E-DRIVE provides a timely opportunity to deploy the charging infrastructure needed to support this transition."

Among the firsts

Kerala was among the first states to aggregate land parcels and submit proposals to the Ministry of Heavy Industries under PM E-DRIVE, even before the formal designation of a nodal agency, officials said.

The state has more than 300,000 electric vehicles registered, accounting for over 10% of new vehicle sales, among the highest penetration rates in India. Officials said this existing ecosystem provides a foundation for scaling electric freight.

Medium To Heavy-Duty Electric Trucks

Minhaj Alam, chairman and managing director of KSEBL, said the utility's focus would be on building a "reliable, scalable and user-friendly" charging network for medium- and heavy-duty electric trucks.

Additional Chief Secretary (Power) Puneet Kumar said state submissions under PM E-DRIVE would prioritise high-capacity charging configurations of 120 kW and 240 kW to support long-haul freight operations.

NH-66 is expected to see rising freight volumes due to the expansion of Vizhinjam port and growing coastal industrial activity. State officials said electrifying freight along the corridor could help curb emissions, lower operating costs for industries and improve air quality in densely populated districts.

Medium- and heavy-duty trucks are among the largest contributors to road transport emissions in India. Officials said Kerala's corridor-based approach could serve as a model for electric freight deployment nationally.

Top 5 Solar-Related Queries From Consumers

*To increase consumer awareness, Saur Energy has launched a new initiative called "Solar FAQs" with a dedicated website—**www.solarfaqs.in.** With the help of industry experts and our editorial team, we aim to answer various questions from consumers related to the solar sector. Below are the top 5 questions we've received from solar consumers, along with their answers. Consumers can send their questions to **info@saurenergy.com.***

1 What Is This GNA Regulations All About and How It is Linked With Renewable Energy?

by Madvi Saxena

The General Network Access (GNA) framework came into effect after the Central Electricity Regulatory Commission (CERC) notified the GNA Regulations on June 7, 2022. The regime establishes a non-discriminatory and flexible mechanism for both renewable and conventional generators to access the Inter-State Transmission System (ISTS). It aims to reform grid access by simplifying procedures and improving transparency in transmission planning.

2 What Are The Different Types of Encapsulants Available?

By Manohar Sharma

In India, solar manufacturers mainly use three types of encapsulants: EVA, POE, and newer TPO or hybrid co-extruded materials. EVA is the industry workhorse because it is affordable and offers good clarity, but it can yellow over time and is more vulnerable to moisture and PID, especially in hot and humid regions. POE has become popular for advanced modules like TOPCon and HJT since it provides stronger protection against moisture and PID, along with better long-term reliability, though it costs more and takes longer to laminate.

3 Can we get subsidy under PM Surya Ghar if I want to expand my solar capacity

by Lovely Yadav

Under the PM Surya Ghar Scheme, there is a cap on the capacity of a solar plant that a residential household can install. In most states, the sanctioned load or household meter capacity determines the maximum permissible system size. The scheme also places a limit on the total subsidy that can be availed. For instance, if a household has already received a subsidy of Rs 78,000 for a 3 kW system, it cannot claim additional subsidy for future system expansion, even if such an expansion is permitted under state power regulatory rules.

4 Which is the firm Indian firm to install merchant BESS in India and what is this?

By Madhav Nath

Juniper Green Energy Ltd has commissioned 60 megawatt-hours (MWh) of its 100 MWh merchant battery energy storage system (BESS) project in Bikaner, Rajasthan, marking its first operational merchant storage asset, the company said on Wednesday. A merchant battery energy storage system (merchant BESS) is a grid-connected battery project that operates without a long-term power purchase agreement and instead earns revenue by participating directly in electricity markets.

5 Which Indian solar cell makers are making TOPCon cells?

by Bushra Shadab

As per the third ALMM (Cells) of the MNRE, there are four enlisted solar cell makers who are based TOPCOn based solar cells. Their cumulative capacities to around 7.4 GW.The manufacturers include-Waaree (3.9 GW), Mundra (Adani) Solar (1.8 GW), Emmvee (1.5 GW) and TP Solar (53 MW). ●

ACME Solar Appoints Ayalur Kumar As Chief Procurement Officer & Supply Chain

AYALUR KUMAR

Gurugram-based ACME Solar Holdings Ltd (ACME Solar) has appointed Ayalur S. Kumar as its new Chief Procurement and Supply Chain Officer. In a press release announcing the appointment, ACME Solar said the move would strengthen its leadership team as the company accelerates its growth plans to achieve 10 GW of operational contracted capacity by 2030 in the renewable energy business.

Kumar brings 30 years of experience in procurement, supply chain strategies, operations, and logistics across renewable energy, electric vehicle (EV) infrastructure, biorefinery, and power sectors, including more than 15 years in senior leadership roles.

He has deep expertise in building and scaling procurement organizations, leading cross-cultural teams, driving supplier relationship management and sustainability assessments, and optimizing globally aligned yet locally anchored supply chains, with a track record of high-tech component sourcing, project insurance optimization, and technology transfer.

His prior roles with Fortum, Skoda Power, ABB, and Alstom, along with a strong academic foundation that includes a B.Tech in Mechanical Engineering and an MBA in International Business from IIFT, New Delhi.

Vikram Solar Onboards Arun Mittal to Lead its Energy Storage Arm

ARUN MITTAL

Kolkata-based Vikram Solar has appointed Arun Mittal as the Chief Executive Officer of its subsidiary VSL Powerhive, established to meet energy storage systems and solutions demand.

In a press release, Vikram Solar explained the rationale behind the latest appointment. The company said that as energy storage becomes central to grid stability, peak management, and round-the-clock renewable power, VSL Powerhive will play a key role in anchoring the company's goal toward an integrated energy transition solutions company.

Arun Mittal has 31 years of work experience at Exide Industries Ltd., rising from the Management Trainee position to Executive Director (ED) of the Automotive and Industrial Divisions, which was marked by innovation, market expansion, and capability building. He is also a member of ICAI, ICSI, and ICMAI.

Supporting Vikram Solar BESS Expansion

Mittal's appointment is timely as the company is now executing the next leg of its growth plan with a further 6 GW module expansion underway, set to raise total capacity to 15.5 GW. Vikram Solar has earlier commissioned its new 5 GW facility, with its module capacity having more than doubled from 4.5 GW to 9.5 GW.

This is complemented by a 12 GW solar cell capacity currently being executed for commissioning in FY27, reflecting the company's commitment to deepening backward integration and strengthening India's solar manufacturing ecosystem.

Regional Sales Manager
Enphase Solar Energy Private Limited

Enphase Energy, a global energy technology company, delivers smart, easy-to-use solutions that connect solar generation, storage and management on one intelligent platform. The Company revolutionized solar with its microinverter technology and produces a fully-integrated solar plus storage solution. Enphase has shipped more than 20 million microinverters, and over 895,000 Enphase systems have been deployed in more than 125 countries.

Location: Bengaluru, India.

Job Description:
The Regional Sales Manager responsibility include driving Enphase revenue and share growth in a defined set of partner/installer accounts, regions and recruits/enables new partners/installers.

Essential Responsibilities:
- Build and manage a successful installer network to achieve sales targets for the region
- Build and manage a strong sales funnel, systematically capturing opportunities at each stage (lead to revenue) and driving conversions
- Manage revenue, forecast at individual account level with specific actions (marketing programs, promotions etc) to grow each of them
- Contribute to strategic business plans for the region, incorporating TAM/SAM/SOM
- Manage together with the Sales Team the day-to-day communications with the assigned distributor and installer accounts, be a team player, Drive distributor and customer issue resolutions
- Work closely with digital marketing team to define new areas and content topics for lead generation

Eligibility Criteria:
- Bachelors/master's degree in Engineering or business management
- 5+ years sales of experience in Solar Industry
- Solar products and services sales management experience with a strong related network connection
- Experience with digital campaigns, lead generation and management etc... preferred
- Passionate to about selling with value and growing profits
- Flexible, with a "can-do" attitude and the ability to work in a dynamic fluid environment, willing to roll up his own sleeves.
- Ability to work independently and be self-motivated

Apply: https://bit.ly/497rb4y

Project Engineering Lead for MECIS Projects
Larsen & Toubro limited

L&T Hydrocarbon Engineering (LTHE) is an engineering, procurement, fabrication, construction and project management company providing integrated 'design to build' solutions to large and complex Offshore and Onshore hydrocarbon projects worldwide. As a subsidiary of Larsen & Toubro Limited (L&T), a USD 21 billion technology, engineering, construction, projects, manufacturing and financial services conglomerate, L&T Hydrocarbon Engineering is positioned to sharpen its focus on service to its customer base and enhance responsiveness in all its engagements.

Location: Chennai, India.

Job Description:
The candidate shall be responsible for preparing, reviewing, and managing engineering documentation for SCADA, PLC, PPC, and Battery Energy Storage Systems (BESS) in solar power projects. Ensures compliance with project specifications, industry standards, and regulatory requirements. Develops system architecture diagrams, control philosophy documents, communication interfaces, and wiring schematics

Essential Responsibilities:
- Oversee detailed engineering activities, including system design, equipment selection, and integration. Knowledge of Designing the Engineering documents like GAD, RFQ, FDS, FAT, SAT, Signal List etc.
- Plan and execute commissioning activities for PV and BESS systems, including SCADA integration and performance validation.
- Lead end-to-end project execution for photovoltaic (PV) and battery energy storage system (BESS) SCADA projects, ensuring adherence to scope, budget, and timelines.
- Lead a multidisciplinary team of engineers and technicians, providing guidance and support to achieve project objectives.

Eligibility Criteria:
- DIPLOMA or bachelor's degree in electrical, Electronics, or Renewable Energy Engineering (Master's degree preferred).
- Minimum 8-10 years of experience in project engineering and commissioning within the renewable energy sector.
- Proven track record in managing PV and BESS projects with SCADA, PLC integration.
- Familiarity with energy storage systems, including battery chemistry, degradation, and charge-discharge cycles.

Apply: https://bit.ly/4pU6qk9

Asst Manager / Deputy Manager – Approvals and Permits
ib vogt GmbH

ib vogt, one of the world's leading integrated PV developers, delivers superior and sustainable impact and performance. We aim to always be at the forefront of technology, solutions, the marketplace and opportunities while delivering high-quality large-scale PV Power plants to our customers worldwide.

Location: Gujarat, India.

Job Description:
Responsible for managing government approvals, permits, and regulatory compliance for solar and renewable energy projects, ensuring timely clearances through effective coordination with authorities and internal teams.

Essential Responsibilities:
- Planning, preparation, submission, & getting various approvals/ permits from concerned Govt Authorities like GEDA, GETCO etc.
- Working closely with the Project Development team, follow-ups with Clients and Govt Authorities regarding Approvals and Permits for Projects and related documentation, Collecting, updating, and sharing market intelligence including competition with HO on regular basis
- Co-ordinate with Client, Vendor, Project Development teams and ensure all compliances are made on a timely basis.
- Close coordination with the Land team and Engineering team is needed to assess feasibility and availability of Land nearby proposed potential sites.

Eligibility Criteria:
- B.Tech or any graduate with sufficient exposure to the renewable energy sector.
- Minimum 5 years' experience with 1 years of relevant & prior experience in Solar+ Wind (Hybrid) Project Development (Approvals and Permits related).
- Software skills - MS office (hands-on), writing letters.
- hall have strong liaising skills at state level agencies and thorough understanding of policy and regulations.
- Must have worked with RE developer in Gujarat State.
- Thorough understanding of the functioning of Solar and Wind Power Projects.

Apply: https://bit.ly/4seLXry

DM- Solar Asset Management
ReNew Power Limited

Founded in 2011, ReNew, is one of the largest renewable energy companies globally, with a leadership position in India. Listed on Nasdaq under the ticker RNW, ReNew develops, builds, owns, and operates utility-scale wind energy projects, utility-scale solar energy projects, utility-scale firm power projects, and distributed solar energy projects. In addition to being a major independent power producer in India, ReNew is evolving to become an end-to-end decarbonization partner providing solutions in a just and inclusive manner in the areas of clean energy, green hydrogen, value-added energy offerings through digitalisation, storage, and carbon markets that increasingly are integral to addressing climate change.

Location: Gurugram, Haryana.

Job Description:
Lead and manage the solar asset portfolio's operational and financial performance, including budgeting, cost optimization, spares and inventory oversight, SAP support, insurance and regulatory coordination, and cross-functional collaboration to ensure efficient and reliable solar plant operations.

Essential Responsibilities:
- Budget preparation, tracking & control for Solar portfolio.
- Support BD team for providing O&M costing related inputs
- Cost optimization and revenue recovery.
- Support PR process in SAP and coordination with SCM for timely issuance of PO.
- Coordination for Insurance claims
- Coordination for Regulatory, Compliances, M&A, DD, Contracts
- Plan and manage special tools required for testing and analyzing Solar projects.
- Responsible for managing SAP-MM and PM related requirements.
- Spares & Inventory Management, provide Spares & Material report .
- Coordinate with Procurement, Finance, Legal, HR, Admin & other teams for O&M related issues.
- endor & Statutory payment support to site team.
- Coordinate periodic planning meetings related with SAM.
- Identify training need and arranging training as per user requirement.

Eligibility Criteria:
- BE/B.Tech – Electrical Engineering
- 8-10 years

Apply: https://bit.ly/3L1nx4i

Block Head - Solar
Adani Green Energy Ltd

AGEL is part of the Adani Group's promise to provide a better, cleaner, and greener future for India. Driven by the Group's philosophy of Growth with Goodness', the Company develops, builds, owns, operates, and maintains utility- scale grid-connected solar, wind farm and energy storage (Hydro PSP and Battery) projects.

Location: Gujarat, India.

Job Description:
Deputy Project Manager is responsible for supporting the successful execution of engineering projects within the plant, ensuring that construction, maintenance, and upgrade activities are completed on time, within budget, and in compliance with safety, quality, and regulatory standards.

Essential Responsibilities:
- Collaborate closely with the engineering teams to develop and refine comprehensive engineering plans that align with the plant's operational goals, sustainability initiatives, and environmental requirements, ensuring that all aspects of the project are carefully scoped and accounted for.
- Develop and maintain detailed and realistic project schedules, utilizing advanced project management tools and software to track and adjust timelines as needed, ensuring that critical milestones are achieved on time while considering resource availability and unforeseen challenges.
- Support the Lead - Civil in supervising and guiding the civil team, ensuring that each team member is effectively assigned tasks according to their skill set and project requirements, while fostering a collaborative and efficient working environment.
- Ensure that all engineering activities and projects are fully compliant with local, national, and international regulations, including environmental, safety, and construction standards, by regularly reviewing guidelines and working with legal and regulatory bodies to keep the project on track.

Eligibility Criteria:
- Bachelor's degree in Engineering or Construction Management.
- 18+ years of experience in civil engineering or construction in the energy or infrastructure sector.
- Experience in project planning, site supervision, and construction management.

Apply: https://bit.ly/4ar5peq

Systems Engineer, Solar Power Plant Solutions
Nextracker Inc.

At Nextracker, we are leading in the energy transition, providing the most comprehensive portfolio of intelligent solar tracker and control software solutions for solar power plants, as well as strategic services to capture the full value of solar power plants for our customers.

Location: Hyderabad, Telangana.

Job Description: The Staff Systems Engineer, Solar Power Plant Solutions will be based in Hyderabad, India. In this position, you will report to the Director, Systems Engineering. We are seeking a highly skilled system engineer supporting the development of single axis solar trackers and other solar power plant equipment for power distribution, power conversion, inspection and maintenance.

Essential Responsibilities:
- Regularly communicate with the Product Management team to understand the product needs and translate them into engineering requirements and design solutions.
- Perform system architecture design, including functional block diagrams and interface definitions.
- Develop and manage system level requirements from definition to implementation and verification.
- Drive all engineering disciplines and work closely with manufacturing teams through the development cycle to bring the product from concept to mass production.

Eligibility Criteria:
- Knowledge of Python, MATLAB, or other high-level general-purpose programming language.
- Experience with requirement management process and tools (Jama preferred).
- FMEA, root cause analysis, investigation of service anomalies.
- Understanding of solar industry and mechanical tracking systems.
- Knowledge of applicable renewable energy and electrical codes and standards.

Apply: https://bit.ly/4pTzND5

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Phone : +91 93792 29397
E-mail : amitava.sarkar@informa.com

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website : www.aseancleanenergyexpo.com

START DATE : 25 Mar 2026
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Phone : +86-13539992305
E-mail : manager@grandeurint.com

SOLAR ENERGY EXPO 2026

website : solarenergyexpo.com

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Location : Hanoi, Vietnam
Phone : +86 28 87555888
E-mail : icgea_secretary@163.com

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website : www.aseansolarexpo.com

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website : www.powergen.com

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END DATE : 22 Jan 2026
Location : United States
Phone : +1 774 2474044
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website : www.energy-decentral.com

START DATE : 10 Nov 2026
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Location : Hanover, Germany
Phone : +33 4 67176817
E-mail : m.vagt@dlg.org

SOLARTECH INDONESIA 2026

website : solartech-exhibition.net

START DATE : 22 Apr 2026
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E-mail : info@gem-indonesia.net

THE SMARTER E INDIA CONFERENCE 2026

website : www.intersolar.in

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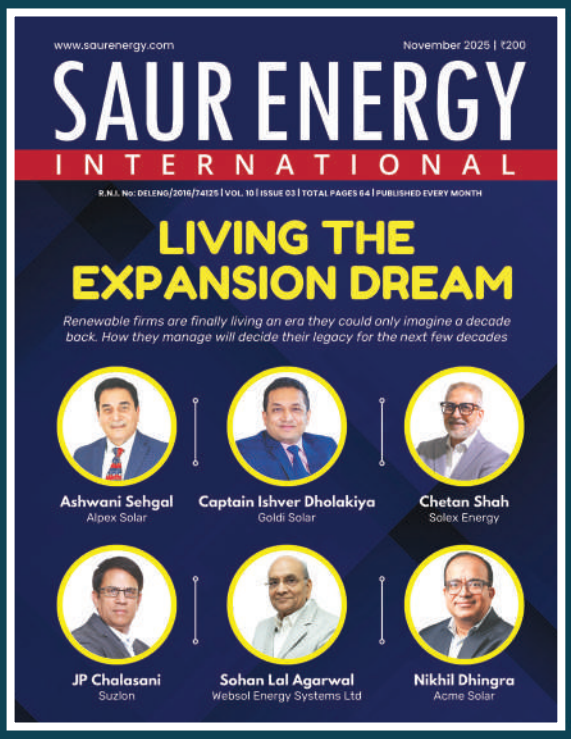

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