

EARTH C NNECT

The Newsletter brings out News , Views , Opinions, Trends , Policy Changes , Technology Advancements and other Developments in the Solar Industry

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SOLAR

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EDITORIAL



Selec: Powering India's Solar Revolution, One Indigenous Inverter at a Time

Innovation Rooted in India

Selec, a pioneer in industrial electronics, is transforming India's solar energy landscape with fully indigenous, world-class inverters. "Made in India" is not just a label — it is a philosophy. Every component, from hardware to firmware, is designed in-house, ensuring global competitiveness while advancing India's self-reliance in renewable energy.

Engineering Excellence for Indian Conditions

Selec's inverters excel in performance, efficiency, and reliability: proprietary algorithms maximize energy output, low startup voltage enables early-morning generation, and superior thermal design maintains performance even in extreme Indian climates. A 3.3 kW inverter paired with 540W TopCon panels can generate up to 22 units daily, among the highest in its class. "Our inverters don't just work — they thrive in India's unique grid conditions," says the team.

Customer Commitment at Every Step

With a network of 180+ engineers nationwide, Selec provides end-to-end service and maintenance, ensuring peace of mind for every user. As demand grows, the company is expanding its footprint to reach more homes and businesses.

Why Indigenous Technology Matters

Indian-made inverters drive self-reliance, offer assured local support, lower maintenance costs, and are optimized for India's grids. "Every time the technology evolves, India evolves with it," emphasizes Selec.

Driving India's Renewable Goals

Selec reduces import dependence, creates jobs, and accelerates solar adoption, supporting initiatives like PM Surya Ghar Muft Bijli Yojana. In under a year, the company has established credibility, expanded manufacturing, and proven that Indian innovation can compete globally.

The Road Ahead

With upcoming 10 kW three-phase inverters, advanced hybrid models, and expanded product ranges, Selec is set to reinforce India's position in global inverter technology. "With every inverter we make, we are powering homes, businesses, and the nation's self-reliant future."

SAMIR KAJI

Managing Director
Selec Controls Pvt. Ltd.

RAJASTHAN SOLAR ASSOCIATION ENGAGES WITH UNION MINISTER SHRI MANOHAR LAL KHATTAR

In a **landmark meeting underscoring India's renewable energy vision**, the Rajasthan Solar Association (RSA) had the honor of engaging with **Hon'ble Union Minister of Power & Housing and Urban Affairs, Shri Manohar Lal Khattar Ji**.

The delegation, led by **Mr. Sunil Bansal, President of RSA**, and comprising **Mr. Nitin Agarwal, CEO**, along with senior members **Mr. Abhinav Mahajan, Mr. Vivek Kudeshia, and Mr. Yogesh Sanklecha**, held an extensive discussion on strengthening the renewable energy ecosystem in Rajasthan and accelerating India's transition to clean power.

The dialogue centered around **policy implementation, investor confidence**, and timely execution of national solar initiatives, with a special focus on challenges Associated with the **Great Indian Bustard projects**. RSA emphasized the need for smoother coordination between stakeholders and government agencies to ensure on-ground progress in project development and financing.

Shri Khattar Ji appreciated RSA's proactive efforts in driving renewable energy growth and assured the delegation of the government's full support toward the association's ongoing and future initiatives. He issued a directive that no coercive action should be taken by any government body in case of project delays related to GIB-linked initiatives—ensuring that industry challenges are addressed with sensitivity and cooperation.

Additionally, the Hon'ble Minister acknowledged the importance of extending the **ISTS (Inter-State Transmission System) waiver** for renewable energy projects to maintain investor interest, cost competitiveness, and sustained momentum in India's clean energy expansion.

The meeting concluded on an optimistic note, with RSA reaffirming its commitment to collaborate closely with the Ministry and all relevant authorities to implement the discussed measures effectively. The association will follow up on developments next Monday to advance these initiatives and ensure tangible progress.

This engagement reflects **the government's continued commitment to fostering a resilient and supportive policy environment** for renewable energy and **RSA's unwavering dedication to advancing Rajasthan's leadership and India's vision for a sustainable, energy-secure future**.



RSA DELEGATION MEETS SHRI SRIKANT NAGULAPALLI, SHRI J.V.N. SUBRAMANYAM & SHRI RAJESH KULHARI TO DISCUSS RENEWABLE ENERGY INITIATIVES

In a key engagement to accelerate India's renewable energy growth, the RSA delegation met with Shri Srikant Nagulapalli, Additional Secretary, Ministry of Power; Shri Rajesh Kulhari, Joint Secretary, Ministry of New and Renewable Energy (MNRE); and Shri J.V.N. Subramanyam, Joint Secretary, Ministry of New and Renewable Energy (MNRE).

The discussions focused on vital policy mechanisms, subsidy implementation, and regulatory measures shaping India's solar and distributed energy landscape. Key topics included the KUSUM subsidy release, distributed deployment models such as ALMM and ALC. RSA also highlighted challenges in on-ground implementation and sought process streamlining for faster adoption.

The delegation further discussed the anti-dumping duty framework, emphasizing the need to safeguard domestic manufacturers while strengthening India's solar manufacturing ecosystem. At the same time, stakeholders emphasize that sustaining India's solar growth requires a balanced approach to dealing with dumping cases. Given global oversupply and falling prices, there is concern that imposing anti-dumping duties may unnecessarily burden Indian developers and solar projects. Policymakers are therefore urged to carefully evaluate price differentials, market impacts, developer margins, and the nation's long-term solar roadmap before deciding on the imposition of duties. RSA put this on the front of the government's attention during the meeting.

"The meeting reaffirmed the Ministries' commitment to supporting distributed solar energy and incentivizing domestic manufacturing," the RSA delegation noted. Both sides agreed to maintain regular dialogue, monitor subsidy disbursements, and enhance industry-policy collaboration—advancing India's journey toward a resilient, self-reliant, and sustainable renewable energy future.



PIONEERING SOLAR INNOVATION: MNRE OFFICIALS VISIT UDAIPUR FLOATING SOLAR PLANT

In a significant step toward sustainable energy innovation, **RSA CEO Mr. Nitin Agarwal** guided MNRE officials — **Shri J.V.N. Subramanyam (Joint Secretary)** and **Smt. Suman Chandra (Director)** — on their inaugural visit to Rajasthan's pioneering **Floating Solar Power Plant in Udaipur**.

Spanning **24 acres on Fatehsagar Lake with a 3.0 MW capacity**, the project showcases advanced floating solar technology that minimizes land use, enhances efficiency, and reduces water evaporation. Featuring high-



efficiency PV modules and a robust anchoring system, it stands as a model of clean energy engineering.

During the visit, Mr. Agarwal highlighted the plant's design, operational performance, and its role in strengthening Rajasthan's solar leadership. The MNRE officials appreciated its innovative monitoring systems and replication potential across India.

This initiative reflects **RSA's commitment to driving innovation, sustainability, and India's clean energy transformation.**

MNRE REINFORCES ALMM MANDATE, ORDERS REISSUE OF SOLAR TENDERS

In a decisive move to safeguard India's renewable energy mission and support domestic manufacturing, the Ministry of New and Renewable Energy (MNRE) has directed the withdrawal and reissue of solar tenders floated in August 2025. The tenders in question had unusually short bidding timelines and were found to be circumventing the Approved List of Models and Manufacturers (ALMM) mandate for solar cells — a key policy mechanism designed to promote transparency and strengthen India's solar supply chain.

Why the Tenders Were Scrapped

According to MNRE's review, the bidding structure raised concerns because it effectively excluded compliance with the ALMM framework. The ALMM, introduced to ensure that only government-approved models and manufacturers of solar modules and cells are used in projects, is central to India's vision of building a resilient renewable energy ecosystem. By bypassing this requirement, the tenders risked undermining the policy's intent of boosting domestic production capacity and ensuring quality standards.

The ministry has now made it clear that any such attempts to dilute the mandate will not be tolerated. The scrapping of these tenders reflects the government's determination to hold both developers and implementing agencies accountable to national solar policy.

A Boost for Domestic Solar Manufacturing

The ALMM policy is seen as a cornerstone of India's Atmanirbhar Bharat (self-reliant India) initiative. It gives preference to locally manufactured solar components, reducing dependence on imports and ensuring that the rapid expansion of renewable energy also supports local industry.

By demanding the reissue of non-compliant tenders, MNRE is sending a strong message that domestic manufacturers must be given fair opportunities to participate in the country's energy transition. This aligns with India's broader goals of reaching 500 GW of non-fossil fuel capacity by 2030 and achieving net zero emissions by 2070.

Industry Reaction

Industry experts and stakeholders have welcomed the move, describing it as a "course correction" that reinforces the credibility of India's solar procurement framework. Some developers expressed concerns that stricter compliance may extend project timelines in the short term, but most agree that the long-term benefits outweigh the initial hurdles.

"MNRE's action will ensure a level playing field and restore confidence in the tendering process," noted a senior industry executive. "It also reassures domestic manufacturers that the government is serious about protecting the integrity of ALMM and supporting local capacity."

The Road Ahead

With the reissue of these tenders, developers are expected to receive adequate bidding timelines, enabling them to structure projects in full compliance with ALMM requirements. This move is likely to bring more predictability and stability to the renewable energy bidding ecosystem.

At a time when India is rapidly scaling up its renewable capacity, such policy reinforcement is vital. It not only prevents shortcuts but also ensures that India's clean energy growth is sustainable, transparent, and domestically anchored.

Conclusion

The MNRE's decision to scrap and reissue solar tenders is more than just an administrative correction; it is a reaffirmation of India's long-term renewable vision. By upholding the ALMM mandate, the ministry has strengthened the foundation for a self-reliant solar industry while ensuring that the country's ambitious green energy targets remain firmly on track.



INDIA LAUNCHES ANTIDUMPING PROBE INTO SOLAR ENCAPSULANT IMPORTS

Investigation Targets South Korea, Thailand, and Vietnam

In a decisive step to safeguard domestic solar manufacturing, the Directorate General of Trade Remedies (DGTR) has initiated an antidumping investigation into imports of solar encapsulants from South Korea, Thailand, and Vietnam. The move follows a petition filed by RenewSys India, which alleged that foreign producers were exporting encapsulants at unfairly low prices, severely undercutting Indian manufacturers.

Scope of the Investigation

- **Product in Focus:** Polyolefin encapsulants, EVA-POE-EVA encapsulants, and ethyl vinyl acetate (EVA).
- **Usage:** These polymer-based materials are critical in solar photovoltaic (PV) modules, ensuring adhesion between layers, cushioning cells, and providing long-term durability.
- **Period of Investigation:** April 1, 2024, to March 31, 2025.
- **Injury Analysis Period:** Financial years 2022, 2023, and 2024.

DGTR said there is prima facie evidence that imports from the subject countries are being dumped at prices significantly below domestic cost levels. It added that the “dumping margin is above the de minimis threshold,” justifying the investigation.

Impact on Indian Manufacturers

According to the complaint, these low-priced imports are eroding domestic prices, leading to:

- Shrinking profit margins for Indian encapsulant makers.
- Lower capacity utilization rates.
- An uneven playing field for domestic suppliers.

The complainant emphasized that there is **no technical difference** between imported encapsulants and those produced locally. Both serve identical functions and end-uses, raising concerns that Indian firms are being displaced despite meeting quality benchmarks.

Trade Policy Context

The investigation reflects a broader trend of **India tightening trade defenses** in the renewable energy sector. In February, the Ministry of Commerce finalized antidumping duties on imports of textured tempered solar glass, a key component in solar module production.

Industry groups have long advocated for **stronger domestic sourcing mandates**, arguing that overdependence on imports—particularly in critical inputs like encapsulants, glass, and backsheets—threatens India’s long-term solar manufacturing ambitions.

Last year, several solar ancillary manufacturers urged the **Ministry of New and Renewable Energy (MNRE)** to require government projects to use domestically produced encapsulants, in line with India’s goal of creating a **self-reliant solar supply chain**.

What Lies Ahead

The DGTR will examine cost structures, production margins, and the landed value of imports before recommending whether to impose **definitive antidumping duties**. If duties are levied, they could range from a few percentage points to steep tariffs, depending on the degree of injury assessed.

Industry stakeholders believe the outcome of this probe could **set a precedent** for future cases involving other solar components. With India targeting **500 GW of renewable capacity by 2030**, ensuring a robust local ecosystem for solar components will be critical to reducing reliance on imports and insulating the sector from global price volatility.



INDIA STRENGTHENS ROOFTOP SOLAR DATA SECURITY WITH DOMESTIC PROTOCOLS, BOOSTING ENERGY SOVEREIGNTY

India has taken a significant step to safeguard telemetry from rooftop solar installations, ensuring that data from home solar systems remains on India-based servers. The Ministry of New and Renewable Energy (MNRE) is implementing a vendor-neutral national data protocol under the PM Surya Ghar program, which aims to cover 10 million homes and 30 GW of rooftop solar capacity. This initiative underscores the country's focus on energy sovereignty, cybersecurity, and long-term resilience of its solar infrastructure. The draft framework specifies how inverter-side devices will authenticate and transmit data to a centralized platform, reducing the risk of cyber threats and unauthorized data flows. The move follows concerns that certain foreign monitoring devices had previously routed data outside India, raising potential security risks.

Standardized Data Communication and RMS Guidelines

Under the draft Remote Monitoring System (RMS) guidelines, each rooftop solar site will deploy a machine-to-machine (M2M) SIM-based communication unit—such as a modem, dongle, or data logger—placed adjacent to the inverter.

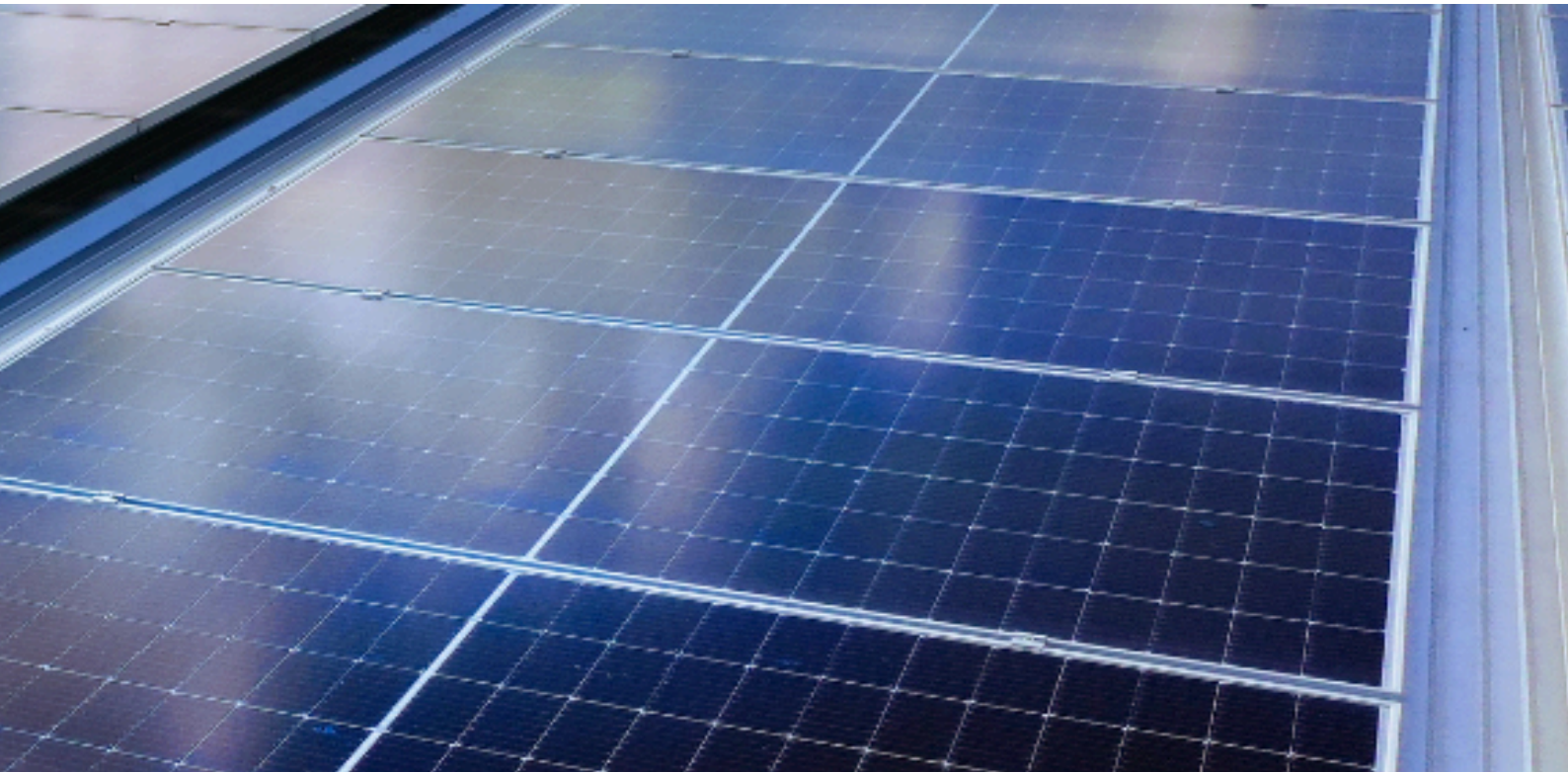
These devices will connect via encrypted channels using digital certificates and IMEI numbers. Data transmission will follow the Message Queuing Telemetry Transport (MQTT) protocol, in compliance with IEC 20922 standards. RMS systems will use store-and-forward buffering, ensuring that data collected during connectivity outages is uploaded once the connection is restored. Lifetime counters maintained by inverters will allow reconstruction of daily energy generation even if some packets are lost.

The technical focus is not only on data security but also on enhancing grid performance. Experts note that many existing inverters do not adhere to reactive power standards, causing voltage fluctuations that can destabilize the grid. Standardized telemetry can improve visibility without overwhelming network bandwidth.

Integration and Testing Process

Integration testing began in September 2025, with original equipment manufacturers (OEMs) connecting devices to the national platform via M2M SIM links. MNRE clarified that for now, one daily submission of generation data, along with historical aggregates, is sufficient, rather than continuous streaming, though this could change in the future.

Manufacturers indicated that communication units will generally be separate from inverters due to heat and voltage fluctuations inside inverters, as well as warranty and consumer choice considerations. String inverters will rely on removable SIM-based dongles, while microinverters may connect via wireless gateways using Zigbee or Wi-Fi.



India-Hosted Servers and Centralized Dashboard

All telemetry will be stored on India-based servers and integrated into a national dashboard, although the final design of the dashboard is still under development. BSNL is being considered as a potential hosting partner. The primary goal is not to redesign hardware, but to standardize and secure data communication. Even a single daily packet from each inverter can significantly enhance grid visibility and reduce voltage fluctuations, supporting more stable and reliable energy delivery.

Consumer Telemetry and Costs

Homeowners will continue to access near real-time energy data through brand apps, with updates every 10 minutes for clarity. B2B customers, such as commercial or industrial users, will have access to both power and energy data for operational monitoring.

Grid Stability and Warranty Implications

Manufacturers emphasized that telemetry is essential not only for data collection but also for grid stability and remote diagnostics. Warranties are increasingly tied to communication capabilities, as firmware updates and issue resolution depend on access to device data.

MNRE's initiative ensures that Indian rooftop solar data remains domestic, while also supporting smarter, safer energy management. Standardized telemetry is expected to improve grid stability, optimize energy distribution, and allow for more effective monitoring and maintenance.

Conclusion

India is setting a new benchmark for rooftop solar data security. The initiative strengthens energy sovereignty, enhances cybersecurity, and provides homeowners and businesses with secure, standardized monitoring. By ensuring that telemetry data remains within India and is transmitted securely, the country is positioning itself as a global example in energy data protection.

As the PM Surya Ghar program scales, these protocols are expected to have a transformative effect on the solar ecosystem, fostering smarter grid management, more resilient infrastructure, and reliable energy production across millions of households.

PRIME MINISTER MODI INAUGURATES 800 MW OF SOLAR PROJECTS, REINFORCES INDIA'S GREEN ENERGY DRIVE

Prime Minister Narendra Modi has given another strong push to India's renewable energy ambitions with the inauguration and foundation laying of three large-scale solar projects in Rajasthan and Andhra Pradesh. Together, these projects add a cumulative capacity of 800 MW, underscoring the government's focus on expanding clean energy infrastructure at record pace.

Three Projects, One Vision

At the ceremony, the Prime Minister inaugurated:

- Sunfree Energy RJP1 (200 MW, Rajasthan): Commissioned by SAEL Group, this project spans over 1,000 acres and is equipped with advanced N-Type TOPCon bifacial solar modules, each delivering peak outputs of up to 635 W and efficiencies approaching 23%. The high-performance modules were manufactured domestically at SAEL's Kishangarh facility, highlighting India's growing solar manufacturing capabilities.
- Alma Solar PV Project (300 MW, Rajasthan): Developed by EDEN Renewables India, this project in Badi Sid, Phalodi, further cements Rajasthan's position as a hub of solar power generation.
- Amara Raja Infra – SECI Solar Project (300 MW, Andhra Pradesh): Located in Sri Sathya Sai district, this project is being developed for the Solar Energy Corporation of India (SECI) under the second phase of the Central Public Sector Undertaking (CPSU) program (Tranche III). Once completed, it will add significant capacity to the central government's renewable portfolio.



Together, these projects represent a significant step toward India's vision of becoming a global leader in solar power generation and achieving 500 GW of non-fossil fuel capacity by 2030.

A September Surge in Renewables

The 800 MW launch follows an even larger wave of renewable energy announcements made by the Prime Minister in September, when he unveiled projects totaling 2,458 MW across the country. Among them were:

- Avaada Energy's 1,560 MW solar + 2,500 MWh battery energy storage system project in Rajasthan, one of the largest integrated solar-storage projects in India.
- Sunstream Green Energy's 140 MW solar project in Maharashtra, expanding solar penetration into diverse states and regions.

These developments highlight India's multi-pronged strategy: scaling up solar power while integrating large-scale battery storage solutions to enhance grid stability and energy security.

Solar Growth at Record Levels

India's solar capacity growth in 2025 has already reached record levels. In the first half of 2025, the country added 18 GW of solar projects, reflecting a 31% increase year-over-year. Large-scale solar dominated installations, contributing nearly 86% of the new capacity, while rooftop solar accounted for 14%.

As of June 2025, solar power represented 24% of India's total installed power capacity and 49% of the total renewable energy capacity. These figures confirm solar energy's position as the driving force behind India's renewable revolution.

A Self-Reliant Green Future

Beyond capacity numbers, the projects reflect a shift toward domestic innovation and self-reliance. The use of high-efficiency Indian-made modules in the Sunfree Energy project is a case in point, aligning with the government's Atmanirbhar Bharat initiative. This not only supports local industry but also reduces reliance on imports, strengthening India's energy security.

The Prime Minister's active involvement in commissioning these projects sends a strong signal of political will at the highest level. It emphasizes that India's energy transition is not just about meeting climate goals, but also about building a future powered by domestic expertise, sustainable growth, and technological resilience.

Conclusion

With the inauguration of 800 MW of solar projects and a nationwide rollout of over 2,400 MW in September alone, India is reinforcing its position as one of the fastest-growing renewable energy markets in the world. The combination of large-scale solar farms, advanced storage systems, and homegrown technology reflects a maturing sector poised to deliver on India's ambitious climate commitments.

The latest developments show that India's solar journey is not slowing down. Instead, it is accelerating with a clear focus: clean energy at scale, backed by self-reliance, innovation, and sustainability.

SECI INVITES BIDS FOR 3.64 MW ROOFTOP SOLAR PROJECTS

The **Solar Energy Corporation of India (SECI)** has invited bids to install **3,640 kW** of grid-connected rooftop solar projects across 11 government institutions in West Bengal, Tamil Nadu, Delhi, Uttar Pradesh, Karnataka, Odisha, and Uttarakhand under **Tranche IV**.

The last date to submit bids is **October 27, 2025**, and bids will be opened on **October 30, 2025**.

Bidders can participate in a minimum of one project or for the entire capacity. Projects will be developed under the **Renewable Energy Service Company (RESCO)** mode.

Successful developers will be responsible for **design, engineering, procurement, construction, testing, commissioning, and grid connectivity**, as well as **operation and maintenance (O&M)** of the systems for the **25-year PPA term**.
The table below provides project-wise details:

Project Details (Tranche IV – Rooftop Solar, 3.64 MW)

Project Name	State/UT	Capacity (kW)	Earnest Money Deposit (₹)	Net Worth (₹ Million)	Working Capital/Line of Credit (₹ Million)
Indian Institute of Engineering Science and Technology, Shibpur	West Bengal	490	441,000	4.41	5.31
National Institute of Technical Teachers Training and Research, Kolkata	West Bengal	280	234,000	2.24	3.29
National Institute of Technical Teachers Training and Research, Chennai	Tamil Nadu	280	234,000	2.24	3.29
Indian Institute of Management, Tiruchirappalli	Tamil Nadu	700	701,650	7.02	9.8
Sardar Vallabhbhai Patel International School of Textiles & Management,	Tamil Nadu	100	83,650	1	1.4
Urban Health, New Delhi	Delhi	190	158,000	1.56	2.26

Project Name	State/UT	Capacity (kW)	Earnest Money Deposit (₹)	Net Worth (₹ Million)	Working Capital/Line of Credit (₹ Million)
Urban Health, New Delhi	Delhi	190	158,000	1.56	2.26
The Rajiv Gandhi National Aviation University, Amethi	Uttar Pradesh	500	500,000	5	7
Central Institute of Indian Languages, Mysuru	Karnataka	250	209,000	2.09	2.93
National Institute of Fashion Technology, Bhubaneswar	Odisha	110	110,132	1.11	1.32
Hemwati Nandan Bahuguna Garhwal University (Chauras Campus)	Uttarakhand	600	743,188	7.34	9.58
Hemwati Nandan Bahuguna Garhwal University (Srinagar Campus)	Uttarakhand	250	232,650	2.33	3.34
Total					3640

Key Bid Conditions

- **Bid Fees:** ₹6,000 (~\$67.61).
- **Service Charges:** ₹1,350/kW (Category A), ₹1,485/kW (Category B).
- **Performance Bank Guarantee (PBG):** ₹3,375/kW (Category A), ₹3,715/kW (Category B).
- **Minimum CUF:** 15% for Category A, 13.5% for Category B.
- **Timeline:** Category A projects must be commissioned within 9 months; Category B projects within **12 months** of PPA signing.
- **Eligibility:** Bidders must have prior experience in grid-connected solar projects.
- **Modules:** Must be sourced from ALMM List-I and List-II.

This tender comes shortly after SECI's recent request for selection to develop **13,043 kW of rooftop solar on government buildings in Puducherry (Tranche V)**, reflecting the agency's steady efforts to expand solar adoption across public institutions

POWERGRID SECURES 4.5 GW RENEWABLE TRANSMISSION PROJECT

In a major boost to India's renewable integration efforts, the Power Grid Corporation of India (POWERGRID) has won PFC Consulting's auction to expand interstate transmission system (ISTS) capacity by 4.5 GW. The project will be anchored at the Mandsaur pooling substation in Madhya Pradesh, a strategic hub for renewable evacuation.

The transmission project must be completed by March 30, 2028, ensuring timely capacity augmentation to handle India's surging renewable energy pipeline.

PROJECT SCOPE AND CAPACITY

THE PROJECT INVOLVES THE EVACUATION OF:

- 2,998 MW of renewable power from the Mandsaur substation
- An additional 1,500 MW comprising:
 - 600 MW from Sprng Energy's project, and
 - 900 MW from NTPC Renewable Energy's project.

POWERGRID MUST UNDERTAKE THE DESIGN AND CONSTRUCTION OF ADVANCED TRANSMISSION SYSTEMS INCLUDING:

- A 400 kV bus section-II with sectionalizer arrangement.
- A 765 kV bus section-II with sectionalizer arrangement.
- A 220 kV bus section-III with sectionalizer arrangement at the Mandsaur pooling substation.
- Augmentation of the substation's transformation capacity to handle additional loads.

INTERCONNECTION REQUIREMENTS

As part of the development, POWERGRID must build dedicated line bays at Mandsaur to integrate projects from multiple developers:

- A 220 kV line bay for Waaree Renewable Technologies' solar project.
- A 400 kV line bay for NTPC Renewable Energy's solar project.
- A 220 kV line bay for JSP Green's wind project.
- A 220 kV line bay for TEQ Green Power's hybrid project.

All bays will be constructed at the Mandsaur pooling station, turning it into a critical node in the region's renewable evacuation network.

RESPONSIBILITIES OF POWERGRID

- The project's scope goes beyond construction and includes:
- Detailed surveys and project reports.
- Project financing and management.
- Compensation for project land.
- Obtaining a wide range of statutory clearances, including environmental, forest, aviation, railway, and telecommunication coordination approvals.

COMPETITIVE AUCTION AND INDUSTRY CONTEXT

The tender was floated in March 2025. While KCC Buildcon and Techno Electric and Engineering Company qualified in the technical bidding round, it was POWERGRID that ultimately secured the mandate.

This latest win strengthens POWERGRID's leadership in renewable transmission development.

- Recently, the company won REC Power Development and Consultancy's (RECPDCL) auction to set up ISTS infrastructure for evacuating 3.7 GW of pumped storage power in Sonbhadra, Uttar Pradesh.
- In August 2025, POWERGRID also received a letter of intent from RECPDCL to develop an ISTS in Karnataka for integrating renewable energy projects.

DRIVING INDIA'S RENEWABLE INTEGRATION

As India accelerates toward its 500 GW non-fossil fuel capacity target by 2030, large-scale transmission projects are becoming critical to ensure renewable power reaches demand centers efficiently. The 4.5 GW Mandsaur project is expected to play a pivotal role in balancing generation across solar, wind, and hybrid projects, while enhancing grid stability.

POWERGRID's expanding portfolio of renewable transmission projects underlines its central role in India's green energy transformation, ensuring that massive capacity additions translate into reliable, grid-ready power.

KERALA INVITES BIDS FOR INTELLIGENT BATTERY STORAGE SYSTEMS TO POWER A SMARTER GRID

The Energy Management Centre (EMC) of Kerala has announced an expression of interest (EoI) to deploy behind-the-meter, intelligent battery energy storage systems (BESS) across residential and commercial establishments in the state. The initiative represents a major step in Kerala's drive toward smarter, more resilient, and technology-driven energy systems.

Bidders must submit their proposals by October 31, 2025, with bid opening scheduled for November 3, 2025. An empanelment fee of ₹10,000 (~\$112.6) is required, and submissions must be made via the Government of Kerala's e-procurement portal.

Pilot Deployments and Technical Trials

Selected bidders will be invited to participate in pilot installations, technical trials, and proof-of-concept programs, enabling Kerala to test a range of battery technologies and deployment models. The focus will be on providers capable of supplying, installing, operating, and maintaining advanced BESS integrated with intelligent inverters and energy management systems (EMS).

To qualify, bidders must demonstrate prior experience in:

- Deploying storage systems for residential and commercial use cases.
- Integrating battery systems with rooftop solar solutions, smart inverters, and EMS platforms.
- Providing long-term operation and maintenance (O&M) support within Kerala.

Residential and Commercial BESS

The program envisions tailored solutions for different user groups:

- **Residential Applications:**
 - o Storage capacity between 3 kWh and 10 kWh, depending on household load profiles and rooftop solar generation.
 - o Must accommodate future capacity upgrades (up to 10 kWh).
 - o Preference for lithium-ion and lithium iron phosphate batteries with 3,000–6,000 life cycles.
 - o Weatherproof, corrosion-resistant enclosures suited for Kerala's humid and monsoon-prone climate.
- **Commercial Applications:**
 - o Storage capacity ranging from 20 kWh to 100 kWh.
 - o High C-rate performance for peak load shaving and critical load support.
 - o Flexibility for indoor and outdoor installations.
 - o Support for parallel configurations to scale with business energy needs.

Smart Inverters and Energy Management Systems

The EoI emphasizes integration with intelligent inverters and EMS platforms:

- Inverters must be bi-directional, support grid-tied and islanded modes, and enable solar charging and net metering. They should allow segregation of critical and non-critical loads, while prioritizing battery discharge based on time-of-day tariffs.
- Energy Management Systems (EMS) must offer advanced features such as:
 - AI-based load forecasting and solar optimization.
 - Real-time monitoring and remote management.
 - Mobile and web-based dashboards for consumers.
- Battery Management Systems (BMS) must include:
 - Monitoring of state-of-charge, health, and thermal conditions.
 - Cell balancing and robust protection against overvoltage, undervoltage, overcurrent, short circuits, and thermal runaway.
 - Integration with EMS to provide alerts for abnormal operating conditions.

Exploring Technology and Business Models

Through this initiative, EMC also aims to assess:

- Battery chemistries and performance metrics of BESS.
- Inverter capabilities and EMS intelligence.
- Advanced features such as remote diagnostics, cybersecurity protections, and mobile app integration.

On the commercial side, the EoI will evaluate financial and ownership models offered by solution providers. These may include:

- Capital expenditure (CapEx) models.
- Operational expenditure (OpEx) / leasing models.
- Battery-as-a-Service (BaaS).
- Public-private partnerships (PPPs).

Policy Backdrop: Kerala's Push for Rooftop Storage

The initiative is aligned with draft regulations from the Kerala State Electricity Regulatory Commission (KSERC), which propose that net metering will only be permitted for rooftop solar systems sized between 3 kW and 5 kW, provided they include storage systems accounting for up to 30% of rooftop capacity.

This regulation underlines Kerala's vision of coupling solar generation with intelligent storage to reduce grid stress, enhance reliability, and make renewable adoption more consumer-friendly.

Toward a Smarter Energy Future

By inviting expressions of interest, EMC is laying the groundwork for a new era of distributed energy management in Kerala. If successful, the program could serve as a blueprint for other Indian states exploring smart, localized energy storage solutions that complement rooftop solar expansion.

With deadlines set for the end of October, the coming months will reveal which technology providers step forward to shape Kerala's future-ready, resilient, and intelligent power ecosystem.

GOVERNMENT CLEARS 4-HOUR, SINGLE-CYCLE BESS OPERATION

INDUSTRY HAILS MOVE AS A GAME-CHANGER FOR RENEWABLE INTEGRATION

In a landmark policy shift aimed at accelerating India's energy storage adoption, the **Ministry of Power** has amended its guidelines to allow **battery energy storage system (BESS) projects** under **viability gap funding (VGF)** to operate not just in two-hour discharge modes but also in **four-hour, single-cycle configurations**.

The original framework mandated a preference for **two-hour discharge duration** with an average of **1.5 cycles per day**. However, the amended rules now give states the flexibility to retain the right to utilize at least **6,300 cycles of BESS operation** during the contract period.

This change, welcomed by both state utilities and storage developers, is expected to significantly improve project economics and asset health while enabling better renewable energy integration.

RAJASTHAN MOVES FIRST WITH 2,000 MWH TENDER

The new mechanism clearly defines how deviations will be calculated:

The guideline revision has already spurred action. Rajasthan Rajya Vidyut Utpadan Nigam (RRVUNL) has opened bidding for a 500 MW/2,000 MWh standalone BESS project designed on the four-hour, one-cycle model.

Ajitabh Sharma, Principal Secretary (Industries), Rajasthan government, noted on social media:

“We already have **4,000 MWh** under implementation on a **two-hour, two-cycle design pattern**. This new **2,000 MWh** tender marks another tranche in a **four-hour, single-cycle model**, providing more flexibility in renewable integration. Together, this completes our **6,000 MWh BESS plan** for Rajasthan.”

Why Four-Hour, Single-Cycle Makes Sense

Industry leaders have highlighted multiple benefits of the revised framework:

- **Flexibility in Operations** – Distribution companies can split a four-hour cycle into partial discharges across different times of the day.
- **Improved Battery Life** – Fewer cycles with longer discharge durations reduce stress on batteries, prolonging their operational life.
- **Grid Resilience** – Extended backup hours enhance grid stability and provide more robust ancillary services.
- **Curtailement Relief** – In solar-rich states like Rajasthan, longer storage windows can absorb excess generation and minimize curtailment losses.

Debmalya Sen, President of the **India Energy Storage Alliance**, said:

“This is a good move. A four-hour, one-cycle operation allows utilities to adapt usage as per demand, while improving overall battery health.”

Kartik Seth, Managing Partner at **Chambers of Kartik Seth**, echoed this view:

“The relaxation enhances commercial viability, ensures asset longevity, and strengthens the flexibility required to integrate higher shares of renewable power.”

Addressing Transmission Bottlenecks

Experts have also pointed out that transmission expansion is lagging behind renewable capacity addition. Since **building transmission corridors takes years**, storage solutions such as BESS can act as an immediate buffer, absorbing solar power during peak hours and releasing it when demand surges.

This makes the new four-hour model especially critical for states with high solar penetration, where congestion and curtailment have become frequent challenges.

Policy Support and VGF Push

The government’s policy shift builds on its broader ambition to accelerate energy storage deployment. In **June 2025**, the Ministry announced the **second tranche of VGF** amounting to **₹1.8 million (~\$21,043)/MWh**, designed to support the development of **30 GWh of BESS capacity** nationwide.

Together with the latest operational flexibility, this is expected to boost investor confidence and help India move closer to its target of deploying **50 GW of BESS by 2030**.

Looking Ahead

The **four-hour, single-cycle model** is set to become a preferred design for upcoming BESS projects, given its ability to balance **economics, performance, and grid reliability**. For solar-rich states like Rajasthan, it could mark the beginning of a new phase in energy storage adoption, ensuring that renewable power is not only generated but also fully utilized.

As one industry expert put it, *“Energy storage is no longer just an add-on—it’s becoming the backbone of India’s clean energy transition.”*

RAJASTHAN CHARTS A NEW COURSE: MANDATORY 5% ENERGY STORAGE FOR GREEN PROJECTS ABOVE 5 MW

State introduces forward-looking policy to balance renewable expansion with grid stability

In a major step toward sustainable energy integration, the Rajasthan Electricity Regulatory Commission (RERC) has proposed a new amendment mandating energy storage systems (ESS) for all new renewable energy projects exceeding 5 MW, excluding hydroelectric plants.

Under the proposed framework, developers must install ESS equivalent to 5% of their renewable capacity, with a minimum of two hours of storage. The policy aims to strengthen grid stability, manage intermittency from renewables, and encourage hybridized clean energy solutions.

Stakeholders have been invited to submit feedback and comments on the draft by September 29, 2025.

Expanding Green Open Access

The proposal also updates Rajasthan's open access regulations to simplify participation in the green energy market. Consumers with a contract demand or sanctioned load of at least 100 kW—either through single or aggregated connections within the same electricity division—will be eligible for open access to renewable energy.

For captive power projects, no lower limit on contracted load applies, expanding flexibility for industries seeking clean energy independence. Applicants must hold valid grid connectivity from either the State Transmission Utility (STU) or the Central Transmission Utility (CTU).

The State Load Dispatch Centre (SLDC) will serve as the nodal agency for short-term green open access applications and registrations, processing them within five working days through the Green Open Access Registry (GOAR) portal. The Regional Load Dispatch Centre (RLDC) will finalize approvals within two additional working days.

Battery Storage and Captive Power Flexibility

The proposed policy also introduces innovative provisions for **behind-the-meter projects** operating under the captive model.

Projects sourcing up to 200% of their contract demand must install battery energy storage systems (BESS) for 20% of the energy generated beyond the contract limit.

Each BESS installation will include separate metering to distinctly record charging and discharging cycles, ensuring transparent energy accounting.

Banking and Scheduling Simplified

To encourage greater renewable utilization, energy banking will be permitted for captive consumption within the state.

Projects generating up to 100% of their contract demand may bank 25% of injected energy or 30% of monthly consumption, whichever is higher—on an annual basis. For projects exceeding the 100% mark and up to 200% of the contract demand, banking of up to 30% of monthly consumption will be allowed per billing cycle.

Scheduling and deviation settlements will follow RERC's Forecasting and Scheduling Regulations (2017). To maintain grid discipline, consumers must adhere to 12 uniform time blocks for drawal and consumption forecasts.

Managing Curtailment and Grid Stability

In situations involving transmission constraints or grid security measures, curtailment priority will follow a structured order—beginning with short-term bilateral transactions, followed by collective transactions, and finally distribution licensee open access. Intrastate transactions will be curtailed before interstate ones.

The new curtailment mechanism seeks to prevent the large-scale renewable energy reductions that recently reached up to 4 GW due to transmission bottlenecks and grid imbalances in the state.

A Step Toward a Smarter Renewable Future

Rajasthan's policy proposal positions the state as a leader in integrating renewable energy with storage, addressing the growing need for reliability in a high-renewable grid. If approved, it will mark a transformative step toward smarter, more resilient clean energy infrastructure—paving the way for India's ambitious energy transition goals.

RSA KNOWLEDGE ADDA

SOLAR INVERTER RMS – THE BRAIN BEHIND SMART SOLAR

Gone are the days of “set and forget” solar systems. Today, Remote Monitoring System (RMS) transforms your solar inverter into a smart, vigilant energy manager. RMS connects your solar setup to the cloud, letting you see, analyze, and optimize your energy performance from anywhere in real time. It’s like having a personal technician watching over your system 24/7.

Why RMS Matters – Benefits That Impress:

- Instant Performance Insights: Monitor each panel, inverter, and battery status with pinpoint accuracy.
- Proactive Problem-Solving: Early alerts on faults, shading, or efficiency drops mean no surprises.
- Maximized Energy Yield: Analytics highlight underperforming panels and suggest fixes, ensuring you harvest every ray of sunlight.
- Remote Control Power: Adjust inverter settings, reset alarms, or fine-tune loads without stepping outside.
- Data-Driven Decisions: Historical reports guide expansions, energy planning, and ROI optimization.

RMS & Safety – A Silent Guardian:

- Fault Detection & Alerts: Immediate notifications prevent overloads, short circuits, and equipment failure.
- Battery & Grid Protection: Continuous monitoring ensures batteries are not overcharged, and the grid interface stays safe.
- Operational Transparency: Know exactly how your system is performing—no guesswork, no downtime.
- Cyber-Safe Operations: Secure encrypted access protects your energy data from tampering.

Bottom Line: RMS makes a solar inverter more than just a power converter—it’s a smart, safe, and efficient energy brain, maximizing output, protecting equipment, and giving you the power of knowledge. A solar system without RMS is like a car without a dashboard—you never truly know what’s happening under the hood!

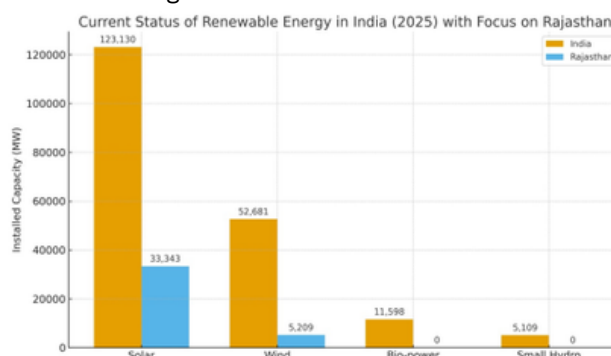
RISING GREEN HORIZONS: INDIA’S RENEWABLE ENERGY LANDSCAPE IN 2025 WITH SPOTLIGHT ON RAJASTHAN

As of 31st August 2025, India has made remarkable strides in renewable energy adoption, underscoring its unwavering commitment to a sustainable energy future. The nation’s total installed renewable energy capacity now stands at 242,625.77 MW, reflecting a well-diversified portfolio of solar, wind, bio-power, and small hydro sources. Solar power leads the charge with 123,130.20 MW, followed by wind energy at 52,681.27 MW, highlighting India’s strategic focus on clean energy deployment. Bio-power, including biomass and waste-to-energy solutions, contributes 11,597.56 MW, while small hydro adds 5,108.71 MW to the national grid.

Turning the spotlight on Rajasthan, the state emerges as a true renewable energy powerhouse, contributing 39,014.41 MW—approximately 16% of India’s total renewable capacity. Rajasthan’s dominance lies in solar energy, with 31,163.29 MW of grid-connected solar installations and 1,980 MW of off-grid solar capacity, making it a pivotal hub for solar generation. Wind power complements the state’s energy mix with 5,208.75 MW, reflecting a steadily diversified renewable portfolio.

Rajasthan’s exceptional solar focus contrasts with India’s broader renewable landscape, which integrates wind, bio-power, and small hydro alongside solar in a more balanced manner. This synergy demonstrates that while Rajasthan leads in solar deployment, other states are driving complementary initiatives in wind and biomass, ensuring a comprehensive multi-source renewable infrastructure nationwide.

In summary, India’s renewable energy sector is on a rapid growth trajectory, with Rajasthan at the forefront of solar innovation. The combination of state-level specialization and national-level diversification positions India to achieve its ambitious clean energy targets while strengthening energy security and promoting environmental sustainability.



RAJASTHAN DISCOMS PUSH FOR VIRTUAL AND GROUP NET METERING TO UNLOCK ROOFTOP SOLAR POTENTIAL

PROPOSAL AIMS TO EMPOWER GOVERNMENT AND RESIDENTIAL CONSUMERS WHILE EASING FINANCIAL PRESSURE ON UTILITIES

In a bid to accelerate rooftop solar adoption and improve financial stability, Rajasthan's three power distribution companies — Jaipur Vidyut Vitran Nigam (JVVNL), Ajmer Vidyut Vitran Nigam (AVVNL), and Jodhpur Vidyut Vitran Nigam (JdVVNL) — have jointly petitioned the Rajasthan Electricity Regulatory Commission (RERC) to permit virtual net metering (VNM) and group net metering (GNM) across the state.

The move seeks to amend the RERC (Grid-Interactive Distributed Renewable Energy Generating Systems) Regulations, 2021, which currently allow for traditional net metering and net billing but not for virtual or group-based mechanisms.

DISCOMs argue that enabling VNM and GNM is essential for implementing utility-led aggregator and RESCO models under the PM Surya Ghar: Muft Bijli Yojana, aligning Rajasthan with states such as Delhi, Odisha, Maharashtra, and Assam, where these mechanisms are already operational.

EXPANDING SOLAR ACCESS THROUGH AGGREGATOR MODELS

The proposed framework would allow both domestic consumers and government institutions to participate in shared solar systems, even when they cannot install rooftop solar on-site.

Rajasthan currently has over 100,000 government electricity connections with a combined sanctioned load exceeding 1.19 GW. However, the sector is burdened by outstanding dues of ₹15.05 billion (~\$179 million) as of May 2025 — a financial strain that has forced DISCOMs to rely on costly borrowings to sustain operations.

By enabling virtual and group metering, the DISCOMs believe solarization of these government connections can significantly reduce grid dependency, lower outstanding bills, and improve DISCOM liquidity. The Rajasthan Renewable Energy Corporation (RREC) has already been designated as the nodal agency to oversee 100% rooftop solar coverage on all government buildings, as per the state order dated February 1, 2024.

PROPOSED FRAMEWORK AND ELIGIBILITY

According to the petition, VNM and GNM will initially be available only to domestic category consumers and government entities.

- For domestic consumers, the sanctioned load cap will be 10 kW per connection.
- Government connections will face no capacity cap, enabling large institutional participation.
- A technical feasibility study will be mandatory for all government projects, while small domestic projects (≤ 10 kW) will remain exempt unless part of a group or virtual setup

Government consumers opting for RESCO-based VNM or GNM would be required to pay 50% of the cross-subsidy surcharge and additional surcharge, along with 100% wheeling charges at the applicable voltage level, until specific LT-level wheeling rates are defined.

STORAGE INCENTIVES TO STRENGTHEN GRID INTEGRATION

The DISCOMs have also proposed wheeling charge waivers to incentivize battery energy storage system (BESS) integration:

- 75% waiver for systems with at least 5% solar capacity supported by BESS.
- Additional 1% waiver for every 1% increase in storage capacity, up to 30%.
- 100% waiver for systems with BESS exceeding 30% of total solar capacity.

This approach is consistent with the Government of India's advisory (February 18, 2025) encouraging storage deployment alongside rooftop solar to enhance reliability and grid flexibility

BALANCING FINANCIAL SUSTAINABILITY AND SOLAR GROWTH

The DISCOMs' proposal aims to strike a balance between incentivizing rooftop solar and safeguarding grid infrastructure costs.

By partially levying surcharges and wheeling fees, utilities can recover network expenses while still offering a viable economic model for consumers.

In the long run, officials believe that government-led solarisation through VNM and GNM will not only offset fiscal liabilities but also lower the state's overall power procurement cost.

Recently, RERC approved JdVVNL's solar tariffs ranging from ₹2.68 to ₹3.66 per kWh for 488 MW of projects under the PM-KUSUM (Component-C) initiative – signaling Rajasthan's growing emphasis on affordable, distributed solar generation

A STEP TOWARD SMARTER, SHARED SOLAR ACCESS

If approved, Rajasthan's inclusion of virtual and group net metering would mark a transformative leap toward inclusive, decentralized clean energy. By bridging technical, financial, and policy gaps, the state could become a national model for utility-led rooftop solar adoption, empowering households and public institutions alike to contribute to a greener, more resilient energy ecosystem.

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