

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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Accelerating India's Solar Journey: From Terawatts to Transformations

Solar Power capacity addition hit a remarkable milestone last year when it crossed 2 Terawatts (TW), as per the Global Solar Council and Solar Power Europe. This milestone has great significance since it took almost 68 years to achieve the installation of 1st terawatt (TW), while the second was added in just 2 years. Putting scale to this massive achievement in context 2 TW of solar is equivalent to the installed capacities of several countries put together. With annual solar installations currently hovering around 500 GW, it's not impossible to achieve a 1 TW installation per annum.

Forward-looking policies, highly automated Industrial scale of manufacturing, millions of entrepreneurs & workers, scalable technologies with requisite funding have brought us to this moment for which we should be proud.

India too started well early on this journey of solarisation, but accelerated its momentum in recent years to reach impressive solar installations of 127 GW, making us amongst top 3 countries in terms of installations. As a country, our record is not only limited to installation but has also taken strides in manufacturing capacities, with installed solar module manufacturing capacity breaching 100 GW. With the right policy intervention, we look for similar growth in the coming years in the entire value chain, making our country truly independent in the Solar Energy sector. Our journey of energy independence is sector-agnostic, and today we see large participation from Utilities, developers, commercial, industrial and even domestic users participating in this revolution. With policy intervention and initiation of schemes like PM KUSUM, PM Muft Bijli Yojna and solar water pumping, our farmers and rural households are getting access to energy at optimum cost

The last decade has also seen tremendous change on the technological front with solar cells from Polycrystalline getting replaced first by Monocrystalline, followed quickly by Mono PERC, Half cut, Bi-facial and eventually to TOPCON Bi-facial. We see this momentum of rapid disruptions to continue in the coming years, getting a makeover with TOPCON with back contacts and Tandems with Perovskite to improve efficiency beyond the physical limitations of Silicon crystalline technology barriers. We also saw quite a lot of innovation happening on Balance of system components, starting with Solar modules now operating at 1500 V DC, the arrival of large capacity String Inverters, which not only helped with modularity but also with installation time. Establishment of single-axis trackers on utility-scale projects is upping the yield and making faster returns on investment.

Overall, we can see it's one of the most happening industries with loads of innovations happening regularly and will continue to grow for decades to come.

Chirag Nakrani

MD

Rayzon Solar

POWERING PROGRESS: RAJASTHAN'S C&I SECTOR LEADS THE ROOFTOP SOLAR REVOLUTION

BUSINESSES SHIFT TO SOLAR FOR SURVIVAL, NOT JUST SUSTAINABILITY

In the heart of India's solar capital, Rajasthan's commercial and industrial (C&I) sector is undergoing a quiet energy revolution. Rooftop solar is no longer just an eco-conscious decision—it's becoming a critical economic strategy for energy-intensive industries fighting steep electricity costs.

With abundant sunlight, progressive state policies, and increasing awareness, Rajasthan's C&I units are tapping into rooftop solar to slash power bills, strengthen energy independence, and align with India's Renewable Energy Mission (REM). From cost-cutting to climate action, solar is emerging as a cornerstone of business resilience.

A well-designed rooftop system under the CAPEX model can offer a payback period of just 3 to 5 years. Beyond that, it's virtually free electricity for the next 15–20 years.



WHY THE SHIFT NOW?

Electricity expenses in industrial operations can account for up to 40% of total operating costs. This figure is no longer sustainable for many businesses, particularly in energy-intensive sectors such as Manufacturing, textiles, and ceramics—prominent industries in Rajasthan.

Enter rooftop solar. With tariffs from DISCOMs hovering around ₹8–₹10 per unit, and rooftop solar delivering power at ₹3–₹3.5 per unit under the CAPEX model, the savings are too significant to ignore.

Tech Meets Terrain: Building Smart Solar Systems

While Rajasthan's sunny skies provide a natural advantage, installing rooftop solar is not a plug-and-play process. Key considerations before installation include:

- Load pattern analysis
- Age and structural strength of the building
- Proper Earthing and safety infrastructure

Even seemingly minor issues—like rooftop shading—can cut generation by 30% to 40%. That's why expert engineering, procurement, and construction (EPC) partners are crucial to the success of any solar project.

Selecting the right inverter is also vital. Inverters directly influence performance and ROI. Matching inverter specifications to the load profile ensures optimal efficiency and output.

SIZING SOLAR RIGHT: POLICY AND PRACTICALITY

Rajasthan's net metering policy currently allows C&I consumers to **Bank up to 1 MW** of power per month—making accurate system sizing essential. Oversized systems may not bring proportional returns if excess energy cannot be effectively banked or sold back to the grid.

For a typical **1 MW rooftop solar system**, costs range from **₹35 million to ₹45 million**, generating **1.2 to 1.7 million units** annually under ideal conditions. That's a serious dent in power bills—and carbon emissions.

However, building condition also affects costs. If a building's structure is weak, it may add **4–5% to the project cost**. Add-ons like **Battery storage**, hybrid inverters, and quality cabling also influence final pricing.



STORAGE: THE NEXT FRONTIER

As solar adoption accelerates, many large industries are also integrating Battery Energy Storage Systems (BESS). BESS provides critical backup during grid outages and reduces dependence on diesel generators—especially important in remote or outage-prone regions. Designing the battery system around real load profiles ensures reliable performance. With the right hybrid setup, solar plus storage ensures Round-the-clock power, improved reliability, and further cost savings.

LOOKING AHEAD: A MODEL FOR INDIA'S CLEAN ENERGY FUTURE

Rajasthan's rooftop solar success is more than a regional story—it's a blueprint for India's industrial energy transition. As the REM 2030 targets loom closer, decentralized, clean energy solutions like rooftop solar will become the backbone of sustainable industry.

With upfront costs falling and technology maturing, solar power is not just about going green—it's about staying competitive. The sun-drenched rooftops of Rajasthan are now silent engines of industrial growth—delivering not just power, but promise.

EMPOWERING THE MARGINS: MAHARASHTRA'S SMART ROOFTOP SOLAR REVOLUTION

A Transformative step toward inclusive energy access for over 800,000 Households

07

In a landmark move toward inclusive energy access, the Government of Maharashtra has launched the **Self-Reliant Maharashtra Residential Rooftop (SMART) solar program** — a bold initiative targeting low-income and economically marginalized households with highly subsidized solar power systems.

This flagship initiative comes at a time when energy prices and climate resilience are at the forefront of both policy and public concern. With a vision to democratize access to clean, reliable, and affordable Electricity, SMART could become a model for energy justice in India.

₹2,500 FOR A BRIGHTER FUTURE

Under the SMART program, households **Below the poverty line (BPL)** will receive a **1 kW rooftop solar system** by contributing just **₹2,500 (~\$28)**. The remaining cost, estimated at ₹50,000 per system, will be absorbed through a combination of **35% state and 60% central government subsidies**.

This structure not only reduces the upfront burden but also makes clean energy accessible for families that need it the most — providing them with **long-term relief from power bills** and greater energy independence.

BEYOND BPL: WIDER SUBSIDY COVERAGE

The program extends beyond BPL households, targeting **Scheduled Caste (SC), Scheduled Tribe (ST), and general category households** that consume less than **100 units of electricity per month**.

SUBSIDY STRUCTURE HIGHLIGHTS INCLUDE:

- **30% State subsidy** for SC/ST households (₹15,000)
- **20% State subsidy** for general low-consumption households (₹10,000)
- **60% Central subsidy** (₹30,000) for all eligible categories

Consumer contributions under these categories range from ₹5,000 to ₹10,000, depending on their eligibility.

BUDGET AND IMPLEMENTATION

With a total financial outlay of ₹6.55 billion (~\$74 million), SMART is being implemented in two phases:

₹3.30 Billion allocated for FY 2025–26

₹3.25 Billion allocated for FY 2026–27

The program is managed by the state electricity department, with **Maharashtra State Electricity Board (MSEB)** acting as the nodal agency responsible for implementation, quality control, and fund disbursement.

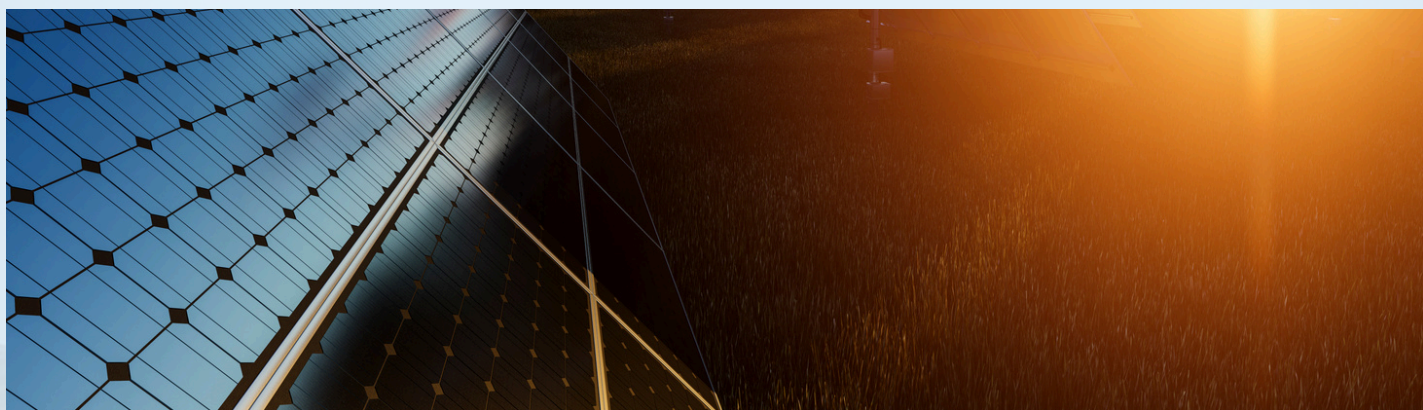
TECHNICAL OVERSIGHT AND ACCOUNTABILITY

Each selected household will receive a 1 kW solar rooftop system, post site verification for technical feasibility. Installations will follow strict technical standards, including:

- **Radio-frequency identification (RFID)** tags on modules for tracking
- **Five-year operation and maintenance** obligation by installers
- **No prior subsidy** condition to ensure equitable distribution

Households must be connected to the grid and registered on the **National rooftop solar portal**. Eligibility is also restricted to those consuming **less than 100 units/month** between October 2024 and September 2025.

To ensure robust governance, all project activities — from tendering and inspections to fund disbursal — will be audited quarterly, with detailed reports submitted to the state.



REACHING THE UNREACHED: FOCUS ON REMOTE REGIONS

TSMART goes beyond urban centers by targeting underserved and geographically challenging areas such as **Melghat, Nandurbar, and Gadchiroli** — regions often overlooked in mainstream infrastructure development.

SUBSIDY STRUCTURE HIGHLIGHTS INCLUDE:

By doing so, the program not only promises energy access, but also addresses the rural-urban divide in renewable energy adoption, supporting local economies and improving the quality of life.



AMBITIOUS TARGETS UNDER NATIONAL MISSION

As part of India's broader PM Surya Ghar: Muft Bijli Yojana, which aims to provide 300 free electricity units monthly to 10 million households, Maharashtra has set a target to empower 875,000 households through rooftop solar by 2027.

Of these, 154,622 BPL households are expected to be covered by December 2025. If the BPL target isn't fully met, the remaining quota will be filled by other eligible low-consumption households, ensuring flexibility in execution.

A NEW ENERGY PARADIGM FOR INDIA

TSMART goes beyond urban centers by targeting underserved and geographically challenging areas such as Melghat, Nandurbar, and Gadchiroli — regions often overlooked in mainstream infrastructure development.

By enabling the poorest citizens to generate their own power, this initiative does more than install solar panels — it installs dignity, independence, and opportunity.

If successfully executed, SMART has the potential to serve as a national benchmark for inclusive solar adoption, demonstrating how clean energy can power not just homes, but a more just and self-reliant future.

QUICK FACTS:

SMART Rooftop Solar Program

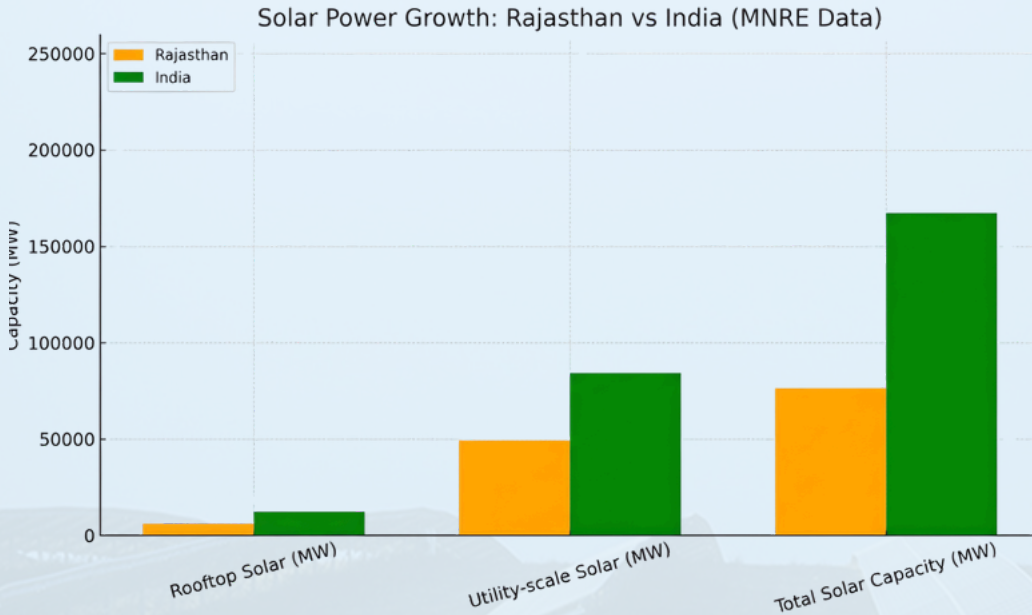
- **BPL HOUSEHOLDS PAY ONLY ₹2,500 FOR A 1 KW SYSTEM**
- **SUBSIDIES: 60% (CENTRAL) + 20–35% (STATE)**
- **ELIGIBILITY: HOUSEHOLDS CONSUMING <100 UNITS/MONTH**
- **TOTAL BUDGET: ₹6.55 BILLION (~\$74 MILLION)**
- **IMPLEMENTATION AGENCY: MSEB**
- **TARGET BY DEC 2025: 154,622 BPL HOUSEHOLDS**
- **STATEWIDE TARGET: 875,000 HOUSEHOLDS**





Rajasthan continues to cement its position as a national leader in solar energy, contributing substantially to India’s growing renewable energy landscape. According to the latest data from the Ministry of New and Renewable Energy (MNRE), Rajasthan has installed 1,805.9 MW of rooftop solar (including PM-Surya Ghar Yojana) and 34,555.87 MW of utility-scale solar power, totaling 40,406.99 MW of solar capacity.

When compared to the national scenario, India has achieved a total solar capacity of 247,309.63 MW, with 21,522.65 MW from rooftop solar and 127,332.29 MW from utility-scale solar. Rajasthan’s contribution, though just one of the states, represents a remarkable 16.35% of India’s total rooftop solar and 27.12% of its utility-scale solar capacity, underscoring the state’s strategic role in driving the country’s renewable energy goals



The state’s consistent focus on policy support, large-scale solar parks, and citizen-centric rooftop programs like PM-Surya Ghar Yojana has created an ecosystem where solar adoption thrives. This remarkable growth positions Rajasthan not just as a solar powerhouse, but as a benchmark for other Indian states striving to accelerate their renewable energy transitions

With continued investments and policy backing, Rajasthan is on track to further enhance its solar footprint, supporting India’s journey toward achieving its ambitious clean energy targets and sustainable development goals.

RSA KNOWLEDGE ADDA

BESS – POWERING THE FUTURE OF ENERGY

“WHY WE ARE CHARGING AHEAD”

In a world rapidly transitioning to renewable energy, Battery Energy Storage Systems (BESS) have emerged as a true game-changer. BESS are being deployed globally to:

- **Stabilize the Grid** – Mitigate the intermittency of solar and wind power.
- **Shift Peak Loads** – Optimize energy consumption and reduce peak demand costs.
- **Secure Energy Supply** – Ensure uninterrupted power even during grid outages.
- **Maximize Renewable Use** – Store surplus energy for use when the sun doesn’t shine.

“With BESS, we’re not just storing energy; we’re storing the future.”

“Inside the BESS: Tech That Powers Progress”

Parameter	Standard / Feature	Key Advantage
Battery Type	Li-ion (LFP / NMC)	Safe, efficient, long-lasting
Voltage	400 – 1000 V DC	Scalable for utility projects
Capacity	100 kWh – 50+ MWh	From commercial to MW-scale
Round-trip Efficiency	85–95%	Minimal energy loss
Depth of Discharge (DoD)	80–95%	More usable energy per cycle
Cycle Life	4000 – 10000 cycles	Ensures strong ROI
Operating Temperature	-10°C to 50°C	Suited for India’s climate
Response Time	<1 sec	Instant frequency regulation
Integration	SCADA & IoT-ready	Smart monitoring & analytics
Safety	BMS, thermal & fire control	IEC & UL compliant

“Benefits That Matter”

BESS Deployment is not just a technical upgrade—it’s a strategic move. Here’s why:

- **Financial Gains** – Lower electricity bills through time-of-use optimization.
- **Grid Support** – Frequency regulation, reactive power, and voltage stabilization.
- **Sustainability** – Reduce carbon emissions by maximizing renewable integration.
- **Business Continuity** – Backup energy ensures uninterrupted operations.
- **Future-Ready** – Aligns with national and state energy storage policies.

Adoption and Growth: 2024–2025

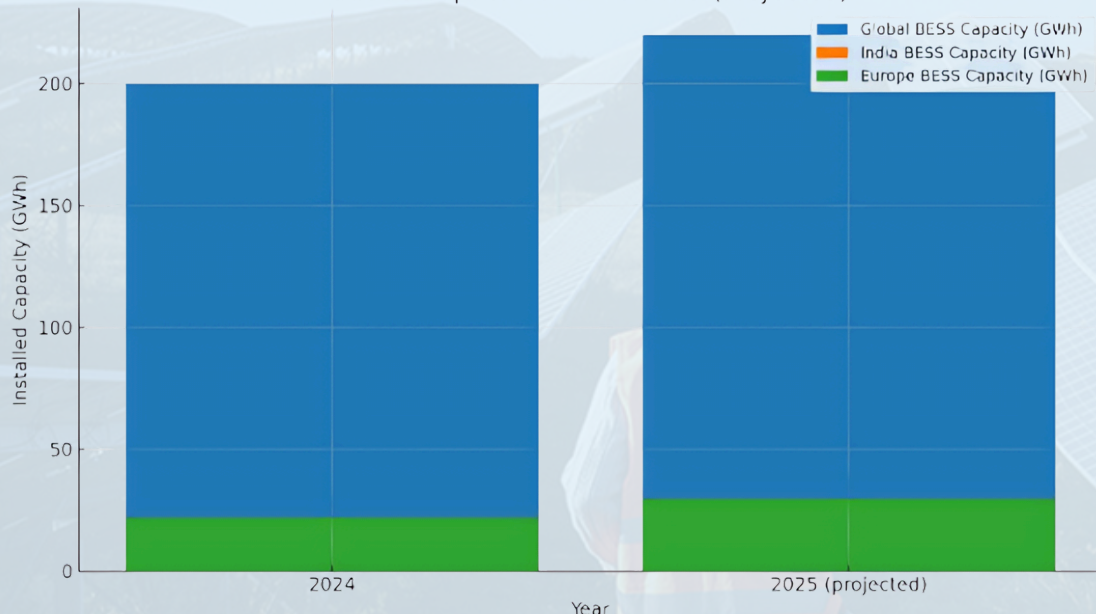
2024 Highlights:

- **53% increase** – Rho Motion reports global BESS Deployments surged by 53% in 2024, exceeding 200 GWh of installed capacity.
- **Growth in GWh** –over 175 GWh added globally, with expectations to exceed 220 GWh in 2025.
- **Increased GW Capacity** – IRENA reports 74 GW of battery storage added worldwide in 2024, nearly double 2023’s capacity additions.
- **Record Year for Europe** – Europe installed 21.9 GWh, marking its eleventh consecutive record-breaking year, though annual growth slowed to 15%.

2025 Projected Growth:

- **Steady Global Expansion** – Saur Energy projects over 220 GWh of new capacity globally, driven by tendered BESS projects.
- **India’s Rapid Increase** – The Indian market is expected to add 1.8 GWh in 2025; in H1 2025, India allocated 7.6 GW to developers —the highest BESS allocation ever.
- **Europe Re-accelerating** – Following a residential-driven slowdown in 2024, Europe is expected to grow 36% in 2025, led by the utility-scale segment.
- **Strong CAGR Forecast** – Research and Markets projects BESS market growth from \$68.7 billion in 2025 to \$289.25 billion by 2032, at a CAGR of 22.7%.

BESS Adoption: 2024 vs 2025 (Projected)



“Rolling Out the Future”

The global BESS deployment strategy is simple yet powerful:

- **Modular & Scalable** – From 100 kWh to multi-MWh systems.
- **Hybrid Integration** – Coupled with solar PV and wind for seamless hybrid operation.
- **Smart Dispatch** – AI-driven algorithms optimize charging and discharging.
- **Maintenance Ease** – Remote monitoring and predictive maintenance reduce downtime.

INDIA'S SOLAR SECTOR SURGES: ALMM CAPACITY ADDS 6.9 GW AMID REGULATORY BOOSTS AND MAJOR INVESTMENTS

The Ministry of New and Renewable Energy (MNRE) has updated the Approved List of Models and Manufacturers (ALMM) for solar Modules, adding a remarkable 6,922 MW in October 2025. This pushes the cumulative ALMM capacity to **116,467 MW**, reflecting India's accelerating transition towards Renewable energy.

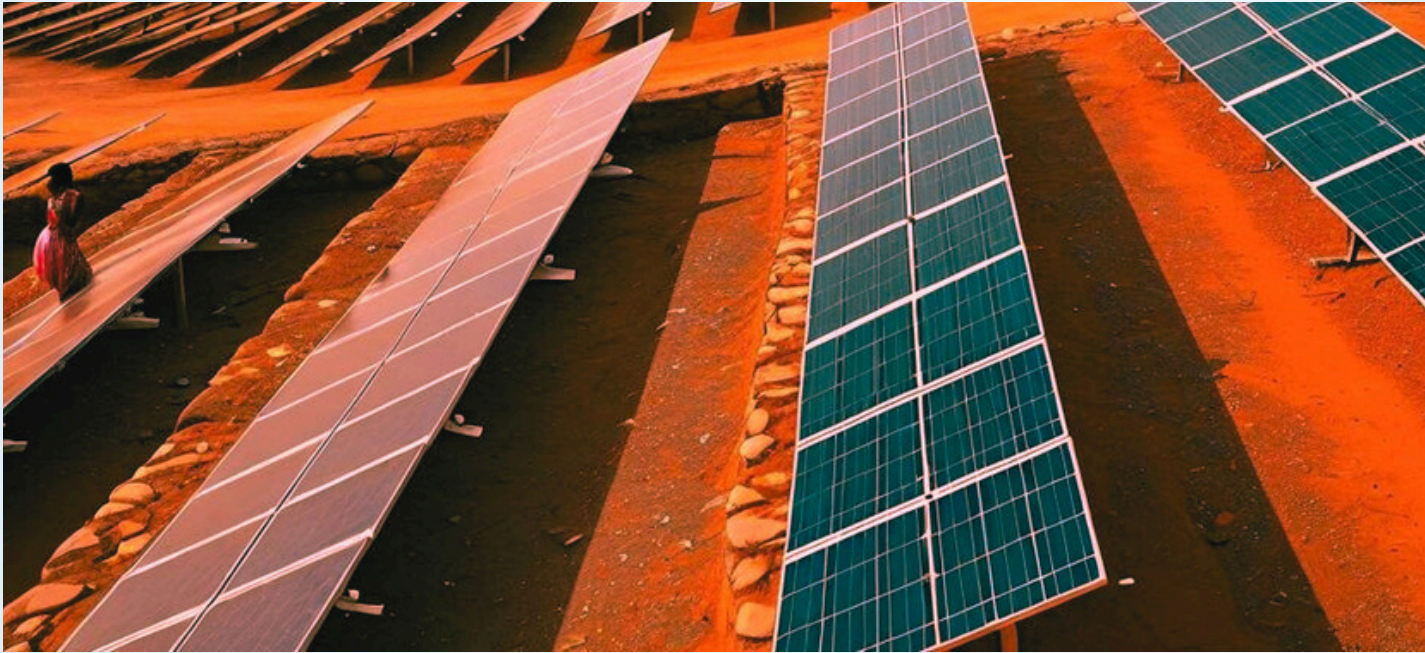
Among the notable contributors, **Gautam Solar** expanded its capacity by 2,372 MW to reach 3,224 MW, while **Bluebird Solar** grew by 713 MW to 819 MW. **Goldi Sun** and **Rayzon Solar** added 610 MW and 400 MW respectively, and **Jakson Engineers** and **Emmvee Energy** increased their capacities to 1,209 MW and 3,276 MW.

In regulatory developments, the Rajasthan electricity regulator has permitted **virtual and group net metering**, opening the door for consumers to install distributed renewable energy projects from 1 kW up to 1 MW. The amendment includes codified charge waivers and **Btery storage incentives**, following a petition by Jaipur Vidyut Vitran Nigam.

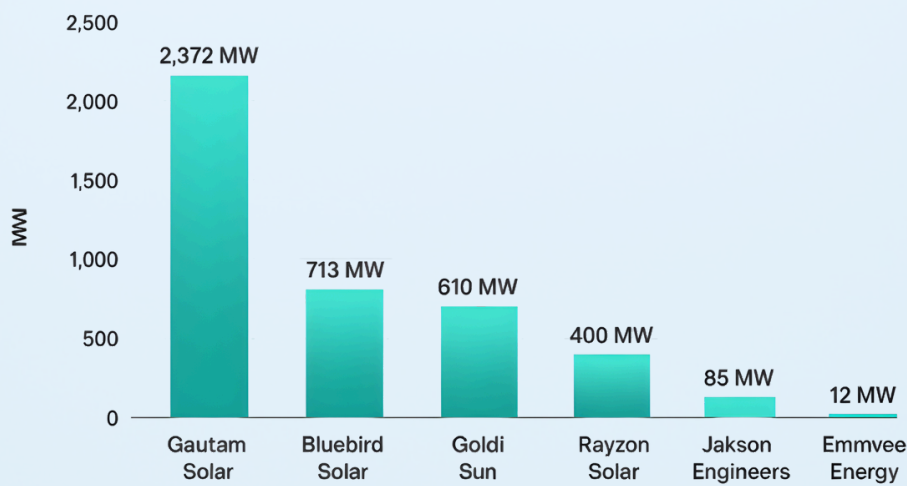
Meanwhile, the **Ministry of Railways** has invited bids for 1,733 kW grid-connected rooftop solar projects across service and residential buildings in Guwahati, Assam. With an expected cost of ₹106.85 million (~\$1.2 million), the projects include modules ranging from 10 kW to 500 kW, with bids closing on **October 28, 2025**.

In Gujarat, **Bridge and Roof Company** has issued an EPC tender for a **600 MW interstate transmission system (ISTS)-connected solar project** at NTPC Renewable Energy Khavda Park-South Block. Bids close on **October 27**, with the project covering the complete BoS package and three years of operation and maintenance.

Corporate solar players are reporting robust growth. **Waaree Renewable Technologies** recorded **₹7.75 billion (~\$87.37 million)** in Q2 FY26 revenue, a **47.73% YoY** increase, with EBITDA surging **120.69%** to **₹1.58 billion (~\$17.81 million)**, reflecting strong operational performance.



ALMM Solar Capacity Additions by Company (October 2025)



Solex Energy, a Gujarat-based module manufacturer, secured a **₹5.44 billion (~\$61.33 million)** order from Spain’s Zelestra Group for N-Type TOPCon 615/620Wp glass-to-glass solar modules. The fully automated 4 GW facility at Tadkeshwar, Surat, will fulfill the order in phases by February and November 2026.

Government-backed lender **IREDA** reported **₹20.57 billion (~\$239.2 million)** in Q2 FY26 revenue, driven by a 31% expansion in its loan book to ₹844.77 billion (~\$9.82 billion). Profit after tax rose to ₹5.49 billion (~\$63.8 million), up from ₹3.88 billion (~\$45.1 million) YoY.

On the investment front, **EIB Global** is committing up to **\$60 million** to the India Energy Transition Fund, targeting a \$300 million fund to support greenfield infrastructure projects and growth-stage companies. The fund aims to accelerate private capital flows into renewable energy, energy efficiency, battery storage, electric vehicles, and circular economy initiatives such as recycling and wastewater management.

India’s solar and renewable energy sector is clearly scaling new heights, driven by regulatory support, corporate investments, and international financing, setting the stage for a sustainable and resilient energy future.



RAJASTHAN SETS NATIONAL BENCHMARK IN BESS DEPLOYMENT

1 GW / 2 GWh Tender Cleared at Record-Low ₹1.775 Lakh/MW/Month Rajasthan has again proven its leadership in India’s clean energy transition. Rajya Vidyut Utpadan Nigam Ltd (RVUNL) has finalized India’s most competitive tariff yet for standalone Battery Energy Storage Systems (BESS) under the Government of India’s Second VGF Scheme.

The tender achieved an all-time low price of **₹1.775 lakh/MW/month**, registering a **15% cost reduction** from RVUNL’s previous BESS auction. This milestone comes despite a stable global cost environment and includes tighter parameters:

- **₹9 lakh/MWh lower VGF support** Mitigate the intermittency of solar and wind power.
- **₹9 lakh/MWh lower VGF support**
- **220 kV grid connectivity** mandated

A total of 11 companies secured project awards, demonstrating rising industry confidence in large-scale energy storage growth in Rajasthan.

TENDER RESULTS – WINNING BIDDERS

Name	Tariff	Capacity Won
1. Stockwell Solar	₹1.775 lakh/MW/Month	200 MW / 400 MWh
2. Oswal Cables	₹1.775 lakh/MW/Month	100 MW / 200 MWh
3. Micromax Informatics	₹1.775 lakh/MW/Month	50 MW / 100 MWh
4. Patanjali Renewables	₹1.775 lakh/MW/Month	100 MW / 200 MWh
5. RCRS Innovations	₹1.775 lakh/MW/Month	50 MW / 100 MWh
6. Viviana Power Tech	₹1.78 lakh/MW/Month	100 MW / 200 MWh
7. Galaxy Mining & Royalties	₹1.78 lakh/MW/Month	100 MW / 200 MWh
8. Manda Projects	₹1.78 lakh/MW/Month	100 MW / 200 MWh
9. Mineralia Impex	₹1.78 lakh/MW/Month	50 MW / 100 MWh
10. Onward Solar	₹1.785 lakh/MW/Month	100 MW / 200 MWh
11. ST Electricals	₹1.785 lakh/MW/Month	50 MW / 100 MWh

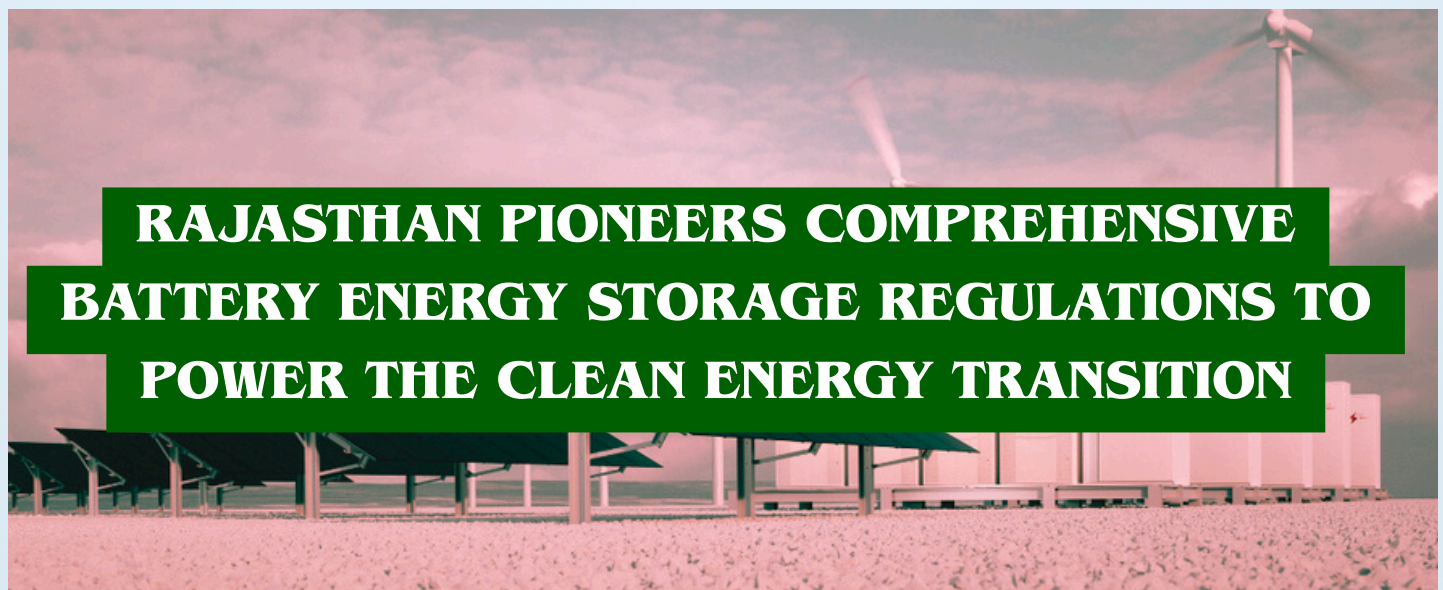
WHAT THIS MEANS FOR THE SECTOR

- 133 Developers in India now hold standalone BESS portfolios
- Rajasthan leads the build-out of over 48 GWh BESS capacity Nationwide
- Faster progress toward Round-the-Clock Renewable Power
- The focus now shifts from awards to Speedy Execution that will secure India's energy independence and grid resilience.

RSA VIEWPOINT

Rajasthan has positioned itself as India's powerhouse for energy storage. The falling tariffs signal strong investor confidence and technological maturity, setting a benchmark for future tenders across the country.

RSA will continue to track implementation progress and ensure that Rajasthan remains the front-runner in the clean energy revolution.



In a landmark move, the Rajasthan Electricity Regulatory Commission (RERC) has released Draft regulations to establish a robust framework for the deployment, operation, and utilization of **Battery Energy Storage Systems (BESS)** across the state. The draft regulations aim to accelerate energy storage adoption, enhance grid flexibility, and enable innovative applications such as energy arbitrage and **Behind-the-meter storage**. Stakeholders are invited to submit suggestions and objections by **November 14, 2025**.

TECHNOLOGY-NEUTRAL AND INCLUSIVE APPROACH

The draft BESS regulations are designed to be **Technology-neutral**, applying to all systems that meet prescribed technical and performance standards. A wide range of entities—including distribution and transmission licensees, generation companies, independent power producers, renewable energy developers, aggregators, and third-party investors—can develop and operate BESS projects of at least **1 MW with a minimum 2-hour backup**. Smaller-scale projects, such as behind-the-meter installations or distribution transformer-level storage, are exempt from this minimum sizing requirement.

VERSATILE DEPLOYMENT MODELS

BESS can be Deployed in multiple configurations:

- Co-located with renewable or conventional power projects
- Grid-connected standalone systems
- Embedded in transmission or distribution networks
- Behind-the-meter at consumer premises
- Integrated with electric vehicle infrastructure for vehicle-to-grid services

Consumers can utilize storage for self-consumption or sell power back to DISCOMs during peak hours, with potential incentives through **tariff-based mechanisms**. Aggregation of BESS resources from multiple sites to provide grid services is also permitted, expanding flexibility and operational efficiency.

EMPOWERING DISCOMS AND CONSUMERS

The regulations clearly define the roles of licensees:

- DISCOMs and the State Transmission Utility will **Plan storage requirements, in consultation with the State Load Dispatch Center (SLDC)**.
- Licensees can recover BESS costs through annual revenue requirements.
- Behind-the-meter storage projects can now be registered via **SLDC's online portal** without prior permission, allowing consumers to actively participate in demand response and grid services.



BOOSTING RENEWABLE INTEGRATION AND GRID SERVICES

BESS will play a key role in enabling renewable integration, providing ancillary services, and supporting vehicle-to-grid programs. The SLDC will monitor performance parameters such as **state of charge, round-trip efficiency, and availability**. Eligible BESS providers can participate in energy markets and ancillary service programs, making Rajasthan a model for **smart energy storage adoption**.

With these regulations, Rajasthan is positioning itself as a **front-runner in energy storage and renewable energy integration**, creating opportunities for developers, consumers, and licensees alike while paving the way for a **cleaner, more resilient power grid**.



WEST BENGAL POWERS AHEAD: 250 MW/1,000 MWH STANDALONE BATTERY STORAGE TENDER ANNOUNCED

In a significant stride toward energy security and grid modernization, **West Bengal State Electricity Distribution Company Limited (WBSEDCL)** has invited bids for the development of **250 MW / 1,000 MWh standalone Battery Energy Storage Systems (BESS)** at the Goaltore substation in Paschim Midnapore. The initiative also includes a **Greenshoe option** for an additional **250 MW / 1,000 MWh**, reflecting the state's long-term commitment to energy transition and renewable integration.

The **Deadline for Bid submission is November 14, 2025**, with bid opening scheduled on the same day — setting the stage for one of India's most strategic energy storage procurements this year.

A BLUEPRINT FOR ENERGY RELIABILITY

The proposed BESS will be connected at the **132 kV bus** of WBSEDCL's Goaltore substation. The system is expected to ensure **4 hours of continuous discharge** at rated power, guaranteeing flexibility and reliability in balancing renewable intermittency.

Developers must ensure a **minimum 90% round-trip AC-to-AC efficiency** on a monthly basis — a benchmark aligning with international standards of large-scale storage systems. Only **commercially Proven and operational technologies** will be permitted, ensuring both reliability and speed of execution.

CONTRACT AND COMMISSIONING FRAMEWORK

The selected developer will enter into a **15-year Battery Energy Storage Purchase Agreement (BESPA)**, ensuring operational and commercial stability. The project must be commissioned **within 18 months** of signing the BESPA, setting a clear implementation timeline for early deployment.

Planned maintenance will be allowed with prior notice of one month, limited to **34 hours in any two-Month Period**, ensuring minimal downtime. Moreover, the system must be capable of **full operational readiness within one hour between charging cycles**, reinforcing its role in grid responsiveness.

INVESTMENT AND PARTICIPATION CRITERIA

Bidders are required to submit a Bid Processing fee of ₹500,000 plus applicable GST, and demonstrate a Minimum annual turnover of ₹5 million (~\$56,000) per MWh during the last completed financial year – a move aimed at attracting serious and financially sound developers.

The Deadline for Bid submission is November 14, 2025, with bid opening scheduled on the same day – setting the stage for one of India's most strategic energy storage procurements this year.

STRATEGIC CONTEXT AND MARKET TRENDS

The West Bengal initiative is part of India's broader vision to scale up energy storage capacity and stabilize the renewable-heavy grid. Earlier in 2025, CESC (Calcutta Electric Supply Corporation) floated a tender for a 40 MW / 80 MWh standalone BESS in Kolkata under a Build-Own-Operate-Transfer (BOOT) model, marking the beginning of a new wave of energy storage infrastructure in eastern India.

However, Despite policy momentum, the Energy storage sector in India witnessed a temporary slowdown. The country added only 48.4 MWh of energy storage capacity in the first half of 2025, representing a 74% Decline from the 186 MWh added during the same period last year. This tender, therefore, comes at a pivotal time, signaling a potential rebound and renewed government focus on grid stability through battery storage.



THE ROAD AHEAD

With renewable penetration rising sharply, West Bengal's 250 MW BESS project represents more than just capacity addition – it is a **foundation stone for flexible, Dispatchable clean power**. Once operational, the project will support peak load management, renewable firming, and frequency regulation – paving the way for a **Resilient, low-carbon power ecosystem** in eastern India.

CERC REDEFINES INDIA'S GRID ACCESS FUTURE

Amendment to Connectivity and GNA Regulations 2025 Ushers in a New Era of Flexibility, Transparency, and Renewable Integration.

In a landmark move poised to reshape the contours of India's power transmission and renewable integration framework, the Central Electricity Regulatory Commission (CERC) has notified the Connectivity and General Network Access (GNA) to the Interstate Transmission System (Third Amendment) Regulations, 2025.

This critical amendment refines the operational, procedural, and financial architecture for accessing the Interstate Transmission System (ISTS) – ensuring that India's energy transition is both technically robust and future-ready.

A STRONGER FRAMEWORK FOR CONNECTIVITY

The amendment redefines the concept of a “cluster of ISTS substations”, grouping one or more substations based on geographical proximity, technical feasibility, and planning optimization. This clustering approach will streamline infrastructure development, improve network planning, and reduce redundancy – an essential reform for an increasingly renewable-heavy grid.

Equally significant is the formal recognition of a “connectivity grantee”, providing legal clarity to entities that have secured a final connectivity grant and signed a Category-1 connection agreement. This move strengthens regulatory certainty for developers and investors alike.

SYNCHRONIZING WITH THE SUN: SOLAR AND NON-SOLAR HOUR ACCESS

In a first for India's regulatory landscape, CERC has introduced “solar” and “non-solar” hour access – scheduling blocks designed to mirror the dynamic generation profile of renewable energy.

The National Load Despatch Centre (NLDC) will now declare solar hours weekly, based on regional insolation forecasts, while non-solar hours will cover the remaining day blocks.

- **Solar Hour Access** allows injection during solar hours for the quantum granted and drawal rights throughout the day.
- **Non-Solar Hour Access** provides injection rights during non-solar hours with round-the-clock drawal flexibility.

This differentiation enables better grid balancing, forecasting, and renewable energy utilization, while minimizing curtailment risks for developers.

FINANCIAL DISCIPLINE AND BANK GUARANTEE REFORMS

To discourage speculative applications and ensure only serious participants enter the fray, the amendment tightens norms for bank guarantees.

- Applications withdrawn before in-principle approval will face penalties on **Conn-BG1**, while withdrawals post-final approval will invite a **15% Penalty** along with forfeiture of the application fee and **Conn-BG1 encashment**.
- **Conn-BG2** and **Conn-BG3** provisions have been streamlined to align with project readiness, cost of augmentation, and substation capacity.

These measures are designed to **Protect transmission capacity from speculative blocking**, ensuring that available grid infrastructure is utilized efficiently and equitably.

EMPOWERING SMALL AND RENEWABLE PROJECTS

A particularly progressive step is the inclusion of the **Bhakra Beas Management Board (BBMB)** system within the ISTS framework. Renewable energy generators and energy storage systems ranging from 5 MW to 50 MW can now apply for connectivity through the BBMB network – a move that will empower small developers and accelerate decentralized renewable growth.

Projects below 5 MW can apply directly to the State Load Despatch Centre (SLDC), simplifying access for smaller entities. The framework also ensures **clear timelines for system studies, approvals, and scheduling**, to avoid procedural delays.

FLEXIBILITY FOR HYBRID AND ADDITIONAL CAPACITY PROJECTS

Recognizing the growing importance of hybrid energy systems, the amendment lays down differentiated rules for **solar, wind, and hybrid projects**. Developers can now apply for **non-solar hour access** or **full-day access** depending on their generation mix.

Existing connectivity grantees have also been given the **freedom to add generation or storage capacity within their granted quantum**, without the need for network augmentation – provided they maintain compliance with grid codes and efficiency limits.

This provision ensures **optimized asset utilization** while offering flexibility for developers to integrate **Battery energy storage systems (BESS)** or additional renewable units seamlessly.

RATIONALIZED FINANCIAL AND LAND REQUIREMENTS

To simplify project planning and equity participation, CERC has rationalized **Financial thresholds and land Documentation**.

- For substations below 132 kV, **Conn-BG2** has been standardized at **₹10 million (~\$112,670)**.
- Land requirements and project cost benchmarks will now be periodically published by the **Central Transmission Utility (CTU)** in consultation with the **Central Electricity Authority (CEA)**.

Developers are permitted **one-time land change Requests**, ensuring flexibility in execution while maintaining compliance and transparency.

COMPLIANCE, MONITORING, AND REALLOCATION

The amendment strengthens institutional oversight by mandating **Category-1 and Category-2 Agreements** for all connectivity grantees within fixed timelines. Non-compliance can lead to **Revocation and forfeiture of guarantees**.

Regional Load Despatch Centres (RLDCs) and the NLDC will monitor **Connectivity utilization and grid access efficiency**, submitting **quarterly Reports** to CERC. Additionally, **vacant terminal bays** due to withdrawn or revoked connectivity will be **Reallocated within the same substation cluster**, ensuring optimal infrastructure usage and minimal idle capacity



A DEFINING STEP TOWARD INDIA'S RENEWABLE FUTURE

The Connectivity and GNA Amendment 2025 stands as a forward-looking regulatory blueprint that aligns India's transmission architecture with the realities of renewable generation.

By promoting **Transparency, discipline, and flexibility**, it empowers both large-scale and small renewable players to contribute effectively to India's clean energy ambitions. More importantly, it reinforces a critical principle — **that the future of power is not just about generation, but intelligent, equitable, and efficient access**.

UTTARAKHAND REDUCES OPEN ACCESS SURCHARGE, EASING COSTS FOR LARGE CONSUMERS

In a significant move for industrial and commercial energy users, the Uttarakhand Electricity Regulatory Commission (UERC) has reduced the additional surcharge for open access consumers to ₹1.09/kWh for the period October 1, 2025, to March 31, 2026, down from ₹1.12/kWh last year. The adjustment reflects a careful review of stranded costs and ensures a balanced approach between utilities and open access consumers.

RATIONALE BEHIND THE SURCHARGE

UERC allowed the Uttarakhand Power Corporation Limited (UPCL) to recover stranded fixed costs that arose when large consumers opted for open access power purchases instead of drawing from the distribution network. UPCL reported that during October 2024 to March 2025, about 125.99 million units (MU) of energy went unused due to open access drawal, despite the utility maintaining long-term contracts with six interstate generating stations, including Jhajjar Aravali, Dadri Gas, and FG Unchahar.

TRANSPARENT AND FAIR COMPUTATION

After an independent review, UERC confirmed that the weighted average fixed cost at the consumer end works out to ₹1.09/kWh, taking into account transmission and distribution losses. The total stranded cost was computed at ₹121.5 million (~\$1.37 million), ensuring that the surcharge fairly recovers costs without placing undue burden on consumers. The levy will apply uniformly across all voltage levels, maintaining regulatory consistency.

STAKEHOLDER ENGAGEMENT AND RESOLUTION

Several industrial consumers had questioned the validity of the surcharge for high-voltage connections and challenged the attribution of stranded costs. UERC reviewed the objections, citing prior orders and regulatory provisions, and confirmed that all open access consumers are liable under the current framework.

A BALANCED STEP FORWARD

This adjustment not only reduces the cost burden for large energy users but also provides clarity and stability in the open access framework. By ensuring utilities recover legitimate fixed costs while protecting consumer interests, Uttarakhand is strengthening the path toward efficient, transparent, and market-driven energy procurement.

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