

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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EDITORIAL



Renewable Energy in Rajasthan: Building the Backbone for India's 500 GW Vision

By Prateek Agrawal, Vice President, Rajasthan Solar Association

As India pushes toward its ambitious 500 GW non-fossil fuel target, Rajasthan stands out as a leading force in solar energy deployment. With high solar irradiation, abundant land, and progressive policy support, the state is uniquely positioned to lead the next phase of the clean energy revolution.

Programs like PM-KUSUM have already demonstrated how decentralised solar can empower farmers and rural communities. Rajasthan, with one of the highest uptakes of this scheme, is not only reducing diesel reliance but also enabling farmers to become power producers. At Solar91, we're proud to be part of this transformation, having already commissioned 48 MW under PM KUSUM, with another 109.29 MW in progress—a total of 157.36 MW dedicated to energizing India's agricultural backbone.

Time to Prioritize Grid and Land Reforms

We are now at a stage where grid integration is no longer a support function—it is a strategic enabler. Large-scale generation in remote solar zones demands investment in 132 kV and 220 kV transmission lines, smart metering, and storage-backed dispatch systems.

Just as critical is land acquisition. Current procedures often delay implementation, despite available barren land. Rajasthan should consider introducing a single-window clearance system and easement-style land policies specific to renewable energy to avoid bottlenecks.

Skilling for the Future

Equally, Rajasthan must focus on its future workforce. The green transition will falter without specialized training institutes. We need diploma and degree programs that focus on solar design, EV-grid interfacing, battery O&M, and smart monitoring systems—creating a pipeline of local talent ready to serve a rapidly evolving sector.

A National Responsibility

While Rajasthan plays a pivotal role, the responsibility lies with every state and stakeholder. To meet our national targets, India needs a unified push—policy reforms, infrastructure upgrades, innovation incentives, and human capital development—across the board. The renewable energy sector has the potential to reshape our economy and environment alike, but only if we build not just projects, but a resilient ecosystem to support them.

The sun shines on all of us—now it's time we rise together to harness it.

—Prateek Agrawal
Managing Director , Solar 91

SUNSHINE SAVINGS: DELHI POWERS HOMES WITH ₹30,000 EXTRA FOR ROOFTOP SOLAR

Total Subsidy Now ₹1.08 Lakh for 3kW Systems Under PM Surya Ghar Yojana

Delhi takes a bold leap towards a greener, solar-powered future!

In a landmark move to accelerate solar adoption, the Delhi Government has approved an additional ₹30,000 subsidy for rooftop solar installations up to 3kW capacity. This is over and above the ₹78,000 central subsidy under the PM Surya Ghar: Muft Bijli Yojana, making the total support ₹1,08,000 per household.

Key Highlights:

- **Total Subsidy:** ₹1.08 lakh (~\$1,267.92) for 3kW rooftop systems
- **Monthly Savings:** ₹4,200 (~\$49.31) on electricity bills
- **Objective:** Break the cost barrier & expand solar adoption
- **Target:** 6,000 MW solar capacity by 2027, with 25% share in total consumption

Why This Matters?

1. Delhi's visionary policy is aimed at:
2. Making solar energy affordable for all
3. Reducing household electricity bills drastically
4. Lowering pollution through cleaner energy alternatives
5. Promoting self-reliance in electricity generation

Did You Know?

Delhi offers free electricity up to 200 units/month.

Now, with rooftop solar + government subsidy, citizens can enjoy zero bills and earn from surplus power!

Ease of Installation:

- No More Red Tape
- No application fees
- No registration charges for rooftop systems up to 10kW
- Simplified approvals under DERC's new reforms

Your Rooftop. Your Power Plant.
Delhi's Solar Dream is Real. Be the Spark.

Gujarat Sets New Benchmark in Battery Storage: Tariffs Fall by 39% in Landmark 500 MW BESS Approval



GERC CLEARS RECORD-LOW TARIFFS FROM GUVNL'S PHASE IV AUCTION, SETTING A NEW PRECEDENT IN INDIA'S ENERGY STORAGE MARKET

In a major leap for India's clean energy transition, the Gujarat Electricity Regulatory Commission (GERC) has approved tariff rates for 500 MW/1,000 MWh of standalone Battery Energy Storage Systems (BESS) as proposed by Gujarat Urja Vikas Nigam Ltd (GUVNL) under its Phase IV auction.

What makes this approval historic is the discovered tariff range of

₹225,985 to ₹226,000/MW/month (~\$2,680.57 to \$2,680.74)—a remarkable 39% drop from previous BESS tenders, showcasing an unprecedented level of competition and market maturity.

Winners of the Auction

Out of fifteen participants, four companies emerged successful through the e-reverse auction:

H.G. Infra Engineering - 250 MW at ₹225,985/MW/month

Kintech Synergy - 100 MW at ₹225,985/MW/month

Bhilwara Energy - 100 MW at ₹225,993/MW/month

Advait Infratech - 50 MW at ₹226,000/MW/month

All bidders accepted the tariffs without objection, indicating consensus and stability in pricing.

Regulator's Perspective

The Commission acknowledged that the wide publicity and transparent reverse bidding mechanism contributed to effective price discovery. However, GUVNL drew criticism for delays in submitting load flow studies and technical compliance reports, especially around substation location justification.

Although the documentation was incomplete, the urgency to meet energy storage targets led GERC to approve the tariffs with a strong warning. The Commission emphasized adherence to the Electricity (Late Payment Surcharge) Rules, 2022 and directed full public disclosure of tariff details.

Looking Ahead

With this approval, Gujarat not only strengthens its position as a leader in energy storage innovation, but also sets a national benchmark for future BESS projects. This milestone reflects how strategic policy, competitive bidding, and industry readiness can drive down costs and accelerate project deployment.

India's energy storage ambitions just received a big boost. But for this momentum to continue, regulators expect transparency, timeliness, and compliance—not just competitive tariffs

Powering the Future: ⚡ Adani Electricity Mumbai Unveils Mega 500 MW Energy Storage Tender

AEML invites bids for energy storage projects with a 40-year contract window — paving the way for India's long-duration storage future

In a landmark step toward energy reliability and grid stability, Adani Electricity Mumbai Limited (AEML) has floated a significant tender to procure 500 MW / 4,000 MWh of energy storage capacity, with an optional greenshoe provision of 250 MW / 2,000 MWh. The call for proposals targets pumped hydro storage projects (PSPs) and battery energy storage systems (BESS) to support long-duration power discharge — up to 8 hours daily, including a 5-hour continuous peak support window.

Key Dates:

Bid Submission Deadline: July 1, 2025

Bid Opening Date: July 8, 2025

Financial Requirements:

Document Fee: ₹10,000 (~\$116)

Processing Fee: ₹300,000 (~\$3,503)

Earnest Money Deposit: ₹500,000 (~\$5,838) per MW

Developers must deliver the project on a Build-Own-Operate-Maintain (BOOM) basis, encompassing full project lifecycle responsibilities from design and financing to O&M.

Eligibility Criteria:

- ü Minimum 50 MW per project
- ü Open to projects that are operational, under construction, or yet to be commissioned (with surplus capacity)

- ü Only commercially proven technologies accepted
- ü PSP bidders must demonstrate prior experience in thermal/hydro generation, renewable energy, or EPC in critical infrastructure (e.g., metros, dams, tunnels) with project costs of ₹20 million/MW
- ü Financial turnover of ₹10 million/MW in the preceding fiscal year



Technical Requirements:

- Cycle loss not exceeding 25% over the contract term
- Roundtrip efficiency $\geq 75\%$
- Minimum availability: 90% annually

This tender strengthens Adani Electricity Mumbai's position as a national leader in distribution efficiency, following its top rank in FY 2024 with a score of 99.8 and a net energy sale of 9,813 million units.

AEML's latest tender is not just about megawatts—it's a vision for sustainable, flexible, and future-ready energy infrastructure that aligns with India's evolving power needs.

KERALA POWERS AHEAD: 30% TARIFF SLASH FOR EV CHARGING DURING SOLAR HOURS – A GREEN REVOLUTION ON WHEELS

State Promotes Solar-Powered Mobility with Innovative Time-of-Day Tariff and Smart Energy Banking

In a landmark move to promote clean mobility and solar energy utilization, the Kerala State Electricity Regulatory Commission (KSERC) has approved a Time-of-Day (ToD) Tariff for Electric Vehicle (EV) charging stations. This tariff incentivizes EV users to charge during solar hours (9 AM to 4 PM) by slashing the cost by 30% compared to the regular rate.

This initiative not only makes EV charging more affordable but also encourages smarter energy usage by aligning demand with peak solar generation.

Key Tariff Details:

- **Solar Hours Tariff:** 30% lower than the ruling tariff (i.e., 0.7 times the average)
- **Non-Solar Hours Tariff:** 30% higher than the ruling tariff (i.e., 1.3 times the average)

Fixed/Demand Charges: Waived off for EV charging stations

Energy Banking & Smart Adjustments:

Net-Metering Enabled:

- Surplus energy exported during solar hours can offset imported energy during non-solar hours
- **Conversion Factor Applied:** 13 solar units = 7 non-solar units
- No additional charges for cross-time adjustment

Energy Banking:

- Surplus energy can be carried forward till March 31
- Banked energy can offset future consumption at a 5% banking charge + grid support fee

For EV Charging Stations with Solar Systems:

- **Freedom to Add Storage:** EV charging stations may install Battery Energy Storage Systems (BESS) to store surplus solar power
- **Export Surplus Benefits:** Unused solar energy may be settled at the pooled power purchase cost or as per Commission guidelines

Policy Support: The Ministry of Power has already de-licensed EV charging operations. Any entity can now set up a charging station without a special license, boosting private investment and infrastructure growth in the sector.

Conclusion: Kerala's decision is a game-changer for the electric mobility ecosystem. By combining solar incentives, smart banking, and open infrastructure, the state is paving the way for a greener, more affordable future for EV users

Delhi's EV Policy 2.0: A Carbon Credit Revolution for Green Mobility

As part of India's broader vision for sustainable urban transport, Delhi has emerged as a frontrunner by introducing innovative policy mechanisms to drive electric vehicle (EV) adoption. The Draft EV Policy 2.0, launched after the success of the 2020 policy, marks a bold step forward—this time by integrating carbon credit incentives directly for EV owners. This ties environmental performance with tangible economic benefits.

Progress So Far: What the 2020 EV Policy Achieved

Delhi's initial EV policy (2020) created a supportive environment through:

- Financial subsidies for EV purchases
- Scrappage incentives for old ICE vehicles
- Expansion of charging infrastructure
- Clear adoption targets across vehicle categories (2-wheelers, autos, freight, and buses)

Impact: EV sales rose steadily between FY 2023–FY 2025, showing increasing public acceptance and maturing market interest. However, growth slightly moderated in FY 2025, possibly due to buyers waiting for the updated policy benefits.

EV Policy 2.0: The Carbon Credit Opportunity

The new policy introduces carbon credits as a financial incentive—essentially rewarding EV buyers for reducing greenhouse gas emissions.

How It Works:

- Conventional vehicles emit ~2.7 tonnes of CO₂ annually
- EVs emit about 1.73 tonnes CO₂ annually
- Therefore, using an EV avoids ~0.97 tonnes of CO₂ emissions per year

This avoided CO₂ is translated into carbon credits.

Carbon Credit Breakdown:

- 1 tonne of CO₂ avoided = 1 carbon credit
- Value per credit (in India): INR 100 to INR 800
- Delhi proposes an average incentive value of INR 300 per credit

So, a typical EV user (15,000 km/year) would earn about:

- INR 300 per year in incentives
- And over the lifecycle of the vehicle (approx. 8–10 years), a reduction of 11.65 tonnes of CO₂

Who Benefits the Most?**1. Fleet Operators:**

- Logistics firms, cab aggregators, and delivery companies have high daily mileage
- They generate more carbon savings, so earn higher carbon credit returns

2. Corporates with Net-Zero Goals:

- Businesses looking to offset emissions can use these credits
- Either to meet internal climate targets or trade them for monetary value

Challenges Ahead:**Robust MRV (Measurement, Reporting & Verification):**

Need for accurate tracking of CO₂ emissions and credit validation across various vehicle types and energy sources.

Low Awareness:

General public and small businesses might not understand carbon markets or how to claim credits.

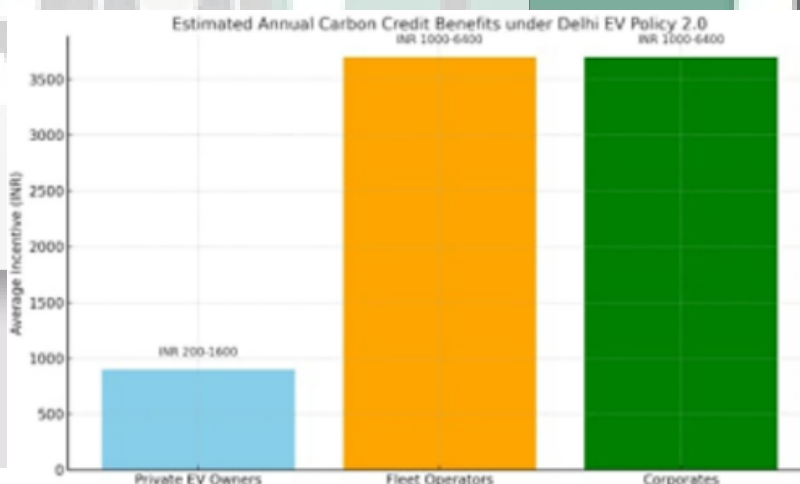
Integration with National Carbon Market:

Delhi must ensure alignment with India's upcoming National Carbon Trading Scheme for seamless implementation.

The Way Forward:

This innovative use of carbon credits places Delhi on the global map for climate-smart mobility. If implemented effectively, it can:

- Accelerate EV penetration
- Improve air quality
- Create economic value from environmental impact
- Empower both individual EV owners and fleet-based businesses

Visual Insight: Carbon Credit Calculation Process

Solar Power Revolution: Reliance, Jindal, and Others Secure Major Wins in SJVN's 1.2 GW Solar Plus Storage Auction

Leading Indian energy companies emerge victorious in India's largest renewable energy auction.

In a highly competitive auction, major companies Reliance NU Energies, Jindal India Renewable Energy, Sembcorp Green, JBM Renewables, Fastnote Biofuels (Hindustan Power), and SAEL have won SJVN's 1.2 GW solar power projects auction, which includes 600 MW of energy storage.

Auction Details:

- **Auction Period:** September 2024
- **Total Capacity:** 1,200 MW solar power projects with 600 MW/2,400 MWh energy storage
- **Eligibility:** Ongoing projects, projects that are yet to be commissioned, or projects selling power on a short-term merchant basis (that are not part of any state or central programs)
- **Technology Agnostic:** Bidders can use crystalline silicon, thin-film, or concentrated photovoltaic technology, with or without trackers.
- **Project Capacity:** Bidders could offer between 50 MW and 600 MW in a single bid.

Winners and Tariffs:

ü Reliance NU Energies: 350 MW (out of 600 MW) at ₹3.33 (~\$0.0390)/kWh
ü Jindal India Renewable Energy: 150 MW at ₹3.32 (~\$0.0389)/kWh
ü Sembcorp Green: 300 MW at ₹3.32 (~\$0.0389)/kWh

ü JBM Renewables: 150 MW at ₹3.32 (~\$0.0389)/kWh

ü Fastnote Biofuels: 100 MW at ₹3.33 (~\$0.0390)/kWh

ü SAEL Industry: 150 MW at ₹3.32 (~\$0.0389)/kWh

Key Highlights:

These projects will be connected to the Interstate Transmission System, contributing significantly to India's green energy infrastructure.

All winning bidders are required to use commercially established and operational technologies to minimize technology risks and ensure successful project commissioning.

Energy storage integration was a key feature of this auction, with the winning projects using 2,400 MWh energy storage to ensure grid stability and energy reliability.

New Directions:

The key agencies behind this growth are NTPC, NHPC, SECI, and SJVN, who together issued 77% of solar tenders in Q1 2025, helping to meet the 50 GW annual target for FY25.

The Central Electricity Authority has mandated that all future solar tenders must include a co-located energy storage system equivalent to 10% of the installed solar capacity for enhanced grid stability.

RSA KNOWLEDGE ADDA

“SURAKSHA SHAKTI – SOLAR SAFETY UNPLUGGED”

Tagline: Engineering Safety into Every Solar Circuit



Suraksha Shakti” is a knowledge hotspot that dives deep into the often overlooked yet critically important world of electrical safety in solar plants. From home rooftops to utility-scale solar parks, this adda aims to build awareness, spread expert knowledge, and share real-world safety insights—focusing on MCBs, fuses, SPD, MPPTs, grounding, isolators, and more.

This section will empower technicians, EPC players, safety officers, and even prosumers with the right knowledge to avoid hazards, improve performance, and ensure longevity.

Section 1 :

SHOCKSHIELD - KNOW YOUR PROTECTION DEVICES

1. MCB (Miniature Circuit Breaker)

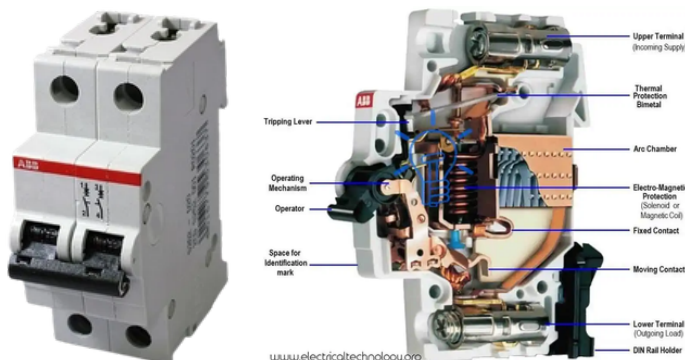
- Function: Provides protection against overload and short-circuit conditions.
- Types Used in Solar: DC-rated MCBs on the string side, AC-rated MCBs at inverter output.

Selection Rating:

- DC Side: $I_{n} = 1.25 \times I_{sc}$ of the string
- AC Side: Match to inverter rated output current with 25% margin
- Standard Reference: IEC 60947-2, IS/IEC 60898-2

2. Fuse

- Function: One-time protection against overcurrent in DC circuits.
- Rated Breaking Capacity (I_{cu}): Must be higher than fault current (typically >10 kA).
- Commonly Used: 15A, 20A fuses for 1000V/1500V DC strings
- Standard Reference: IEC 60269-6 (DC fuse-links)



3. SPD (Surge Protection Device)

- Function: Diverts voltage spikes due to lightning or switching surges.
- DC Side: Type II SPD, voltage rating matching system (e.g., 1000V or 1500V DC)
- AC Side: Type II SPD, typically rated for 230/400V AC systems
- Discharge Current Ratings:
 - I_n (Nominal): 20 kA
 - I_{max} (Max): 40 kA (8/20 μ s waveform)
- Standards: IEC 61643-11

Section 2 :

MPPT - SAFETY BY DESIGN

Function: MPPT tracks the voltage-current (V-I) sweet spot to maximize power.

Safety Risk:

- Overvoltage from string mismatch
- Arc flash due to connector mismatch or improper fusing

Design Safety Tip:

- Use multiple MPPT channels to isolate faults.
- Limit each MPPT to ≤ 2 strings for better control and current balancing.

String Input Voltage Limits:

MPPT Input: 600V, 1000V, or 1500V DC depending on inverter model

String Voltage Calculation: $V_{oc-array} \leq V_{max} \text{ MPPT (adjusted for } -10^\circ\text{C lowest temp)}$

FACT CHECK: GREEN ENERGY OPEN ACCESS (GEOA) IN RAJASTHAN – A SILENT REVOLUTION IN CLEAN POWER ACCESS

As the sun-bathed state of Rajasthan marches towards becoming India's renewable energy capital, a silent revolution is unfolding—Green Energy Open Access (GEOA). Often overlooked in the mainstream, this progressive regulation by the Rajasthan Electricity Regulatory Commission (RERC) is transforming how businesses and institutions interact with green power.

Here's a fact-checked spotlight on the game-changing provisions of GEOA and why this could be the most investor-friendly, future-ready policy Rajasthan has seen in years.

What is GEOA and Who Can Use It?



Fact Check: GEOA isn't just for large corporations.

- Any consumer with 100 kW load or more, including those with multiple connections in the same distribution division, is eligible.
- Captive users? No load limit at all.
- Even co-operatives and societies can pool their demand to qualify.

From MSMEs to data centers and green hydrogen developers, GEOA opens doors for all.

Banking, Billing, and Beyond – The Key Provisions

Monthly accounting, flexibility to choose solar or non-solar, and banking of surplus energy are just the start. But here's the real kicker:

- If you're a RE-based captive consumer, you can size your plant up to 200% of your contract demand, provided you add a Battery Energy Storage System (BESS) for 20% of that extra energy.
- Green Hydrogen plants? Get full support to draw 100% green power, with policy-aligned capacity sizing.



Dealing with Deviations – Energy Accounting Explained

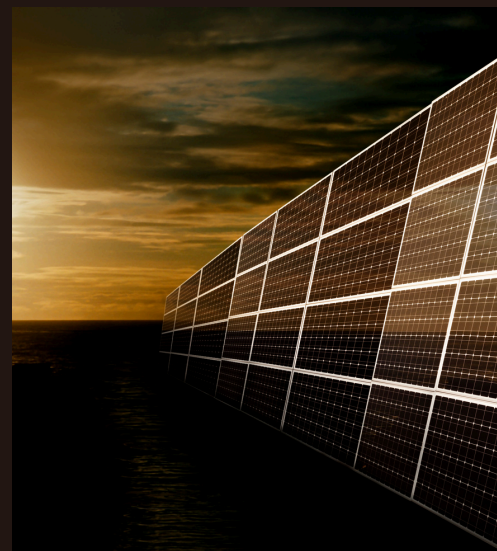
- **Inter-State Deals:** Governed by CERC DSM regulations. Deviations attract the higher of contract rate or normal penalty.
- **Intra-State Deals:** Follow RERC's 2017 regulations, ensuring accountability without strangling flexibility.

Cost Matters – All Charges at a Glance

GEOA isn't free—but it's structured, fair, and predictable.

Consumers pay:

1. Transmission Charges (as per RERC or CERC)
2. Wheeling Charges
3. Cross Subsidy Surcharge
4. Additional Surcharge
5. Banking & Standby Charges
6. Reactive Energy & DSM Charges
7. SLDC & Scheduling Charges



What Makes GEOA in Rajasthan Unique?

Relinquishing access early? There's a smart exit policy too:

- **No penalty** if you give a 1-year notice.
- **Only 66% of the charges** if exiting early without notice.

- **Mandated Storage for New RE Plants >5 MW:** Ensures grid stability.
- **Single-Window Central Portal** for applications.
- **Priority access** to green energy consumers after discom needs.
- **State-first approach:** Even inter-state sellers must follow state DSM accounting if connected to Rajasthan grid.

Earth Connect's Take

Rajasthan's GEOA is not just a regulation—it's a **gateway to clean, affordable, and decentralized energy**. For solar entrepreneurs, industrial users, and ESG-driven investors, it's time to act. The policy rewards early movers with flexibility, scale, and clarity.

So the next time you hear "open access", don't just think of bureaucratic hurdles—**think of opportunity, sustainability, and energy freedom.**

EARTH CONNECT

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