EARTH CONNECT

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

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EARTH-CONNNECT

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FROM THE EDITOR

Unlocking the Solar Potential of India's MSMEs

India's 60+ million MSMEs are the backbone of the economy—contributing 30% to GDP, employing 110+ million people, and consuming 20–25% of industrial energy. With electricity costs eating up 5%–20% of their expenses, solar offers a compelling solution—yet adoption remains limited.

The Missed Opportunity

Despite falling solar PV prices and strong ROI (typically <5 years), installations in the 50–500 kWp range are stuck in limbo—too large for DIY kits and too small for traditional EPCs, creating a persistent market gap.

Barriers on Both Sides

- MSMEs lack trust in vendors and face complex processes and financing hurdles.
- Solar developers struggle with high customer acquisition costs and low margins.
- Financiers face risks in underwriting small, decentralized projects due to lack of standardization and execution control.

The Way Forward: Programmatic Models
A bundled, digital-first approach can address these challenges—streamlining lead generation, financing, procurement, and performance monitoring. Global models (e.g., in Africa) show success with platform-driven strategies that link financing to project milestones.

Why India is Ready

- Rising electricity tariffs and awareness of solar ROI
- Strong base of emerging solar EPCs
- Growing appetite from lenders for clean energy portfolios
- Supportive policies: Net Metering, PM-KUSUM, Rooftop Solar Programme Phase II, and RBI's green lending framework
-

Key Enablers

✅ Innovative Finance: Leasing and pay-as-you-go models to remove upfront barriers
✅ Cluster-Based Solar Parks: Shared infrastructure for MSME industrial zones
✅ Awareness & Training: Practical education on tech, economics, and financing
✅ Standardization: Scalable, high-quality project design and delivery
✅ Technology: Platforms to automate project execution, monitoring, and credit assessment

A Call to Action

Solarizing MSMEs isn't just about saving costs—it's about transforming a sector and accelerating India's 500 GW clean energy goal by 2030. It requires collaboration across government, industry, and finance.
At Odyssey, we're enabling this vision—empowering solar EPCs with digital tools, supply chain credit, and standardized workflows to serve MSMEs at scale.
India's clean energy future lies with its entrepreneurs. The time to solarize MSMEs is now.

By Prashant Motwani
Country Director
India, Odyssey Energy Solutions

Green Ambitions Soar: Juniper Green Energy Files ₹30 Billion IPO to Power India's Clean Energy Future

In a bold stride towards accelerating India's green energy transition, Juniper Green Energy, a rapidly emerging independent renewable power producer, has filed its Draft Red Herring Prospectus (DRHP) with SEBI to raise over ₹30 billion (~$349 million) through an Initial Public Offering (IPO).

The IPO, which includes a fresh issue of equity shares with a face value of ₹10 each, is aimed entirely at fueling the company's long-term growth strategy, with no offer-for-sale component.

Powering Progress with Purpose

Juniper Green plans to allocate the raised capital to repay debts worth ₹10.92 billion (~$127 million) and invest ₹11.57 billion (~$135 million) into its subsidiaries—Juniper Green Gamma One and Three, Field, Beam, Kite, and Ray Two—reflecting the company's structured push for scalability and financial resilience.

As of May 31, 2025, Juniper's clean energy portfolio includes:

- **Wind Energy:** 5 projects totalling 382.15 MW in Gujarat, with 69.30 MW operational
- **Solar Energy**: 16 solar projects adding up to 1,350.38 MW across three Indian states

Recent Wins & National Footprint

In a recent Phase IX wind auction by Gujarat Urja Vikas Nigam, Juniper secured 50 MW at a competitive tariff of ₹3.65/kWh, alongside industry peers. The company continues to strengthen its position in India's high-potential renewable corridors, signaling confidence from both regulators and investors.

IPO Wave in Renewable Sector

Juniper's filing comes amidst a growing trend of green companies going public:

Prozeal Green Energy: ₹7 billion IPO filed in April
Rayzon Solar: Draft papers to raise ₹15 billion, funding a 3.5 GW TOPCon solar cell facility in Surat
Ather Energy: ₹31 billion IPO oversubscribed by 1.43 times by April-end

With this move, Juniper Green is not just tapping into capital markets—it's charging forward as a key enabler of India's energy independence and sustainable development agenda.

India Powers Ahead with 341 MWh Battery Storage Surge in 2024 — A Turning Point for Renewable Integration

In a landmark year for India's clean energy sector, the country added a record-breaking 341 MWh of Battery Energy Storage Systems (BESS) in 2024 — a staggering sixfold jump from the previous year's 51 MWh. This achievement marks a strategic pivot in India's renewable energy journey, positioning energy storage as a core enabler of grid stability, reliability, and round-the-clock clean power.

With these additions, India's total installed BESS capacity now stands at approximately 442 MWh, as of December 2024.

The Rise of a New Backbone in India's Energy Mix

This explosive growth is driven by a confluence of forward-looking policies, competitive tenders, and technological evolution. BESS is now playing a critical role in:

- Storing surplus solar energy
- Smoothing renewable intermittency
- Meeting peak power demand
- Reducing diesel generator dependency

Notably, 60% of the 2024 capacity came from solar + storage hybrids, 36% from RTC-integrated renewables, 4% from standalone BESS, and a small fraction from floating solar + storage projects.

Top Performing States

- Karnataka leads with 36% of total installations
- Chhattisgarh follows with 27%
- Gujarat contributes 17% to the national capacity

These states have shown strong policy support and infrastructure readiness, making them front-runners in India's energy transition.

The Road Ahead: GWh-Scale Ambitions by 2027

- India is projected to reach 15 GWh of BESS installations by 2027, driven by:
- Mandatory two-hour storage co-location for new solar projects
- Increased hybrid tenders and large-scale auctions
- Surge in corporate investments and improved bankability of storage assets

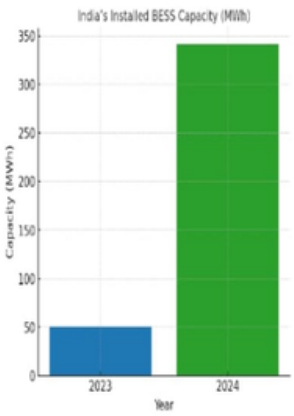
In 2024 alone, nearly 27 GW worth of storage tenders were floated and 17 GW of projects were auctioned, including standalone and hybrid setups. The number of solar-plus-storage tenders grew by a whopping 118% year-over-year, underscoring the market's appetite for hybrid solutions.

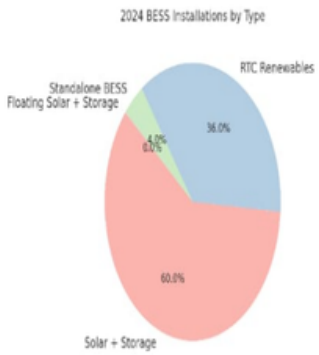
Investments & Pipeline Momentum

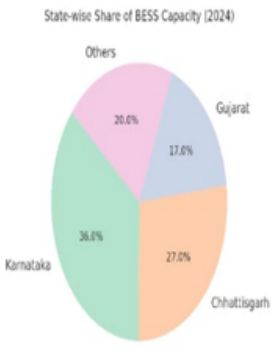
Building an Ecosystem: Manufacturing, Financing & Policy Synergy

- India's push for energy storage is backed by bold initiatives:
- Viability gap funding to reduce project risks
- PLI schemes to boost local battery manufacturing
- Mandatory 20% storage requirement in new RE projects through FY2030

This multi-pronged approach is helping reduce costs, de-risk projects, and attract greater institutional finance—mirroring the early success of the solar sector.







24x7 Solar is No Longer a Dream:
Battery Storage Turns Sunlight into Round-the-Clock Power

Revolutionary analysis reveals that 97% of full-year solar coverage is now technically and economically achievable

The energy world is on the brink of a transformation. With cutting-edge advancements in battery storage technologies, solar energy can now power homes and industries 24 hours a day, nearly 365 days a year, making true energy independence not just possible—but practical.

Recent technical simulations show that a 5 kW solar system, backed by a 17 kWh battery, can deliver a stable 1 kWh of power per hour across an entire day. The result? 97% full-year 24-hour solar coverage is already within reach in high-irradiance cities.

How It Works: From Sunlight to Steady Supply

A typical solar system generates most of its power during daylight. Of the 24 kWh produced daily, approximately 9.6 kWh is used in real time, while the remaining 15 kWh must be stored for nighttime use. With 90% usable battery capacity, a 17 kWh battery system is ideal for this cycle, enabling reliable discharge throughout the night.

Even in sunny cities like Las Vegas, where winter days are shorter, the variation in daily battery demand remains manageable—fluctuating between 15.8 kWh to 18.2 kWh. This makes it possible to standardize systems and reduce costs further.

Global Cities Race Toward Energy Autonomy

In a global simulation of solar+storage systems across 12 major cities, the results were eye-opening:

City	24-Hour Solar Reliability
Muscat (Oman)	99%
Mexico City	96%
Johannesburg	95%
Manila	92%
Abuja	92%
Hyderabad	89%
Madrid	88%
Buenos Aires	81%
Washington DC	81%
Wuhan	74%
Birmingham	62%

While weather and seasonal shifts still pose challenges in cloudier regions, strategic battery sizing and modest system oversizing allow solar systems to perform close to baseload levels in most geographies.

- Falling Battery Prices Accelerate Adoption
- Battery prices dropped 40% in 2024, reaching $165/kWh
- Auctions in Saudi Arabia hit new lows: $72/kWh

LFP (Lithium Iron Phosphate) batteries now dominate the market (80% share), offering safer, cobalt- and nickel-free solutions with 20-year warranties

As battery technologies evolve, even sodium-ion batteries—a lithium-free alternative—are being deployed in grid-scale projects, promising even lower costs ahead.

- Industry Applications: From Data Centers to Desert Resorts
- 100 MW data center in UAE now runs 100% on solar+storage

- 106 MW solar + 261 MWh BESS powers titanium processing in West Virginia
- Saudi Arabia's eco-resorts now run on a 400 MW solar project backed by 1.3 GWh of battery storage

Beyond the Grid: Reducing Infrastructure Costs

By enabling 24/7 solar power, battery storage reduces the need for costly transmission lines, transformers, and grid expansion. A single solar panel in sunny regions, once limited by grid constraints, can now support up to 5x more output when combined with storage.

In 2024 alone, over 3,000 GW of renewable projects globally were stuck in interconnection queues. Storage provides an elegant, fast-track solution to deploy this energy without waiting for grid upgrades.

The Bottleneck: Not Technology, But Mindset

Despite readiness, regulatory delays and risk-averse financing are slowing deployment. Power planners and investors must recognize the reliability, maturity, and cost-effectiveness of today's solar + storage systems.

Properly designed microgrids, especially for commercial and industrial users, are proving this reality. They not only reduce peak load dependence, but also offer price stability, backup power, and emissions-free operation.

What's Next?

- Global energy storage capacity expected to grow by 35% in 2025, adding 94 GW (247 GWh)
- Battery financing terms improving as confidence grows
- Next-gen enclosures and integration methods cut costs further

Conclusion: 24/365 Solar is Here—The World Just Needs to Catch Up

Solar energy, once a daytime-only player, is now ready for prime time, all the time. The combination of smart storage and falling costs puts us on the brink of a clean energy revolution where the sun truly never sets.

BIG PLAYERS SECURE BIG WINS: RELIANCE, JBM, SAEL LEAD NHPC'S 1.2 GW SOLAR-STORAGE AUCTION SURGE

In a major boost to India's renewable energy landscape, NHPC's Tranche-XI auction for 1.2 GW of solar power with integrated energy storage systems (ESS) has concluded with leading infrastructure and energy firms securing key contracts.

Reliance Infrastructure emerged as the top winner, bagging 390 MW, followed by PNC Infratech (300 MW), SAEL Industries (300 MW), JBM Renewables (150 MW), and Navayuga Engineering Company (60 MW).

All successful bids were locked at a competitive tariff of ₹3.13 (~$0.0365)/kWh, showcasing continued investor confidence in the hybrid solar-storage segment.

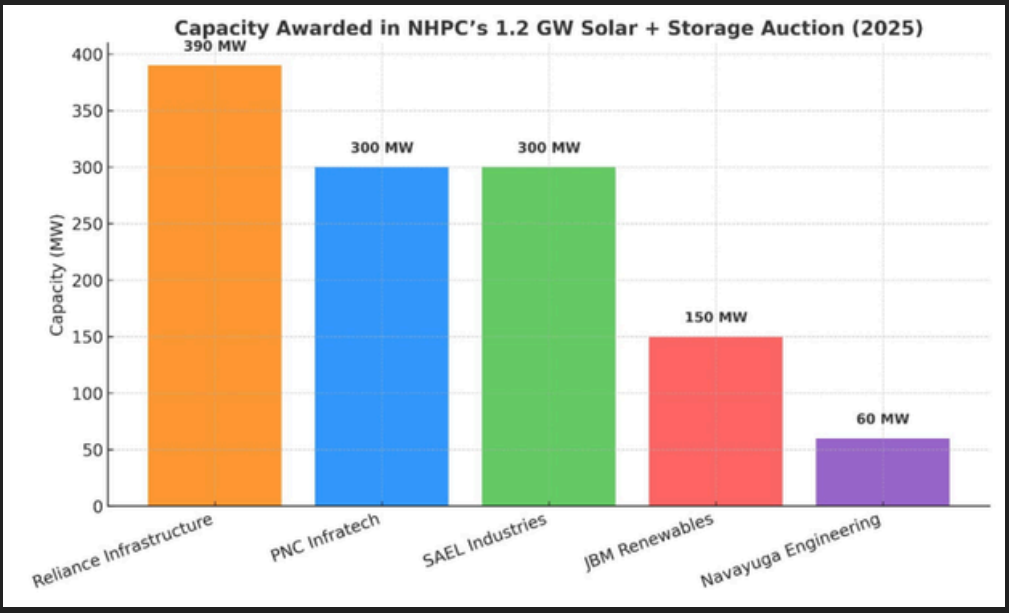
Floated in March 2025, the tender featured a greenshoe option—allowing an additional 1.2 GW to be awarded under the same framework. Projects will be executed on a build, own, and operate (BOO) basis, requiring the deployment of ESS systems with at least 0.5 MW/2 MWh for every 1 MW contracted.

Each bidder is permitted to develop multiple sites, with a minimum project size of 50 MW, and ESS integration of at least 25 MW/100 MWh per site. Importantly, the total awarded capacity for any developer was capped at 600 MW, with a proportional minimum ESS of 300 MW/1,200 MWh—ensuring a balanced and scalable energy transition.

All energy storage components must be charged by solar energy and may use up to 5% renewable energy annually from green markets or bilateral agreements, further promoting clean grid integration. Moreover, only components from the Approved List of Models and Manufacturers (ALMM) will be allowed, maintaining high-quality standards.

This marks another forward-looking step by NHPC to position India at the forefront of solar-plus-storage innovation—reducing grid stress, enhancing dispatch ability, and ensuring 24/7 renewable power delivery.

With similar momentum seen in earlier auctions—like SJVN's 1,200 MW tender won in May 2025—India is building a strong foundation for its energy-secure, storage-ready future.



EMPOWERING ABILITIES, POWERING WITH THE SUN: NATIONAL REHAB INSTITUTE SLASHES POWER BILLS BY 30% WITH ROOFTOP SOLAR

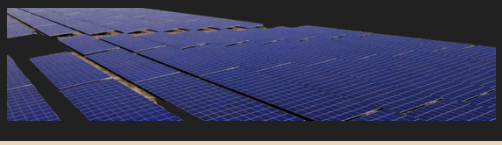
In a powerful stride toward sustainability and self-reliance, Pandit Deendayal Upadhyaya National Institute for Persons with Physical Disabilities, New Delhi, has installed a 102 kW rooftop solar system—a move that has already cut electricity costs by 30%.

The solar setup now powers critical rehabilitation machines and supports other energy needs across the institute. This transition not only promotes green energy but also demonstrates how institutions beyond the industrial sector are embracing clean power to reduce carbon footprints and optimize operational costs.

Dr. Jitendra Sharma, Director of the institute, shared that the monthly electricity bill, which earlier hovered between ₹5–6 lakh, has seen a savings of ₹1–1.5 lakh per month—translating to a reduction of ₹3.5 per kWh. At optimal solar irradiance, the system produces up to 100 units of electricity per day.
The solar plant, commissioned in January 2025 by Legrand, also aligns with the Ministry of Social Justice and Empowerment's broader sustainability goals. The institute, home to over 700 students pursuing graduate and postgraduate rehabilitation courses, also operates outpatient clinics for persons with disabilities—services now partly powered by the sun.

This successful solar adoption echoes a broader trend across India, with even religious institutions like Ramakrishna Yogashrama on the outskirts of Bengaluru turning to solar rooftops to meet their growing energy needs.

As India progresses toward its renewable energy targets, stories like these showcase how education, healthcare, and spiritual centers are becoming quiet but powerful players in the solar revolution—bringing light, savings, and sustainability under the same roof.



MNRE TIGHTENS ALMM NORMS FOR GOVERNMENT SOLAR PROJECTS: NEW CLARITY FOR BEHIND-THE-METER INSTALLATIONS

In a move to strengthen quality assurance and promote domestic manufacturing, the Ministry of New and Renewable Energy (MNRE) has issued a key clarification on the Approved List of Models and Manufacturers (ALMM) compliance for behind-the-meter solar projects used by government bodies and public sector enterprises.

MNRE has now mandated the use of ALMM-listed solar modules for such government-backed projects meant for captive consumption. However, a conditional exemption has been provided — solar cells not listed under ALMM may still be used for installations commissioned before June 1, 2026. Projects beyond this date must fully comply with the ALMM list for both modules and cells.

Government Projects Under Stricter Scrutiny

The clarification comes in response to stakeholder queries about exemptions for behind-the-meter solar connections. While MNRE had earlier exempted private behind-the-meter projects (for self-use or group captive use) from ALMM compliance in 2022, the Ministry has reaffirmed that this exemption does not apply to government or PSU projects. Such entities have been under ALMM obligations since the beginning.

Domestic Manufacturing Gets a Boost

The updated ALMM list now boasts a total approved module manufacturing capacity of 90.95 GW, with 105 registered manufacturers. Notably:

- Reliance Industries joined the list with a capacity of 1,716 MW
- Avaada Electro added 1,272 MW, reflecting strong industrial momentum

Technical Differentiation & Forward Outlook

- Earlier this year, MNRE also clarified technical standards under ALMM:
- PID (Potential Induced Degradation) and non-PID solar cells will be treated as distinct product families
- Virtual, group net metering, and net billing systems are now treated on par with net metering for ALMM compliance

Furthermore, the Ministry reiterated that List-II (solar cells) will be fully enforced under ALMM from June 2026, a strategic move to ramp up domestic solar cell production and reduce reliance on imports.

It Matters?

This step is a part of India's larger push for Atmanirbhar Bharat in renewable energy, ensuring that publicly funded solar projects are built on quality-certified, domestically produced components—aligning policy with performance and self-reliance.

RSA KNOWLEDGE ADDA

Watt & Wash: The Sparkling Science of Solar Panel Maintenance!

As solar adoption soars across rooftops in India, one thing is clear: clean panels generate more power. Just like your car windshield, even the sleekest solar panels need a good wash now and then. Dust, dirt, bird droppings, and pollution can reduce panel efficiency by 15–30%, impacting your energy output and savings

DOS AND DON'TS OF SOLAR ROOFTOP WASHING & MAINTENANCE

✔️DOS	❌ DON'TS
✔️CLEAN YOUR PANELS EARLY MORNING OR LATE EVENING TO AVOID THERMAL SHOCK	❌ NEVER CLEAN DURING THE HEAT OF THE DAY OR WHEN PANELS ARE HOT
✔️USE SOFT BRUSHES, MICROFIBER CLOTHS, OR WATER-FED POLES	❌ AVOID ABRASIVE TOOLS OR METALLIC SCRUBBERS
✔️USE CLEAN, DEMINERALIZED WATER TO PREVENT WHITE SPOTS OR SALT BUILD UP	❌ DON'T USE HARD WATER OR CHEMICAL DETERGENTS
✔️ALWAYS SWITCH OFF THE INVERTER AND ISOLATE THE SYSTEM BEFORE CLEANING	❌ NEVER CLEAN A LIVE SYSTEM – ELECTROCUTION RISK!
✔️ENSURE SOMEONE IS THERE WITH YOU—FOLLOW SAFETY HARNESS PROTOCOLS ON ROOFTOPS	❌ DON'T CLEAN PANELS BAREFOOT OR WITHOUT PROPER FOOTWEAR
✔️MONITOR THE ENERGY OUTPUT REGULARLY TO DETECT PERFORMANCE DROPS	❌ NEVER IGNORE ERROR MESSAGES ON YOUR SOLAR MONITORING APP
✔️SCHEDULE PROFESSIONAL MAINTENANCE ONCE A YEAR	❌ DON'T ASSUME YOUR SYSTEM IS "SET AND FORGET"

Pro Tip:

Install panels at a tilted angle—it improves generation and helps rainwater wash off dust naturally!

Solar Care = Smart Savings

From residential homes to industrial sheds, a clean solar system is your silent money-saver. So don't let grime steal your shine—Watt & Wash the RSA way!

RSA Insight:

"Maintenance is not a cost, it's an investment in cleaner power and safer systems."

RAJASTHAN SHINES BRIGHT IN RENEWABLE ENERGY

Is Rajasthan really leading India in renewable energy?

TRUE...

According to the official report from the Ministry of New and Renewable Energy (MNRE), Rajasthan once again holds the No. 1 position in total renewable energy capacity — including solar, wind, and biomass.

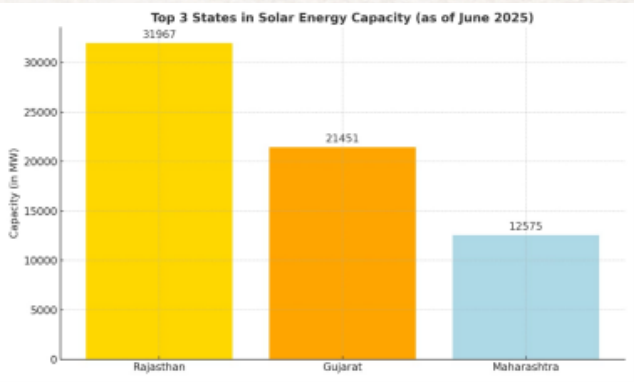
Fact :

Total Renewable Energy Capacity (as of June 2025)

- · Rajasthan: 37,818 MW
- · Gujarat: 37,494 MW

RAJASTHAN HAS ADDED 500 MW IN A MONTH, GROWING FROM 35,400 MW IN MAY TO 35,900 MW IN JUNE.

SOLAR ENERGY CAPACITY – LEADING THE NATION



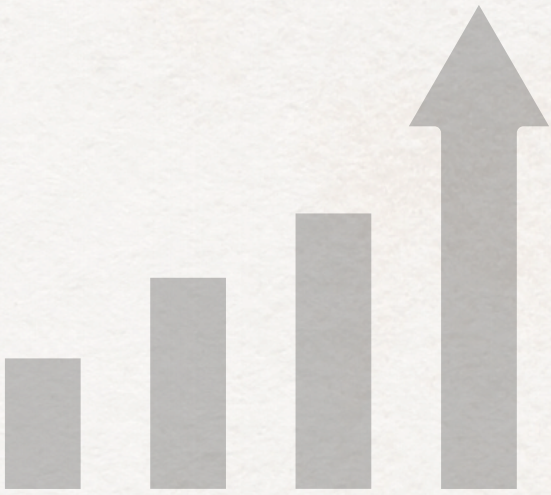
RAJASTHAN: 31,967 MW (RANK 1)

GUJARAT: 21,451 MW (RANK 2)

MAHARASHTRA: 12,575 MW (RANK 3)

Wind Energy Capacity – Holding Steady

- Gujarat: 13,816 MW (Rank 1)
- Tamil Nadu: 11,830 MW
- Karnataka: 7,714 MW
- Maharashtra: 5,307 MW
- Rajasthan: 5,208 MW (Rank 5)



FINAL VERDICT:

RAJASTHAN IS NOT ONLY LEADING THE SOLAR REVOLUTION BUT ALSO RAPIDLY EXPANDING ITS OVERALL RENEWABLE ENERGY FOOTPRINT. BACKED BY MNRE DATA, THE STATE'S POSITION IS STRONG, CONSISTENT, AND FUTURE-READY.

Bharat 2026 Renewable Expo

Organizer: The RSA

Co-Organizer: FirstVIEW Intelligent Business

Bharat RenewableExpo2026 has grown into one of India's most significant meeting points forcleanenergyprofessionals, placing it at the forefront of the country's renewable energy movement. A key enabler of dialogue between national and regional stakeholders, the event offers an opportunity to connect with influential buyers, decision-makers, and solution providers across the clean energy value chain. Exhibitors will showcase cutting-edge technologies that drive sustainable energy solutions, forge strategic partnerships, and explore opportunities to shape the future of energy.

KEY EXHIBITOR ADVANTAGES:

Showcase Innovations: Launch new products and technologies to a focused audience, sparking immediate interest and market traction.

Forge Strategic Alliances: Network with industry leaders, key decision-makers, and government representatives to build long-term partnerships.

Present your offerings live, enabling faster deal closures and on-the-spot contract f inalizations.

Boost Brand Recognition: Elevate your brand as a pioneer in India's green energy sector with unmatched visibility.

Exclusive Networking Access: Participate in curated networking sessions and VIP events designed for high-impact interactions with influential stakeholders.

16-17-18 JANUARY 2026 JAIPUR

+91-9829089017

SALES@BHARATRENEWABLEEXPO.COM

WWW.BHARATRENEWABLEEXPO.COM

EARTH CONNECT

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

INSIDE

CONTRIBUTING WRITERS

GAURAV VERMA

R&D OFFICER

DESIGNED BY

Sakshi Nahta

GRAPHIC DESIGNER

CONTACT US!

For more details

+91-9829089017

RSA@RAJASTHASOLARASSOCIATION.COM

WWW.RAJASTHASOLARASSOCIATION.COM