

AUGMENTING VALUE

# INDIA'S SOLAR UTILITY SCALE MARKET OUTLOOK TILL 2032

The \$200 Billion Market- A complete strategic intelligence on market, policy, finance, risk & 250+ projects intelligence tracker

## KEY QUERIES ANSWERED

- Indexation of states for region wise manufacturing hub fitment analysis for semiconductors in India
- What would be the supply chain dynamics and what opportunity it will unfold till 2030?
- What would be the investment roadmap for the semiconductor fabrication players till 2030?
- What would be the investment roadmap for semiconductor assembly, testing, marking, & packaging till 2030?



## India's solar utility scale market offers a business case of US\$ 200 Billion by 2032

- This report — **India's Solar Utility-Scale Market Outlook till 2032**, presents a value chain wise opportunity breakup of the \$200 Billion market. It is the most comprehensive institutional-grade intelligence study available on this market. It spans 18 chapters, 250+ project-level data records, 28 state analyses and a full six-year forecast horizon across bull, base and bear scenarios. To unlock the detailed coverage, write to us at [sales@eninrac.com](mailto:sales@eninrac.com)

India stands at the most consequential inflection point in its energy history. Driven by binding policy mandates, structural demand growth, rapidly declining technology costs and an increasingly sophisticated project finance ecosystem, the country's utility-scale solar sector is transitioning from an emerging market opportunity to a fully institutionalized, large-scale asset class commanding serious capital allocation from the world's leading investment banks, infrastructure funds, multilateral development banks and energy utilities.

India must add approximately 38 GW of capacity annually till 2032 to meet its 372 GW solar utility scale target. At a capital cost of US\$ 550–650/kW, this translates to a total investment requirement of US\$ 144–171 billion over the period of 7 years—making Indian utility-scale solar one of the largest infrastructure investment opportunities globally. With sovereign policy backing, improving offtake credit frameworks, competitive tariffs, and a maturing project finance market, the risk-adjusted return profile is now compelling for institutional capital at scale.

## India's Strong Renewable Energy Policy Architecture that Positions it as a Key Hub for VC and PE Investments

India's solar policy framework is now one of the most comprehensive in the world. The government's National Solar Mission (NSM), anchored by the 500 GW renewable energy target under India's Nationally Determined Contributions (NDCs) and the PANCHAMRIT climate commitments made at COP26, provides a clear, legally-backed demand signal through 2030 and beyond.

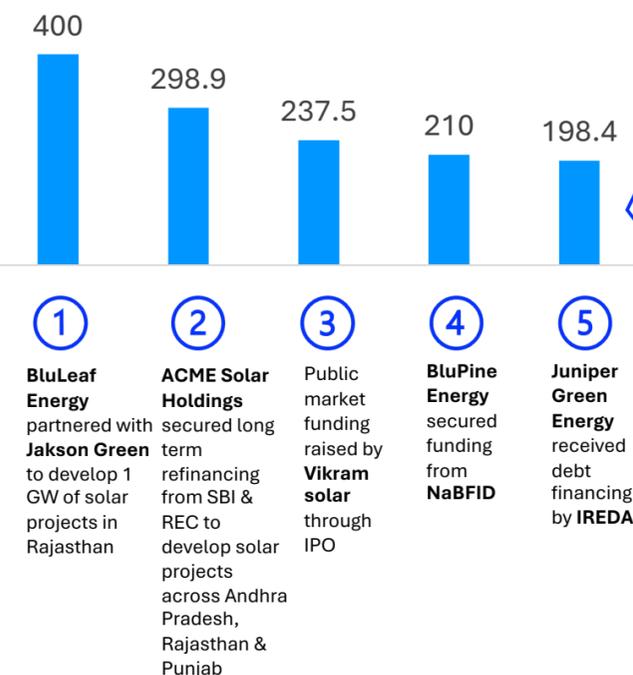
**ALMM & BCD Framework:** The Approved List of Models and Manufacturers (ALMM) and the 40% Basic Customs Duty (BCD) on imported solar modules have fundamentally reshaped India's supply chain landscape, accelerating domestic manufacturing under the Production Linked Incentive (PLI) scheme. Over 65 GW of integrated wafer-to-module manufacturing capacity is being commissioned by 2026–2027, materially reducing India's dependence on Chinese imports.

**ISTS Waiver & RPO Mandates:** The ongoing Inter-State Transmission System (ISTS) waiver for renewable energy projects — now extended through 2026 — continues to underpin the financial viability of large-scale solar projects. Renewable Purchase Obligations (RPOs) have been progressively raised, with the solar-specific RPO set at 40% by FY2030, creating a structural demand floor for solar power offtake

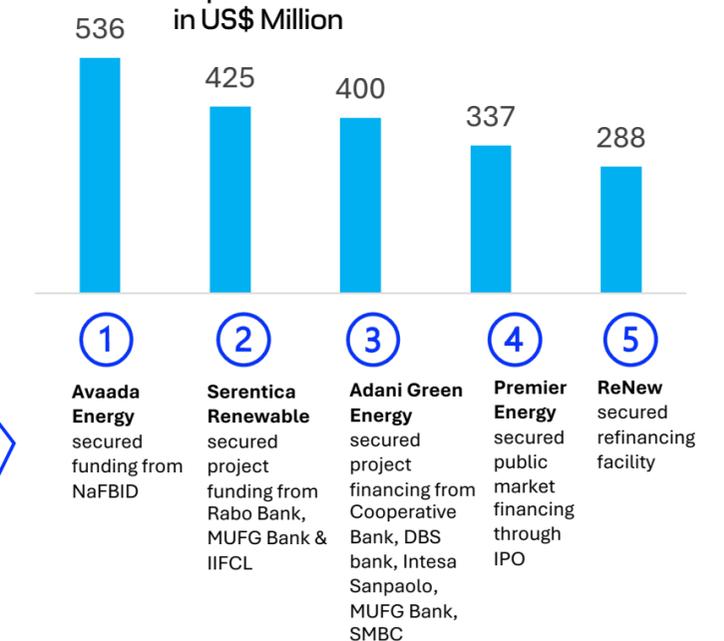
## Exhibit 01: Marquee Funding Deals/Partnerships in India's Solar Sector during 2024 & 2025

### Top 5 Investment Deals in India's Solar Sector in Year 2024 & 2025

Top Deals Secured in 2025 & their Value in US\$ Million



Top Deals Secured in 2024 & their Value in US\$ Million



Source: Eninrac Consulting, Press Release



**Capacity Outlook: Annual Additions and Investment Requirements from 2026 to 2032**

India's installed utility-scale solar capacity stood at approximately 109.5 GW of the total solar installed capacity of 143.6 GW as of Feb 2026. The solar utility scale capacity is targeted to reach to 372 GW by 2031-32. To achieve this capacity, annually at least 38 GW of the capacity build up is required from a period 2026-2032.

**Rolled out Capacity: Solar Utility Scale Tenders by SECI from 2023 till Feb 2026**

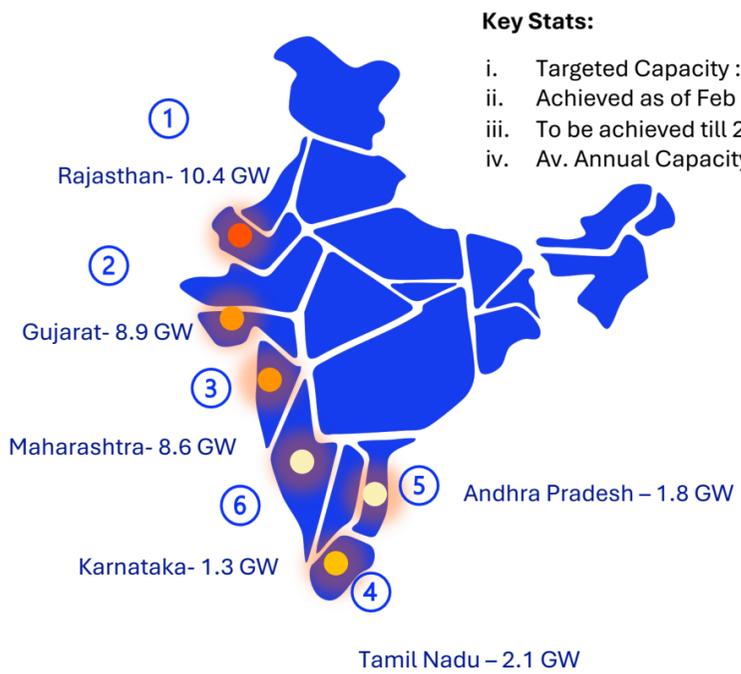
SECI rolled out nearly **18.4 GW** of standalone solar PV tenders from 2023 till 2026. Additionally, **100 MW** of floating solar tender, **2.8 GW** of solar capacity under FDRE tenders and nearly **4 GW** of wind solar hybrid tenders. All-in-all total **25.3 GW** of RE tenders inclusive of solar utility scale has been rolled out from SECI during the period 2023-2026 (Jan).

**Tariff Economics & Project Returns: The Return Profile is Now Institutional Grade**

Solar tariffs in India have declined by over 85% since 2010, reaching a historic low of ₹1.99/kWh in 2023 and stabilizing at ₹2.20–2.50/kWh in 2024–2025 following the impact of BCD and module cost increases. This floor-level tariff environment, combined with improving operational track records and declining project risks, has created a compelling risk-adjusted return profile for institutional investors

**Exhibit 02 : Anticipated Investment Requirement to Scale India's Targeted Utility Scale Solar Capacity till 2032**

Top States (Map) with Highest Solar Capacity Addition from Mar'2025-Feb'2026



- Key Stats:**
- i. Targeted Capacity : 372 GW
  - ii. Achieved as of Feb 2026: 109.4 GW
  - iii. To be achieved till 2032: 263 GW
  - iv. Av. Annual Capacity Addition: 38 GW

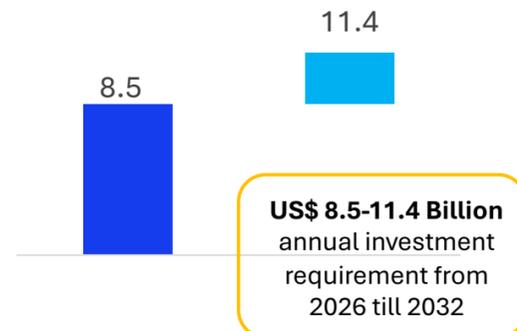
**Case 1: Ideal Capacity Addition Scenario**  
38 GW Annual Addition



**Case 2: 80% of Ideal Capacity Addition Scenario**  
30.4 GW Annual Addition



**Case 3: 50% of Ideal Capacity Addition Scenario**  
19 GW Annual Addition



**Case 4: 20% of Ideal Capacity Addition Scenario**  
7.6 GW Annual Addition



Source: Eninrac Consulting, MNRE

**Exhibit 03 : Typical Tariff Economics & Project Returns for Solar Projects in India**

| Parameters                                   | Fact Sheet                   |
|--|------------------------------|
| Lowest Discovered Solar Tariff (India, 2023) | ₹1.99 / kWh                  |
| Benchmark Tariff Range (2025)                | ₹2.37 – 3.10 / kWh           |
| Typical Utility-Scale Project Capital Cost   | USD 550–650 / kW (2025)      |
| Project Debt-to-Equity Ratio (typical)       | 70:30 to 75:25               |
| DSCR Benchmark (operating projects)          | 1.20x – 1.40x                |
| Equity IRR Range (utility-scale, base case)  | 13% – 16%                    |
| Equity IRR — Hybrid Solar+Wind / Solar+BESS  | 14% – 18% (with VGF support) |
| Debt Tenor (domestic project finance)        | 18–22 years                  |
| Average PLF / CUF (national benchmark)       | 19% – 25%                    |

Source: Eninrac Consulting



**Capital structure, financing landscape & investor ecosystem**

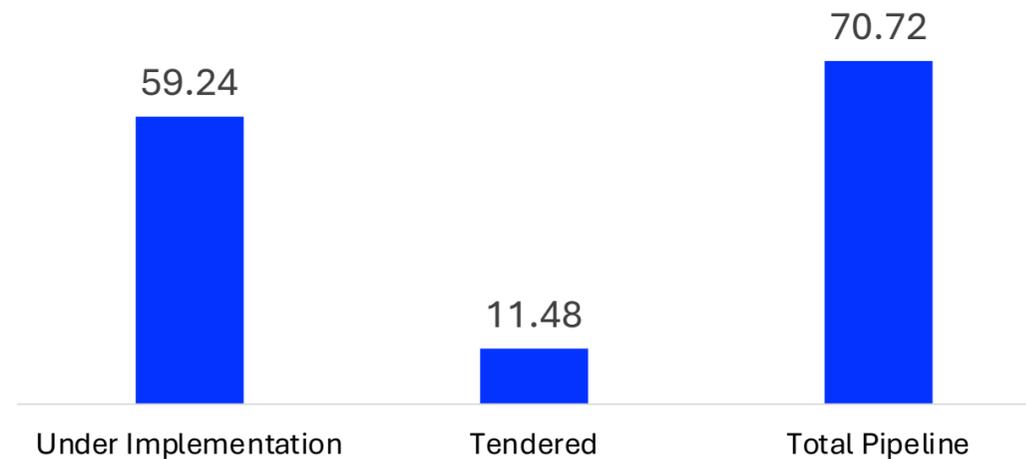
India's renewable energy project finance market has matured significantly, with a deep domestic banking system now actively supporting utility-scale solar through long-tenor rupee debt. State Bank of India (SBI), REC Limited, Power Finance Corporation (PFC) and Indian Renewable Energy Development Agency (IREDA) collectively account for over 60% of project debt to the sector. International financing from multilateral development banks (ADB, IFC, AIIB, World Bank), bilateral development finance institutions (JBIC, DEG, FMO, Proparco) and Export Credit Agencies (ECA) is providing catalytic capital, particularly for first-of-kind hybrid and storage projects.

Green bonds and sustainability-linked instruments have emerged as a critical financing channel, with Indian renewable energy issuers raising over USD 8 billion in green bonds between 2020 and 2025. The establishment of India's Carbon Credit Trading Scheme (CCTS) under the Energy Conservation (Amendment) Act, and the framework for trading in India's carbon market, creates an additional revenue layer for utility-scale solar developers that is expected to become financially material by 2027-2028

**The Next Frontier: Round-the-Clock Renewable Power & Storage**

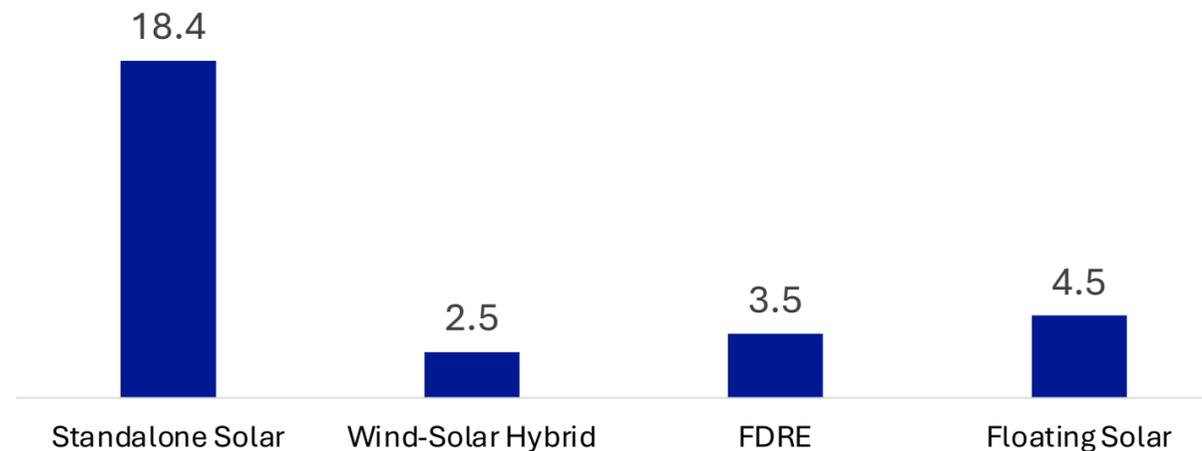
The era of single-technology, peak-sunlight solar generation is giving way to a more sophisticated market structure defined by hybrid and dispatchable renewable power. India's Round-the-Clock (RTC) renewable power procurement framework – requiring developers to supply firm, schedulable power – has catalyzed a USD 25-30 billion hybrid and storage investment wave that is reshaping project economics, technology selection and capital allocation strategies across the sector.

**Exhibit 04 : Under Implementation Round-The-Clock/Hybrid/FDRE Projects (GW) in India**



Source: Eninrac Consulting, SECI

**Exhibit 05 : Solar Utility Scale Capacity (GW) Tendered by SECI in India from 2023-Jan '2026**



Source: Eninrac Consulting, SECI

**Exhibit 06: Latest Tender Auction Results for RTC/Hybrid/FDRE Projects in India**

① CESC's Tender Auction Result for 600 MW Wind-Solar Hybrid Projects- Mar 2026

| Bidder's Name          | Total Capacity (MW) | Tariff (INR/KWh) |
|------------------------|---------------------|------------------|
| Vismaya Renewables     | 100                 | 3.74             |
| Hexa Climate Solutions | 100                 | 3.75             |
| Purvah Green Power     | 300                 | 3.75             |
| Sprng Energy           | 100                 | 3.75             |

② SECI Tender Auction Result for 1200 MW FDRE Project- Feb 2026

| Bidder's Name           | Total Capacity (MW) | Tariff (INR/KWh) |
|-------------------------|---------------------|------------------|
| Adyant Enersol          | 100                 | 6.27             |
| Serentica Renewable     | 600                 | 6.28             |
| AMPIN Energy Transition | 199                 | 6.28             |
| ACME Solar              | 301                 | 6.28             |

Source: Omnicore Plus



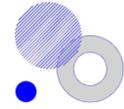
**Structured Risk Assessment for Institutional Decision Making**

India's utility-scale solar sector offers compelling returns, but a rigorous understanding of its risk landscape is essential for institutional capital deployment. The following risk matrix captures the key exposures identified across this study's 18 chapters and 250+ project records, together with the primary mitigation levers available to sophisticated investors

**Exhibit O7 : Risk Assessment for Institutional Decision Making to Enter into India's Solar Market**

| Risk Category       | Key Risk Factor  | Severity   | Mitigation Lever                                       |
|---------------------|--|------------|--|
| Offtaker / Payment  | DISCOM credit risk; payment delays of 90–180 days      | High       | LC/escrow mechanisms; central PSU offtake (SECI/NTPC)  |
| Tariff & Revenue    | Merchant price exposure; PPA renegotiation pressure    | Medium     | Long-tenor fixed PPAs; C&I diversification             |
| Grid / Curtailment  | Intra-state evacuation bottlenecks; DSM charges        | Medium     | ISTS connectivity; state grid assessment pre-bid       |
| Construction / EPC  | Module delivery delays; land clearance slippages       | Medium     | Back-to-back EPC; liquidated damages clauses           |
| Land Acquisition    | Forest & revenue land clearances; community opposition | High       | Land bank partners; solar park procurement             |
| FX / Currency       | INR/USD depreciation; import cost exposure             | Medium     | ECB hedging; INR-denominated financing preference      |
| Policy / Regulatory | BCD revision; ALMM expansion; RPO rollback risk        | Low-Medium | PPA price-passthrough clauses; contractual protections |
| Technology / BESS   | Battery degradation; thermal management; warranty risk | Medium     | Performance guarantees; O&M contracts; insurance       |
| Climate / Resource  | P90 underperformance; monsoon irradiation variability  | Low        | P90 design basis; weather index insurance              |

Source: Eninrac Consulting



## Must Buy For

- Utility scale Solar Project Developers
- (EPC) Contractors
- Solar Module Manufacturers (c-Si, TOPCon, HJT, Thin Film)
- Inverter Manufacturers (Central & String Inverters)
- Balance of System (BoS) Component Suppliers (Mounting Structures, Trackers, Cables, Transformers)
- Solar Tracker Manufacturers (Single-axis, Dual-axis Systems)
- Energy Storage System (ESS) Providers (BESS Integrators & OEMs)
- Battery Manufacturers (Li-ion, LFP, Sodium-ion, Flow Batteries)
- Power Electronics Providers (PCS, Inverters, Controllers)
- Grid Infrastructure & Transmission Companies (TSOs, Substations, HV Equipment)
- SCADA, Monitoring & Digital Solutions Providers (Energy Management Systems, AI Optimization)
- Operations & Maintenance (O&M) Service Providers
- Asset Management & Performance Analytics Firms
- Utilities & Offtakers (Public & Private DISCOMs, Corporates – PPA Buyers)
- Corporate Renewable Energy Buyers (RE100, Data Centers, Industrial Offtakers)
- Green Hydrogen Developers (Solar-to-Hydrogen Integration Players)
- Land Aggregators & Site Development Firms
- Environmental & Social Impact Consultants (EIA, Permitting)
- Government Ministries & Renewable Energy Agencies
- Regulators & Grid Operators
- State Renewable Development Corporations & Investment Promotion Agencies
- Multilateral Agencies & Climate Finance Institutions
- Infrastructure Funds, Pension Funds & Sovereign Wealth Funds
- Project Finance Banks & Green Bond Investors
- Carbon Credit & Renewable Energy Certificate (REC) Market Platforms
- Insurance Providers (Project, Performance, Weather Risk)
- Consulting, Technical Advisory & Due Diligence Firms (Lenders' Engineer, Resource Assessment)
- Research Institutions & Testing Labs (Module Certification, Performance Testing)
- Recycling & Circular Economy Players (End-of-life Panels, Batteries)



## Company Profiling

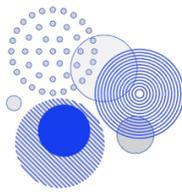
- Adani
- ReNew Energy Global
- Tata Power Renewable
- NTPC Renewable
- Azure
- Avaada
- Hero Future Energy
- Sembcorp Green Infra
- JSW Energy
- EDF Renewables
- KPI Green



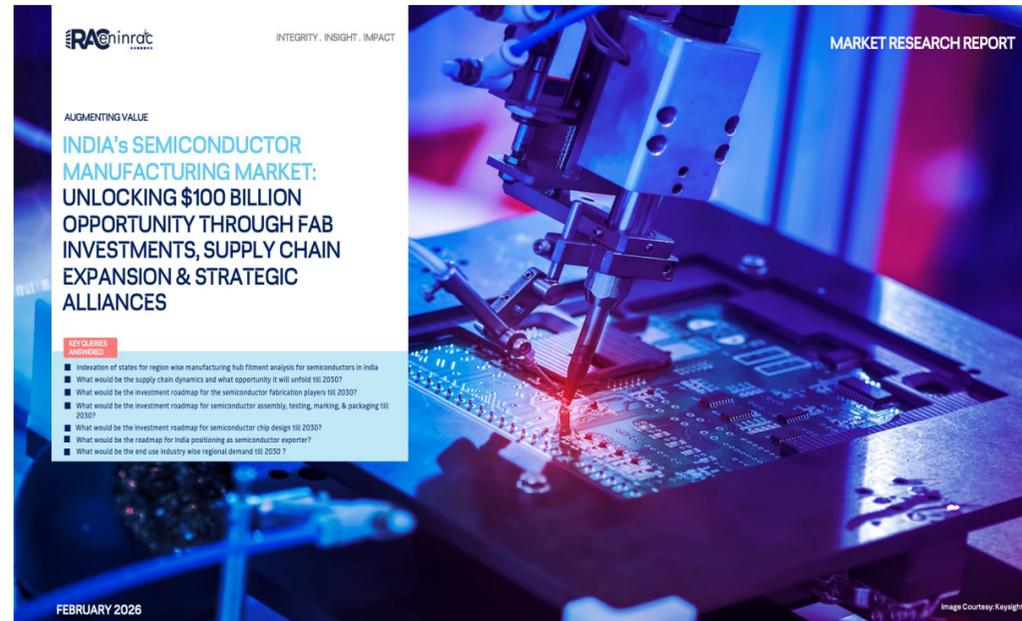
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**KEY QUESTIONS ANSWERED**

- Indication of states for region wise manufacturing hub fitment analysis for semiconductors in India
- What would be the supply chain dynamics and what opportunity it will unfold till 2030?
- What would be the investment roadmap for the semiconductor fabrication players till 2030?
- What would be the investment roadmap for semiconductor assembly, testing, marking, & packaging till 2030?
- What would be the investment roadmap for semiconductor chip design till 2030?
- What would be the roadmap for India positioning as semiconductor exporter?
- What would be the end use industry wise regional demand till 2030 ?

FEBRUARY 2026 Image Courtesy: Keysight



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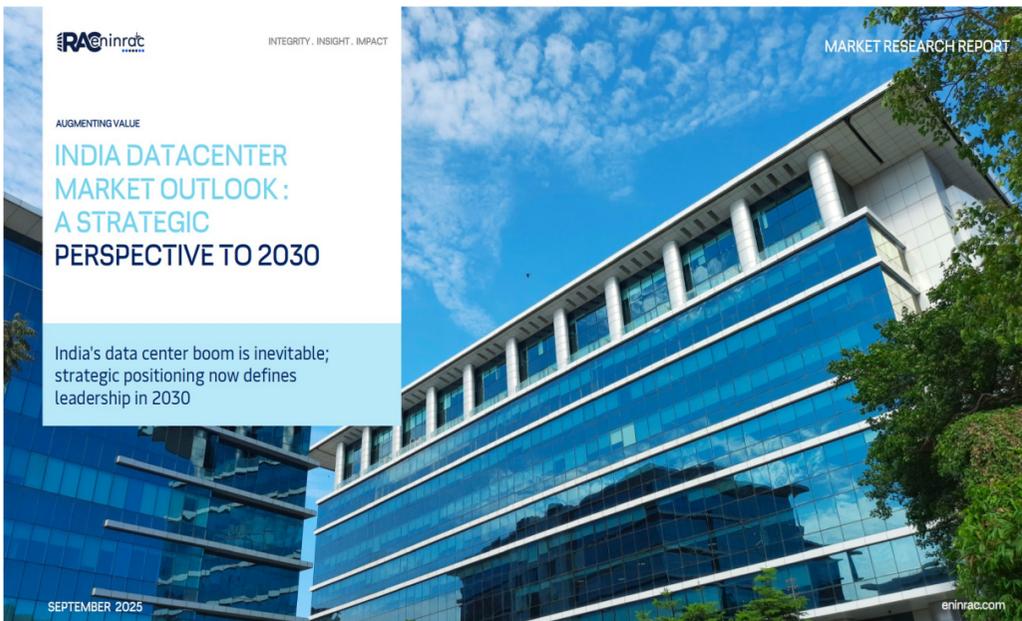
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### EUROPE DATACENTER MARKET OUTLOOK : A STRATEGIC PERSPECTIVE TO 2030

**KEY QUESTIONS ANSWERED**

- What investment potential does Europe's datacenter market holds for the value chain?
- Which are the emerging datacenter hubs in Europe offering high ROI?
- What policy, regulatory, and financing frameworks are enabling the scale-up?
- What opportunity does Europe's datacenter market holds for the grid operators, BESS solution providers and power utilities ?
- What opportunity does Europe's datacenter market holds for the EPC players?

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“ The life of a man consists not in seeing visions and in dreaming dreams, but in active charity and in willing service

- Henry Wadsworth Longfellow

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Eninrac's USP lies in its ability to deliver pragmatic, data-driven solutions tailored to the unique needs of each client. By maintaining close collaboration and adopting a hands-on approach, they ensure that their insights are actionable and aligned with clients' strategic objectives. This personalized guidance through diverse markets and cultures sets them apart in the consulting landscape. By leveraging the services offered, Eninrac Consulting empowers businesses to improve processes, understand customers, and solve problems effectively, thereby driving growth and maintaining a competitive edge in their respective industries.

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