

INDIA ENERGY TRANSITION OUTLOOK 2026-2035

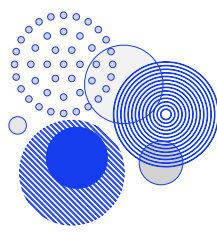
Decoding the \$500B+ Decade – Market Sizing, Investment Flows & Strategic Roadmap Across India's Full Clean Energy Value Chain

The report comprehensively mapping India's \$500B+ energy transition across solar, wind, storage, green hydrogen, EVs, and grid modernization with bottom-up modelling across 36 states, five proprietary models, LCOE trajectories, competitive intelligence, FDI frameworks, and risk-adjusted IRR corridors under three scenarios which is delivering actionable playbooks for every value chain participant through 2035.

KEY QUERIES
ANSWERED?

- Where to deploy capital in India's energy transition bid?
- Which states offer the best FDI returns & is anticipated by investors?
- Which are the most attractive value chain segment for entering in India?
- How will policy reshape the market dynamics?





Why is Eninrac's India Energy Transition Outlook 2026–2035 essential for mapping \$500B+ cross-sector investment opportunities, analyzing LCOE trajectories and full value chain revenue pathways across solar, wind, storage, and green hydrogen, evaluating 500 GW renewable targets and FDI-ready policy frameworks, and positioning your organization to lead India's defining decade of clean energy transformation across all states and the entire transition ecosystem?

Will India's energy transition successfully leverage 500 GW renewable targets, PLI-driven manufacturing scale, and FDI-ready policy frameworks to unlock \$500B+ in cross-sector investment opportunities by 2035, or will DISCOM financial distress, grid absorption constraints, ALMM compliance burdens, and critical mineral supply chain vulnerabilities cap deployment momentum before India consolidates its position as the world's most competitive clean energy market?

- Why is a comprehensive assessment of India's energy transition landscape spanning renewable power, green hydrogen, energy storage, clean mobility and grid modernization to convert its natural and policy endowments into lasting industrial and economic leadership?

Executive Summary – The Energy Transition Frontier for India

India's clean energy ambition for 2030 is among the most consequential infrastructure undertakings in the world. With 205 GW of renewable energy installed as of 2024 against a 500 GW non-fossil target by 2030, the nation must add roughly 295 GW of new capacity in six years an average annual deployment rate the country has never sustained before. Eninrac's technology-wise gap analysis reveals not just the scale of the challenge, but the precise capital, execution and policy levers required for each segment to deliver on schedule.

Demand Inflection Points Across India's Energy Transition: Sector-Wise Electrification Outlook

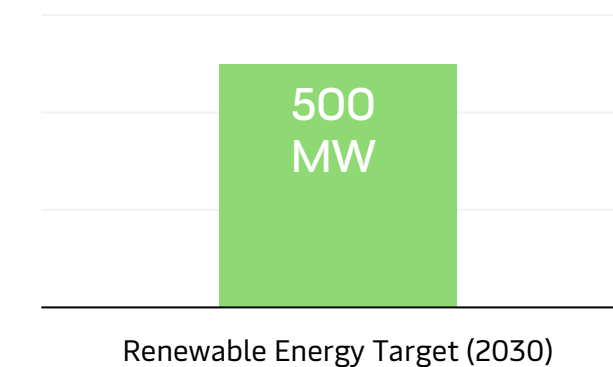
India's energy transition story is not solely a supply-side narrative of gigawatts added and tariffs falling. It is equally and perhaps more fundamentally a demand-side transformation unfolding across five critical sectors of the economy. Industry, transport, buildings, agriculture and digital infrastructure are each approaching structural inflection points where electrification shifts from incremental adoption to system-wide restructuring.

Energy Transition – Demand imperative, policy lock-in, cost tipping point, manufacturing inflection – Key Triggers for India

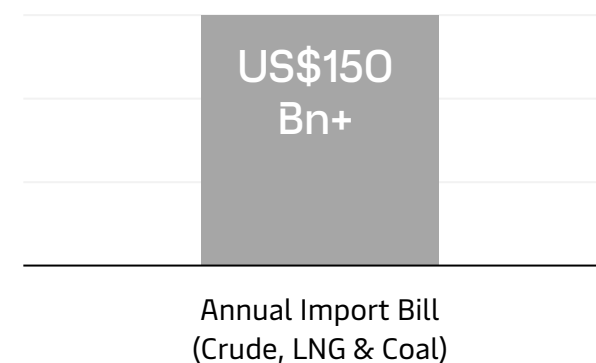
1 India Investment Opportunity - US\$ Bn



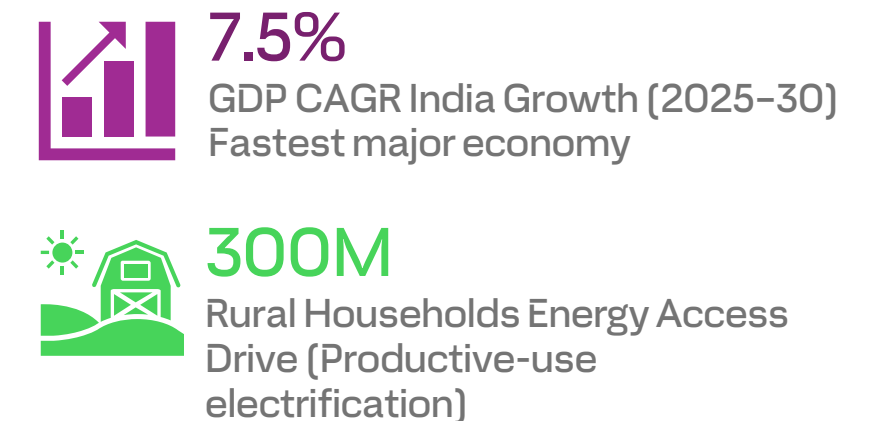
2 Renewable Energy Target by 2030 (Solar, Wind, Hydro, Storage)



3 Annual Import Bill (Crude, LNG, Coal)



4 Energy Access Drive & India GDP Growth



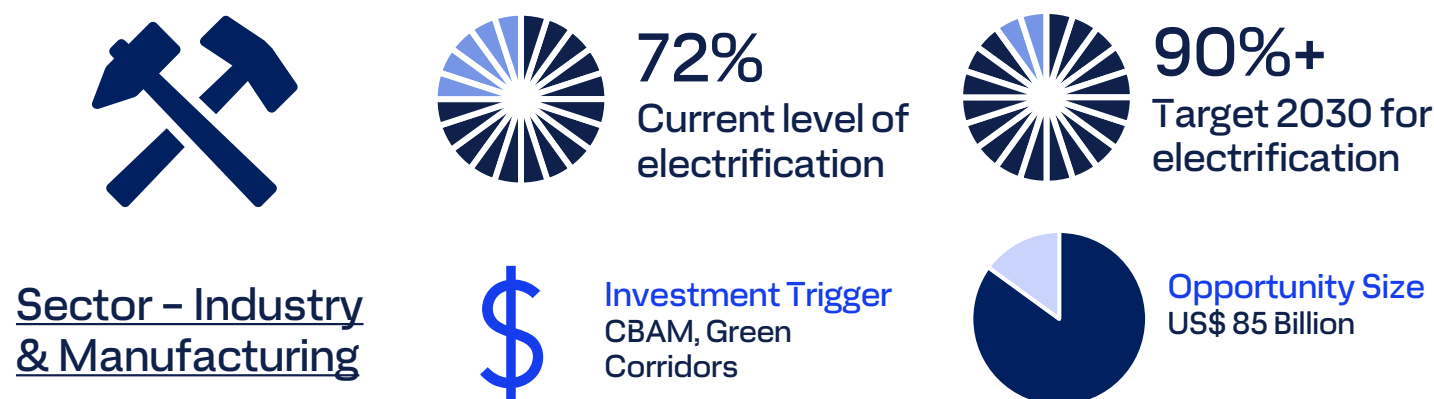
Source: eninrac consulting, eninrac analysis

“Eninrac's sector-wise analysis maps the current electrification baseline, the 2030 target, the investment triggers driving acceleration, and the aggregate opportunity each sector represents”

Industry & Manufacturing – The US\$ 85 Billion Green Corridor Imperative

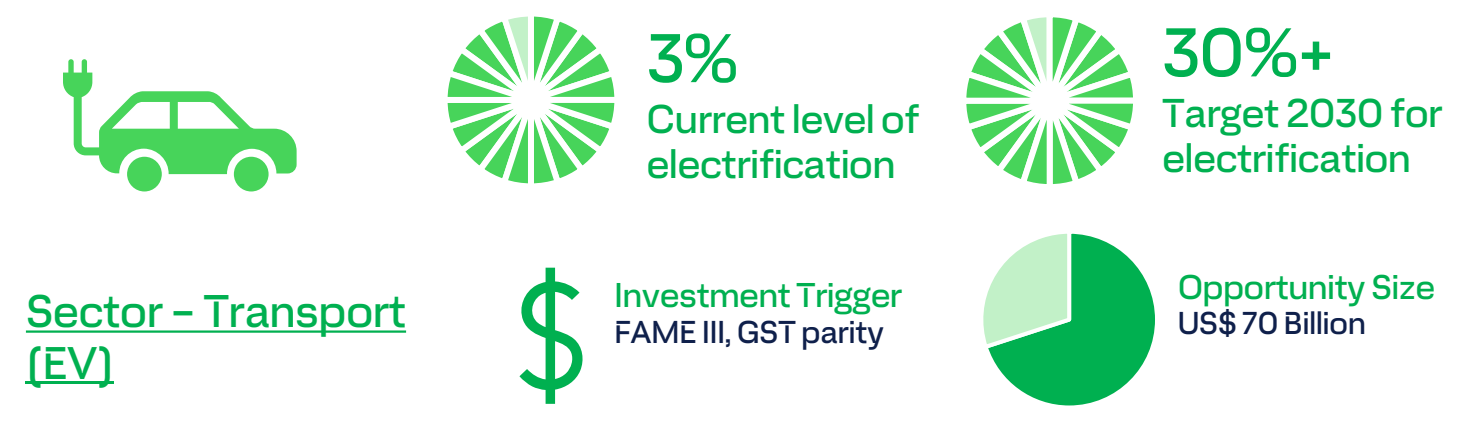
At 72% electrification, Indian industry is the largest single energy consumer in the country and the sector where the transition stakes are highest. The path to 90%+ electrification by 2030 is being shaped by two converging forces: domestic policy push and international trade pressure. The European Union's Carbon Border Adjustment Mechanism (CBAM), which begins phased implementation in 2026, is the single most consequential external demand signal for India's industrial electrification. Sectors such as steel, aluminum, cement, chemicals and fertilizers and all major export contributors face rising carbon tariff exposure on shipments to Europe unless they can demonstrate progressive decarbonization of their production processes.

For Indian manufacturers, electrification of heat, transition to green hydrogen for hard-to-abate processes, and procurement of renewable power through open access or captive routes are no longer optional sustainability gestures, they are export competitiveness imperatives. Domestically, the development of green industrial corridors under the National Industrial Corridor Development Programme is creating spatially concentrated demand for clean power, anchoring large-scale renewable procurement and attracting foreign direct investment sensitive to Scope 2 emissions disclosure requirements. **Eninrac estimates the cumulative investment opportunity in industrial electrification, energy efficiency upgrades, captive renewable assets and green hydrogen integration at approximately US\$ 85 billion through 2030 making this the single largest demand-side opportunity in India's transition landscape.**



Transport & Electric Vehicles – The US\$ 70 Billion Mobility Inflection

India's electric vehicle ecosystem sits at just 3% overall penetration today, but the trajectory is unmistakably steep. Two-wheelers and three-wheelers are already crossing commercial viability thresholds without subsidy dependence in several segments, and the policy architecture supporting the next phase of acceleration is consolidating rapidly. FAME III the third phase of the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles scheme is expected to direct substantially larger subsidy support toward commercial vehicles, public bus fleets and EV charging infrastructure, addressing the segments where total cost of ownership parity with internal combustion engine vehicles has been slowest to arrive. GST rationalization, bringing electric vehicles and charging equipment onto a level playing field with conventional vehicles, remains a critical unlock for passenger car EV adoption at the mass-market price point. The 30% EV penetration target by 2030 encompasses not just vehicle sales but the entire enabling ecosystem public and private charging networks, battery swapping infrastructure, grid reinforcement in urban and peri-urban areas, and domestic battery cell manufacturing. **Eninrac's US\$ 70 billion opportunity estimate spans vehicle manufacturing investment, charging infrastructure build-out, battery supply chain development and grid upgrade requirements attributable to EV load growth. Transport electrification also represents one of the most direct mechanisms for reducing India's petroleum import bill, which currently exceeds US\$ 130 billion annually.**



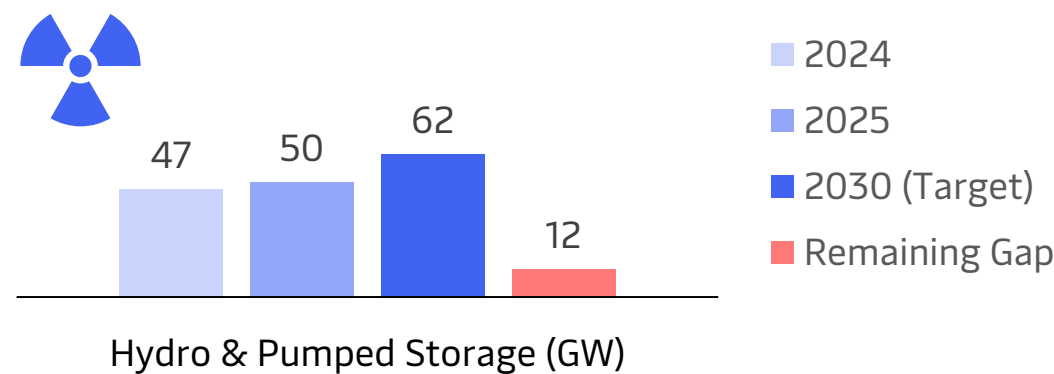
Source: eninrac consulting, eninrac analysis

India's Renewable Energy Installed Capacity vs 2030 Targets: Where Does the Gap Lie?

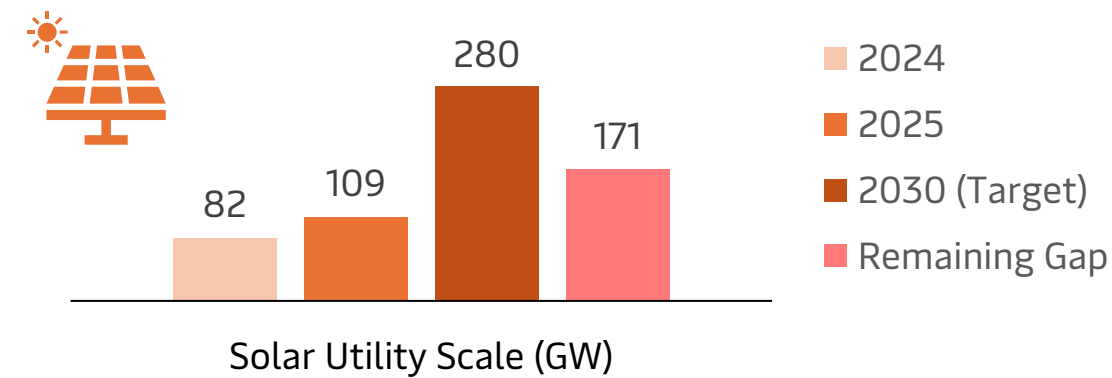
Solar Power – The Backbone of India's 2030 Energy Transition

Utility-scale solar remains the undisputed anchor of India's clean energy build-out. With 82 GW installed and a target of 280 GW by 2030, India must commission approximately 33 GW every year more than the entire installed solar base as recently as 2021. At a capital intensity of roughly US\$ 0.5 billion per GW, this translates to an annual investment requirement of approximately US\$ 16.5 billion in utility-scale solar alone. Rooftop solar, targeting 70 GW by 2030 from a current base of 20 GW, requires an additional 8 GW per year and represents a structurally different investment challenge. Unlike utility-scale procurement driven by state and central tenders, rooftop deployment depends on distributed financing, DISCOM cooperation, net metering policy stability and consumer awareness. The PM Surya Ghar Muft Bijli Yojana scheme has provided a significant demand stimulus, but execution at 8 GW per year requires a step-change in installer capacity, consumer credit access and grid interconnection infrastructure.

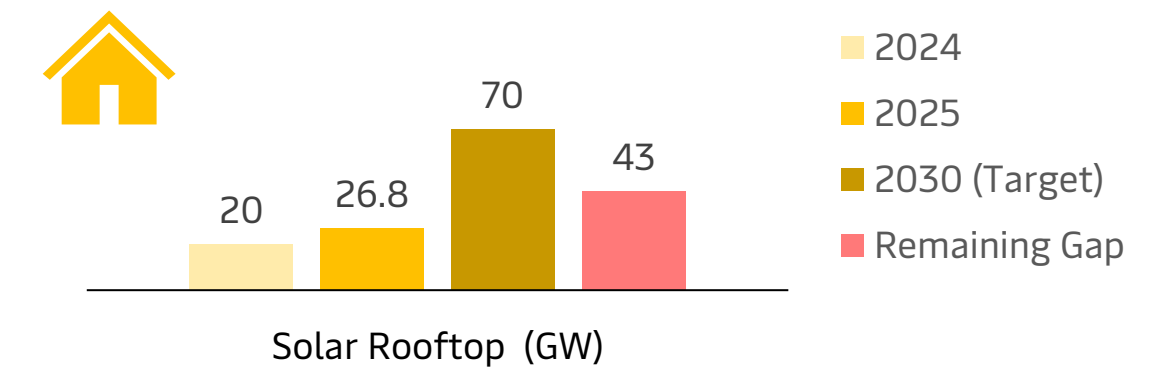
Technology – Nuclear



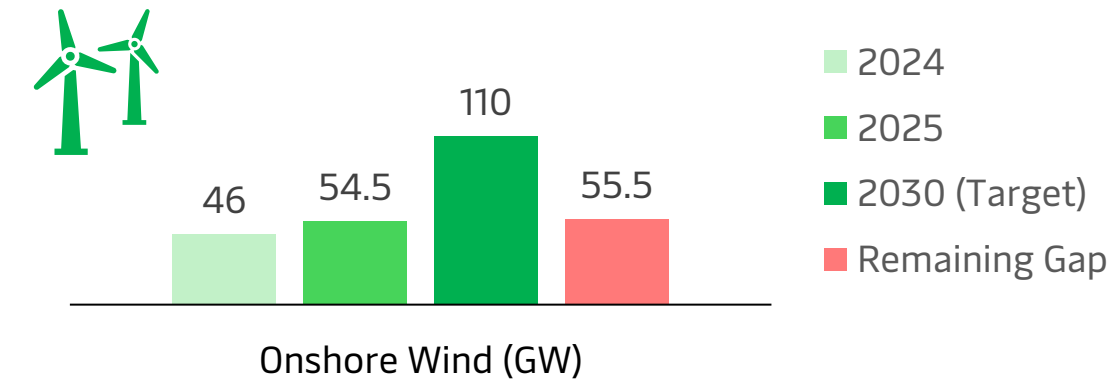
Technology – Solar Ground Mounted Utility Scale



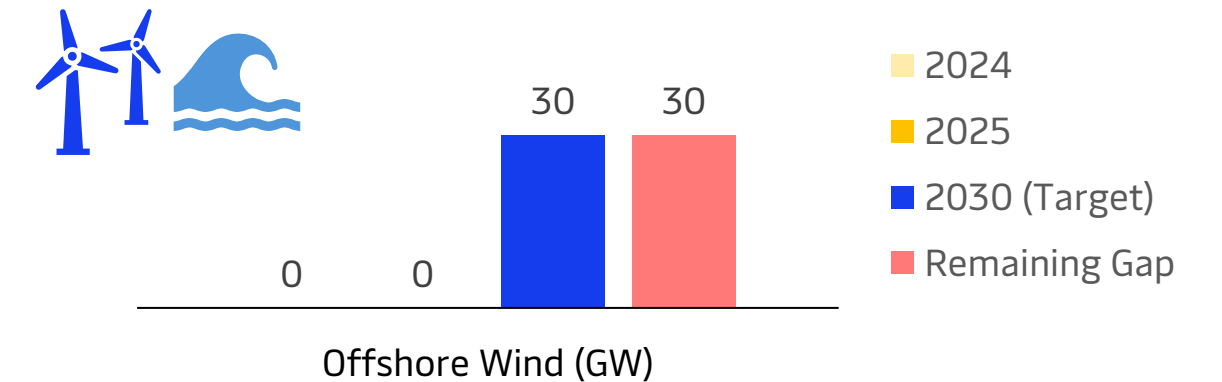
Technology – Solar Rooftop Scale



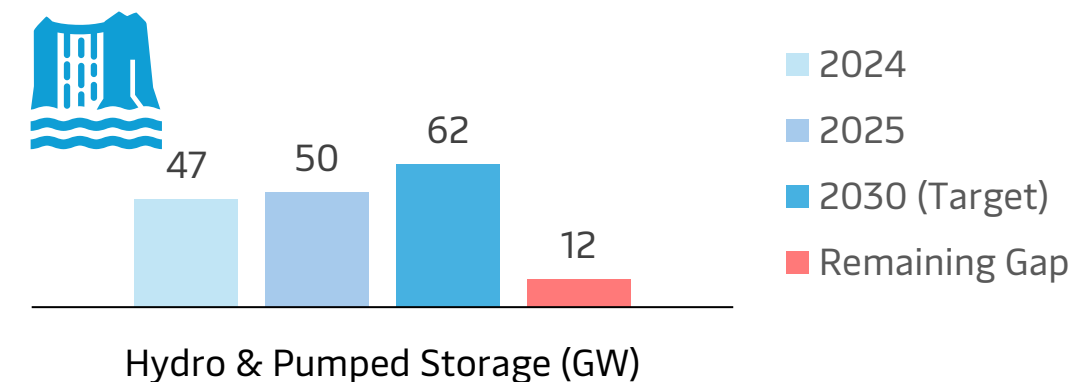
Technology – Solar Ground Mounted Utility Scale



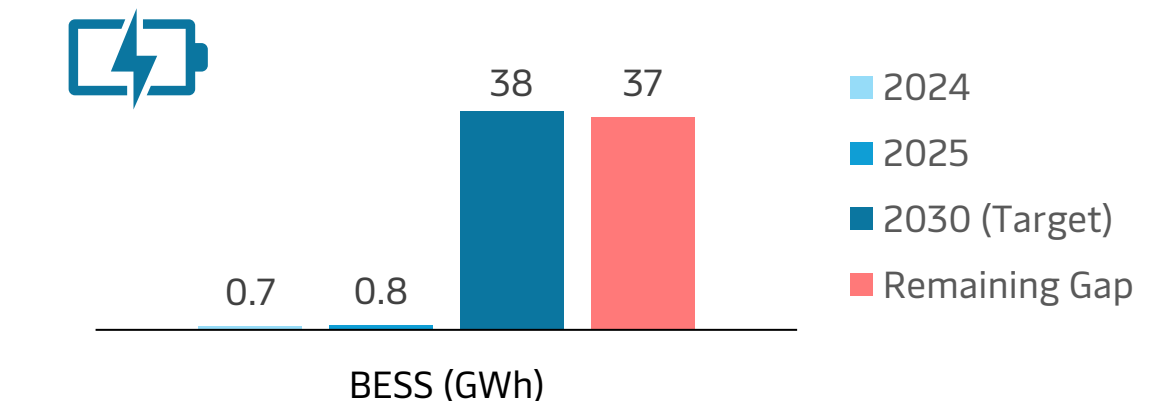
Technology – Solar Rooftop Scale



Technology – Hydro & Pumped Storage



Technology – BESS



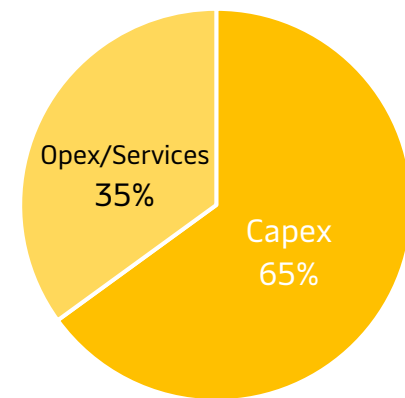
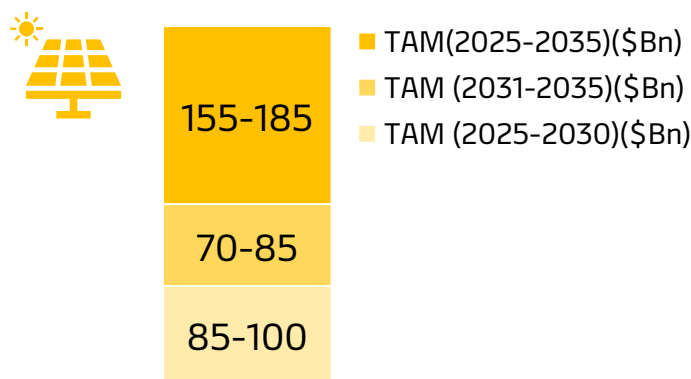
Total Addressable Market - \$500 Billion+ Investment Landscape

TAM - INVESTMENT LANDSCAPE IN ENERGY TRANSITION IN INDIA

Eninrac's dual-model framework combining bottom-up capacity build-out modelling with top-down energy expenditure decomposition delivers the market's most granular investment pool estimate across 7 primary transition sectors, 3 scenarios, and 36 states. The aggregate TAM across 2025-2035 spans US\$ 480-560 billion under base-case assumptions, with accelerated scenario potential reaching \$650B+.

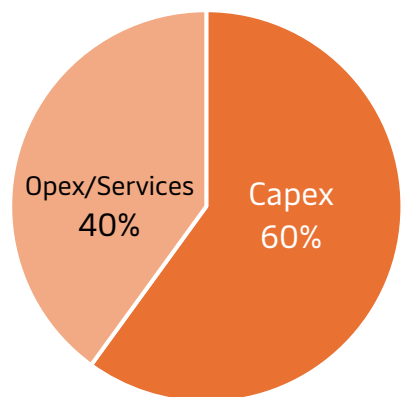
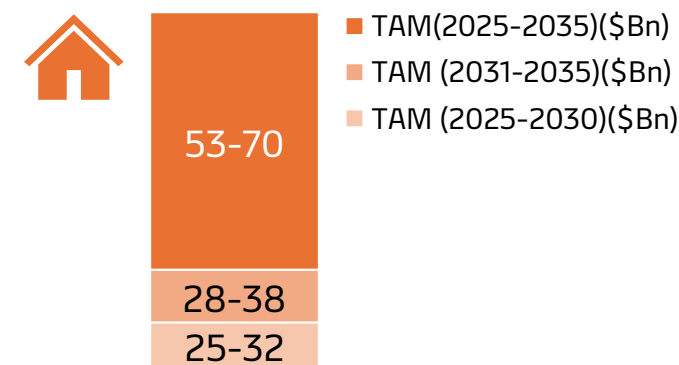
TAM - Solar Utility Scale & Rooftop Solar (2025-2035)

CAPEX-OPEX Share (%)



Utility Scale-Solar

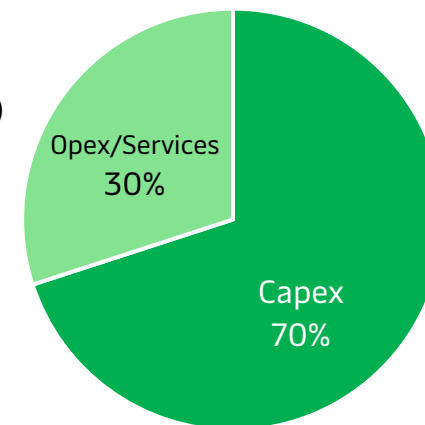
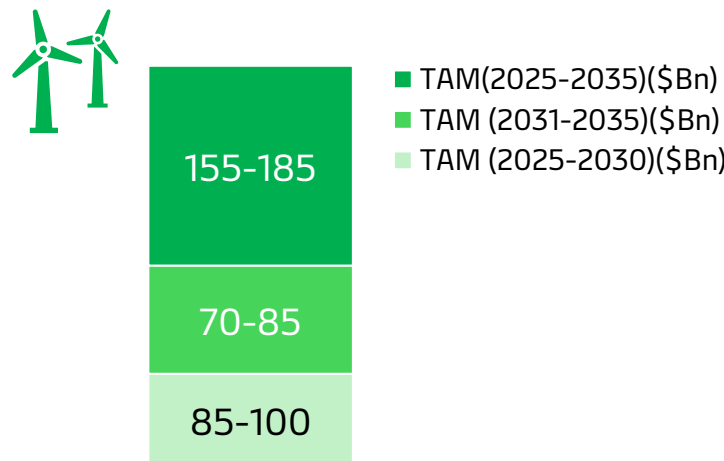
CAPEX-OPEX Share (%)



Rooftop Solar

TAM - Onshore & Offshore Wind (2025-2035)

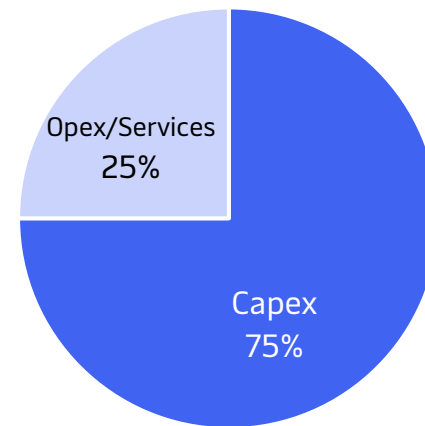
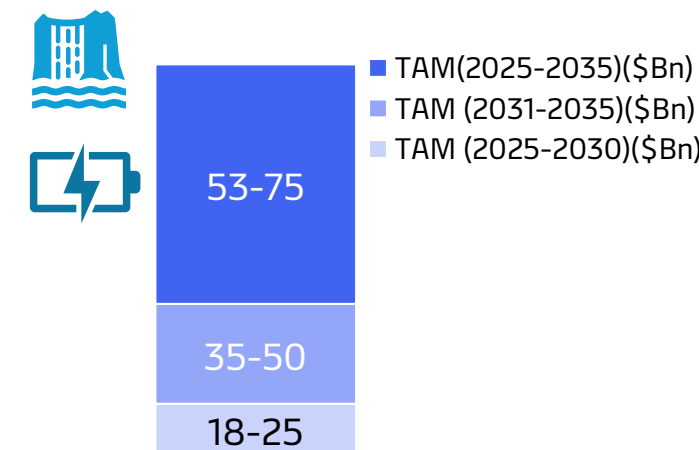
CAPEX-OPEX Share (%)



Onshore & Offshore Wind

TAM - Energy Storage (BESS+PSH) (2025-2035)

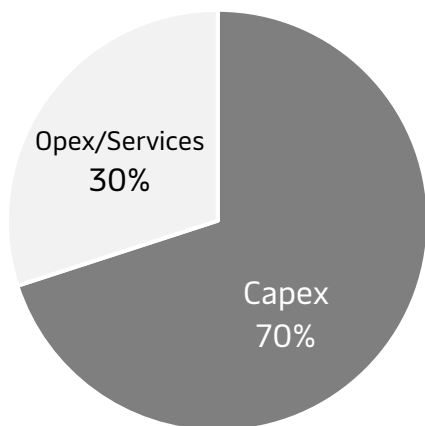
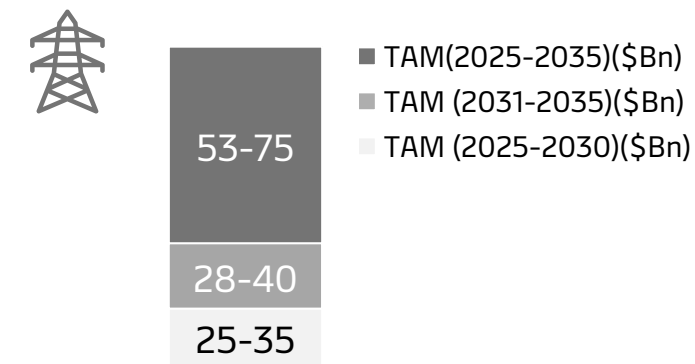
CAPEX-OPEX Share (%)



Energy Storage (BESS & PSH)

TAM - Grid Modernization T&D (2025-2035)

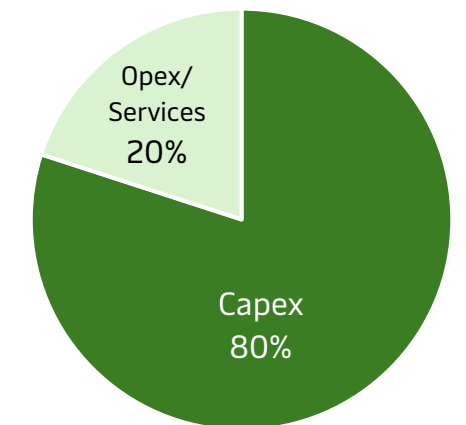
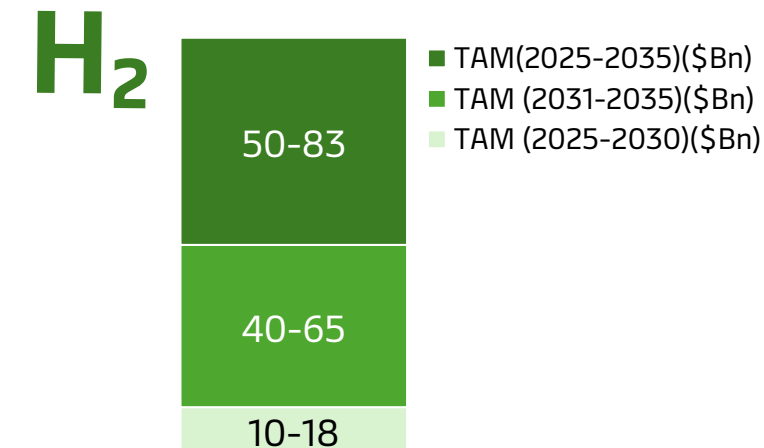
CAPEX-OPEX Share (%)



T&D

TAM - Green Hydrogen & Ammonia (2025-2035)

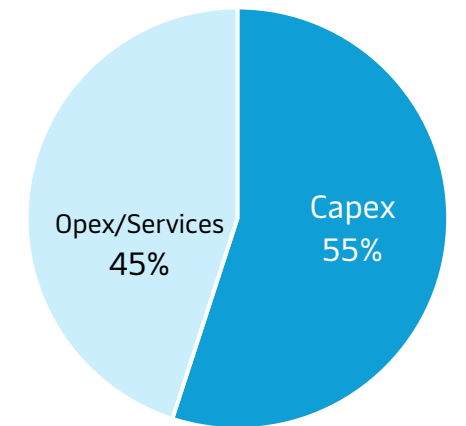
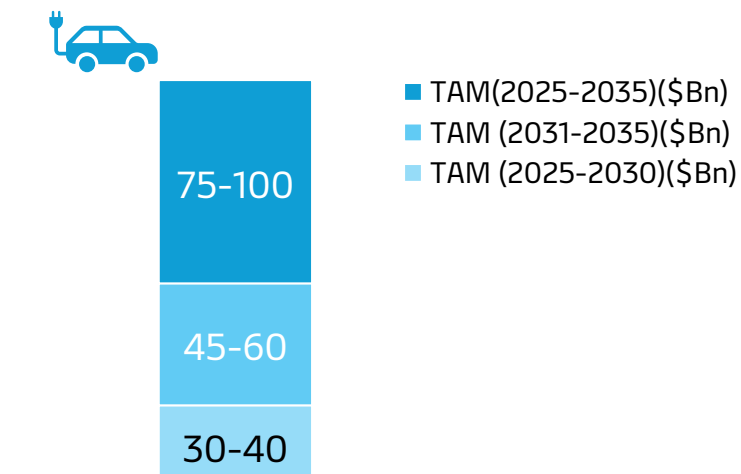
CAPEX-OPEX Share (%)



Green Hydrogen & Ammonia

TAM - EV Ecosystem (Charging Fleet) (2025-2035)

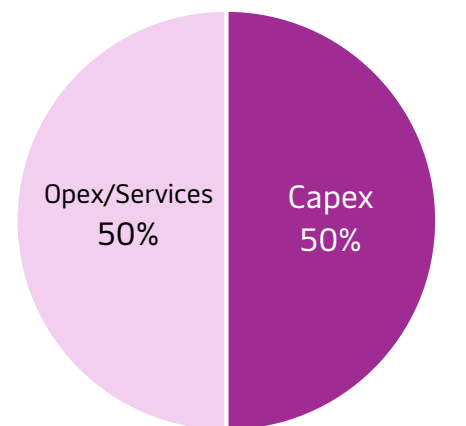
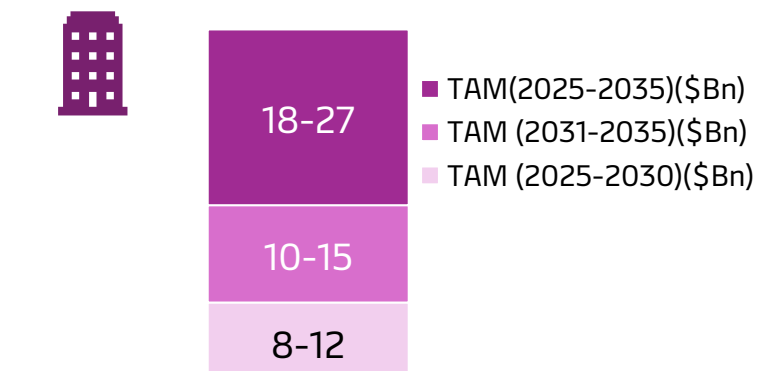
CAPEX-OPEX Share (%)



EV Ecosystem

TAM - Energy Efficiency & Buildings (2025-2035)

CAPEX-OPEX Share (%)



Energy Efficiency & Buildings

India State-Wise Energy Transition Investment Attractiveness Index 2025–2035

Why State-Level Intelligence Is the Critical Investment Input?

India's energy transition is not a national monolith, it is ten parallel transitions happening simultaneously across states with vastly different resource endowments, regulatory environments, distribution company health profiles and industrial demand structures. A solar developer's experience in Rajasthan bears little resemblance to that of a wind developer in Tamil Nadu or a green hydrogen project sponsor in Andhra Pradesh. For investors, developers, equipment manufacturers and policy architects, state-level intelligence is not a supplementary analytical layer it is the primary lens through which deployment risk, offtake certainty and return potential must be assessed. Eninrac's State Energy Transition Attractiveness Index scores ten of India's most significant energy transition states across five parameters: renewable energy resource quality, DISCOM financial health, land acquisition ease, policy support depth and grid infrastructure quality. The composite score out of 100 reflects each state's overall readiness to absorb and enable clean energy investment at scale.

Solar demand at household scale is enormous and accelerating under PM Surya Ghar.

North India – US\$ 120–145 billion TAM (2025–35)

Rajasthan, Uttar Pradesh and Haryana collectively represent the largest utility-scale solar and wind opportunity in India. Rajasthan's 50+ GW pipeline and the Khavda park anchor a region where resource quality is world-class. UP's distributed solar demand at household scale is enormous and accelerating under PM Surya Ghar. Green hydrogen production for export via Kandla and for domestic fertiliser consumption anchors the long-duration investment thesis.

East India – US\$ 65–80 billion TAM (2025–35)

The east is India's highest-upside emerging clean energy region. Coal transition economics are making renewable alternatives increasingly competitive for industrial consumers in Odisha, Jharkhand and West Bengal. Odisha's Gopalpur port and coastline anchor offshore wind and hydrogen ambitions. Bihar and Jharkhand's PM Surya Ghar uptake is strong. Industrial solar for Tata Steel, NALCO and SAIL complexes represents a near-term bankable opportunity that is currently underserved by the developer community.

State-Wise Attractiveness Scorecard for Energy Transition in India

State	Overall Score	RE Resource	DISCOM Health	Land Ease	Policy Support	Grid Quality	Key Sector Focus
Rajasthan	88	★★★★★	★★★★☆	★★★★☆	★★★★★	★★★★☆	Solar, wind, green H ₂
Gujarat	87	★★★★★	★★★★☆	★★★★☆	★★★★★	★★★★☆	Solar, wind, H ₂ export
Andhra Pradesh	84	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆	Solar, offshore, H ₂
Tamil Nadu	83	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	Wind, offshore, EV
Karnataka	82	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	Solar, wind, storage
Maharashtra	80	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★★	Solar, EV, grid mod.
Uttar Pradesh	72	★★★★☆	★★★☆☆	★★★★☆	★★★★☆	★★★★☆	Solar, PM Surya Ghar
Madhya Pradesh	70	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	Solar, pumped hydro
Odisha	68	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	Wind, H ₂ , storage
Telangana	67	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	Solar, EV, storage

Source: eninrac consulting, eninrac analysis

South India – US\$ 130–160 billion TAM (2025–35)

Rajasthan, Uttar Pradesh and Haryana collectively represent the largest utility-scale solar and wind opportunity in India. Rajasthan's 50+ GW pipeline and the Khavda park anchor a region where resource quality is world-class. UP's distributed solar demand at household scale is enormous and accelerating under PM Surya Ghar. Green hydrogen production for export via Kandla and for domestic fertiliser consumption anchors the long-duration investment thesis.

West India – US\$ 110–135 billion TAM (2025–35)

Gujarat's institutional quality and port infrastructure make it the preferred entry point for international investors new to the Indian market. GUVNL's procurement reliability, the Dholera industrial zone, and Mundra-Kandla's hydrogen export positioning collectively make Gujarat the most de-risked large-scale investment destination in India. Maharashtra adds demand side depth EV, rooftop solar and industrial decarbonisation that complements Gujarat's supply-side leadership.

Eninrac's Investment Positioning Recommendation

For investors entering or scaling in India's energy transition, Eninrac's state-level analysis yields three clear positioning principles. First, lead with Gujarat and Rajasthan for large-scale utility deployment the combination of resource quality, policy reliability and offtake depth is unmatched. Second, anchor the hydrogen and offshore thesis in Andhra Pradesh, Tamil Nadu and Gujarat, these three states have the resource, the port infrastructure and the policy frameworks to support export-oriented green molecule strategies. Third, build early positions in the east Odisha, Bihar and Jharkhand where the coal transition is creating a structural demand pull for clean energy that is not yet fully reflected in project pipelines or valuations.

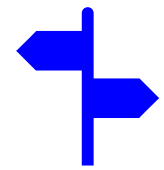
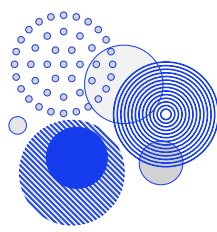
The aggregate total addressable market of US\$ 425 to US\$ 520 billion across these four regions through 2035 is not a single investable moment it is a sequenced deployment opportunity where state-specific timing, policy triggers and infrastructure readiness determine which capital deployed when will generate the strongest risk-adjusted returns.

RISK & RESTRAINT MATRIX – NAVIGATING THE BARRIERS

Risk Factor	Severity	Likelihood	States Most Affected	Mitigation Approach
DISCOM Payment Default	HIGH	MEDIUM	UP, RJ, HR, MP, CG	Escrow, LCGF, tripartite PPA
Land Acquisition Delays	HIGH	HIGH	All states	Land banks, land pooling policy
ALMM Compliance Risk	MEDIUM	HIGH	OEM-dependent developers	PLI-aligned domestic supply
Grid Curtailment	HIGH	MEDIUM	TN, AP, RJ (RE-rich)	Storage co-location, HVDC
Skilled Workforce Gap	MEDIUM	HIGH	Tier-2/3 geographies	NSDC tie-ups, RE skill India
INR Depreciation	MEDIUM	MEDIUM	All FDI-heavy projects	ECB hedging, NDF instruments
Critical Mineral Shortage	HIGH	MEDIUM	BESS, EV, H ₂ sectors	Domestic mining, recycling
Policy Reversal Risk	LOW	LOW	All	Bilateral treaty protection

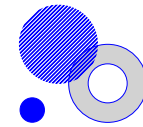
Regional Investment Opportunity Highlights – India

<p> NORTH INDIA (Rajasthan, UP, Haryana)</p> <p>TAM 2025–35: \$120–145B Rajasthan alone hosts >50GW pipeline. Khavda Ultra Mega Renewable Energy Park (30GW), Bikaner-Jaisalmer solar belt, green hydrogen export via Kandla port. UP offers PM Surya Ghar upside across 60M households.</p>	<p> SOUTH INDIA (TN, AP, KA, Telangana)</p> <p>TAM 2025–35: \$130–160B Tamil Nadu leads offshore wind (4GW corridor), AP hosts India's largest green H₂ project pipeline. Karnataka is India's most mature RE market with over 22GW installed. High-quality resource + industrial offtake creates natural investment gravity.</p>
<p> WEST INDIA (Gujarat, Maharashtra, Goa)</p> <p>TAM 2025–35: \$110–135B Gujarat leads India on DISCOM health and FDI facilitation. GUVNL remains India's most active state offtake authority. Maharashtra drives EV and rooftop solar demand. Mundra/Kandla as green H₂ export hubs.</p>	<p> EAST INDIA (Odisha, WB, Jharkhand, Bihar)</p> <p>TAM 2025–35: \$65-80B Emerging opportunity as coal transition drives RE demand. Odisha's coastline and Gopalpur port for offshore wind anchoring. Bihar and Jharkhand show strong PM Surya Ghar uptake. Industrial solar for Tata Steel, NALCO, and SAIL complexes.</p>



KEY SIGNPOSTS – INDIA ENERGY TRANSITION OUTLOOK 2026-2035

- 01** Policy catalyst: SIGHT 2.0 as the commercial trigger Revised SIGHT 2.0 incentives - targeting 5 MMT annual production by 2030 and are poised to de-risk the first wave of bankable projects across fertilizer, refining & steel
- 02** Capacity milestone: India crosses 500 GW RE installed capacity 500 GW crossed. Non-fossil threshold breached ahead of COP26 commitment, 33 GW/yr solar utility scale run-rate confirmed.
- 03** Manufacturing inflection: PLI-driven domestic solar and battery cell production reaches commercial scale PLI delivers. Domestic solar and battery cell production reaches commercial volume, compressing project capex.
- 04** Demand trigger: CBAM enforcement activates industrial decarbonization investment at scale CBAM kicks in. EU carbon border enforcement activates USD 85 Bn industrial decarbonization investment cycle.
- 05** Grid signal: Round-the-clock renewable procurement tenders establish storage as a bankable asset class RTC tender's win. Round-the-clock bundled procurement makes BESS and pumped hydro bankable asset classes.
- 06** Geopolitical signal: India formalizes green hydrogen export corridors with Japan, South Korea and the EU H₂ deals signed. India–Japan, Korea and EU green hydrogen corridors lock in USD 31.5 Bn export opportunity.



Must Buy For

- **Renewable Energy Developers & IPPs**
Domestic: Adani Green Energy, Greenko Group, ReNew Power, Torrent Power, Acme Solar, Amp Energy, O₂ Power, Avaada Energy, Ayana Renewable Power, Sprng Energy, Hero Future Energies, Continuum Green Energy, Orix Green Energy, Sekura Energy, Azure Power, Hinduja Renewables etc.
International: Total Energies, EDF Renewables, Shell Energy, Engie, Lightsource BP, Masdar, ACWA Power, Sembcorp, Mainstream Renewable Power etc.
- **Green Hydrogen Producers & Project Developers**
Domestic: Reliance Industries, Adani New Industries, NTPC Green Hydrogen, Indian Oil Corporation, HPCL, BPCL, GAIL, JSW Energy, Torrent Group, Greenko ZeroC, ACC Green Hydrogen, L&T Green Hydrogen etc.
International: Fortescue Future Industries, Hyundai, Air Liquide, Linde, Air Products, Siemens Energy, ThyssenKrupp Nucera, Plug Power, Nel Hydrogen, ITM Power
- **Electrolyzer Manufacturers & Technology Providers**
Domestic: BHEL, Thermax, John Cockerill India, Ohmium India, KPIT Technologies, Waaree Energies etc.
International: Nel ASA, ITM Power, Plug Power, Cummins, Siemens Energy, ThyssenKrupp Nucera, Bloom Energy, McPhy Energy, Cockerill Jingli Hydrogen etc.
- **Solar Equipment Manufacturers**
Domestic: Modules & Cells Waaree Energies, Adani Solar, Vikram Solar, Jinko Solar India, Tata Power Solar, Premier Energies, ReneSola, Goldi Solar, Saatvik Solar, Websol Energy **Inverters & BOS** Solaredge India, Sungrow India, SMA Solar India, Havells, Schneider Electric India, ABB India etc.
International: Longi Green Energy, JA Solar, Trina Solar, Canadian Solar, First Solar, Jinko Solar etc.
- **Wind Turbine Manufacturers & Component Suppliers**
Domestic: Suzlon Energy, Inox Wind, Windworld, Regen Powertech etc.
International: Vestas India, Siemens Gamesa India, GE Vernova, Envision Energy, Goldwind, Senvion etc.
Component & Tower Suppliers Pennar Industries, KEC International, Skipper Limited, Trinity Blades, Sabre Industries etc.
- **Battery Storage & BESS Manufacturers**
Domestic: Amara Raja Energy & Mobility, Exide Industries, Tata Chemicals, Waaree ESS, Greenfuel Energy, Loom Solar, Panasonic Energy India, HBL Power Systems, BYD India etc.
International: CATL, BYD, LG Energy Solution, Samsung SDI, Fluence Energy, Tesla Energy, Wärtsilä, Saft, Hitachi Energy etc.



Companies Mentioned

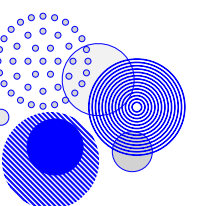
- Avaada H₂
- ReNew Green Hydrogen
- Adani TotalEnergies
- ACME
- Greenko
- NTPC Green
- Thermax
- BHEL
- Ohmium
- 24M
- Nel
- ITM Power
- Cummins
- Siemens Energy India
- IFFCO
- NFL
- HPCL
- IOCL
- BPCL
- JSW Steel
- Nel ASA
- ITM Power
- Plug Power
- Cummins
- Siemens Energy
- ThyssenKrupp Nucera
- Bloom Energy
- McPhy Energy
- Cockerill
- Jingli Hydrogen
- Fortescue Future Industries
- Hyundai
- Air Liquide
- Linde
- Air Products
- CATL
- BYD
- Lg Energy Solution
- Fluence Energy
- Waaree Energies
- Adani Solar
- Vikram Solar
- Jinko Solar India
- Tata Power Solar
- Premier Energies
- ReneSolar
- Goldi Solar
- Saatvik Solar
- Websol Energy
- Solaredge India
- Sungrow India
- SMA Solar India
- Havells
- Schneider Electric India
- ABB India
- Pennar Industries
- KEC International
- Skipper Limited
- Trinity Blades
- Sabre Industries



For Queries

Research : Write to: connect@eninrac.com and alternatively you may reach our team at nsharma@eninrac.com

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About Eninrac

Eninrac Consulting is a global market research and advisory firm that specializes in providing comprehensive insights and strategic solutions across various industries. Our services are designed to help businesses navigate market complexities, identify growth opportunities, and achieve sustainable success.

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.

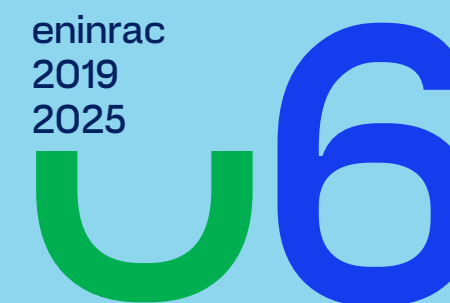
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2025 marks our 6th
anniversary as a performance
leader, delivering superior
research and advisory services.