Crisil
Intelligence

Sembcorp Green Infra Limited

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Assessment of Indian power and renewable energy market

Final Report

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1.1 Macroeconomic overview - a foundation for India's economic expansion

India's macroeconomic landscape has been defined by robust growth, resilience, and reform. Over the past several years, the country has weathered global disruptions from the pandemic to geopolitical tensions while maintaining its status as the world's fastest-growing major economy. This momentum is underpinned by structural reforms, sustained infrastructure investment, and rapid digitalisation, all of which have strengthened India's economic fundamentals and positioned it for continued expansion. This combination is significant for the power/ renewable energy sector because it shapes the pace and profile of electricity demand, the health of offtakers across the economy, and the availability and cost of capital for long-gestation infrastructure. In short, India's growth momentum is not only a headline statistic, but also the underlying driver of the next phase of power capacity addition and grid investment.

Sustained GDP growth - powering the next decade of energy demand

Over Fiscal 2018–2026, India has steadily reinforced its position as the fastest-growing major economy, demonstrating resilience through the pandemic, geopolitical shocks, and external trade disruptions. Structural reforms sustained public investment in infrastructure, and rapid digitalisation have supported this trajectory. With the rebasing of national accounts to Fiscal 2022–23, Ministry of Statistics and Program Implementation (MoSPI) estimate real GDP at INR 280.00 trillion in Fiscal 2024, INR 299.89 trillion in Fiscal 2025, and INR 323.12 trillion in Fiscal 2026, implying 7.7% growth in Fiscal 2026 (up from 7.1% in Fiscal 2025). The composition of growth remains important as an economy driven by domestic consumption tends to be more resilient to external shocks and provides a steadier foundation for infrastructure and industrial demand.

India's Global Ascent - scale brings capital, competition, and higher expectations

As per International Monetary Fund's World Economic Outlook report of April 2026, India ranks as the world's sixth largest economy. India's growth is now translating into a step-change in global economic positioning. The IMF projects India to become the fourth-largest economy by nominal GDP in Fiscal 2027, overtaking Japan and UK and expects growth of 7.7% in Fiscal 2026 and 6.4% in Fiscal 2027 among the highest in the top 10 economies. India is also projected to become the third-largest economy by Fiscal 2031, overtaking Germany. This rise matters in practical terms as India scales, it attracts deeper pools of capital and supply-chain investment, but it also faces higher expectations on infrastructure quality, cost competitiveness, and reliability areas where power availability becomes a key enabling condition.

Table 1: India's GDP growth projections by different agencies for Fiscal 2027

Agency	Growth Rate
Reserve Bank of India (RBI)	6.6%
Asian Development Bank (ADB)	7.3%
S&P Global	6.1%
IMF	6.4%
World Bank	6.6%
Average	**6.66**

Average is the average of above 5 agencies;

Source: Websites of respective Agency; Crisil Intelligence

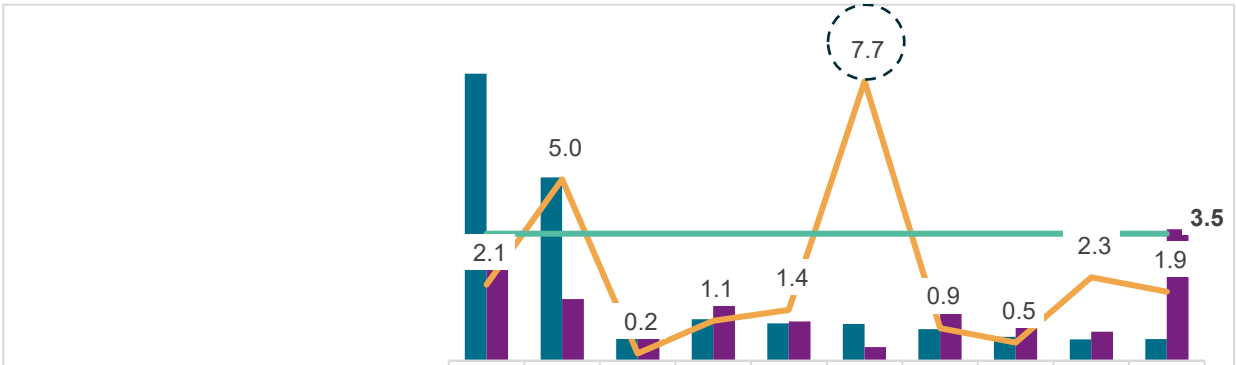
Global agencies have lowered their GDP growth projections for India for Fiscal 2027 from earlier estimates, citing continued disruptions to energy flows amid the Middle East conflict that are weighing on energy prices, trade, and investment. Even with the expected slowdown, India is still expected to remain one of the fastest-growing major economies globally.

Outpacing peers - domestic demand and manufacturing drive power sector expansion

India, in Fiscal 2026 is projected to grow at more than double the world average, moderating to around 6.5% thereafter. Most agencies cluster around a 7% ± 0.5% view for Fiscal 2026, signalling broad-based confidence in the growth trajectory. This is underpinned by domestic demand, continued formalisation, and rising consumption from an expanding middle class. For the broader economy, this creates a virtuous cycle where higher consumption supports private sector revenues, which supports investment, employment, and tax buoyancy reinforcing the Fiscal capacity to invest in infrastructure.

As economic activity expands, it also fuels higher electricity demand through rapid industrialization, urbanization, manufacturing growth and rising household consumption. Given the strong historical correlation between India's GDP and power demand sustained economic expansion is expected to translate into robust growth in electricity consumption, creating a strong demand outlook for the power sector.

Figure 1: Comparison of India's economy with other major nations



	US	China	Germany	Japan	UK	India*	France	Italy	Brazil	Canada
Nominal GDP (Tn USD) CY25	30.77	19.63	5.05	4.44	4.00	3.92	3.37	2.55	2.28	2.32
Per capita electricity consumption 2024 (MWh)	12.9	6.6	6.1	7.5	4.2	1.5	6.5	5.1	3.1	14.1
Real GDP Growth CY25 (in %)	2.1	5.0	0.2	1.1	1.4	7.7	0.9	0.5	2.3	1.9
Global Growth (%) CY25	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

**India GDP growth as per NSO for Financial Year 2026,*

Source: World Economic Outlook (WEO) Database (April 2026) by IMF; IEA, CEA, Crisil Intelligence

Navigating external risks - global trends and their impact on India's energy security

The external backdrop remains supportive but not without risk. The IMF's July 2026 WEO expects global growth to remain at 3.0% in CY2026 and 3.4% in CY2027. However, uncertainties around global demand, the persistence of protectionist measures, and geopolitical volatility remain key monitorables. For India, the macro implication is straightforward: while the baseline supports exports and investment flows, the risk scenario can transmit through commodity prices, trade channels, and financial conditions making macro buffers and policy flexibility important.

Table 2: Real GDP annual growth forecast of major economies (figures in %)

Country	CY25(A)	CY26(E)	CY27(P)	CY28(P)	CY29(P)	CY30(P)	CY31(P)
Brazil	2.3	2.4	2.2	2.4	2.5	2.5	2.5
Canada	1.9	1.1	1.7	1.7	1.7	1.7	1.8
China	5.0	4.6	4.1	4.0	3.7	3.3	3.3
France	0.9	0.6	0.9	1.2	1.2	1.1	1.1
Germany	0.2	0.7	1.0	1.2	0.9	0.7	0.6
India*	7.7	6.4	6.7	6.5	6.5	6.5	6.5
Italy	0.5	0.5	0.5	0.8	0.7	0.7	0.7
Japan	1.1	0.6	0.7	0.6	0.6	0.6	0.6
United Kingdom	1.4	1.0	1.3	1.6	1.6	1.5	1.4
United States	2.1	2.3	2.2	2.1	1.9	1.8	1.8
World	3.5	3.0	3.4	3.2	3.2	3.1	3.1

**For India financial Year (April-March) CY 25 is Fiscal 2026; CY26 and CY27 projections are as per IMF's July 2026 WEO and from CY28-CY31 are as per IMF's April 2026 WEO*

E: Estimated based on latest available information for the Fiscal; P: Projected;

Source: IMF's World Economic Outlook Database (July 2026 and April 2026) by IMF; Crisil Intelligence

1.2 Macro trajectory: growth holds, while the inflation cycle turns

Looking ahead, Crisil Intelligence forecasts India's real GDP growth at 6.6% in Fiscal 2027, reflecting the impact of elevated energy prices, supply-chain disruptions and global uncertainties linked to the conflict in West Asia. Despite these headwinds, domestic demand is expected to remain supportive, led by robust private consumption and a mild pickup in private investment. Policy support through tax and GST measures, state-level cash transfers, lower interest rates, and benign inflation are expected to support demand conditions into Fiscal 2027. SBI 1-year marginal cost lending rates (MCLR) for the March month end of 2024, 2025 and 2026 were 8.65%, 9.00% and 8.70% respectively. With the West Asia conflict prolonged beyond April 2026 and energy prices remaining elevated, the Indian Rupee (INR) breached the 96 mark against the US Dollar (USD) in May 2026, hitting record lows due to intense volatility from geopolitical tensions and rising energy prices. Crisil Intelligence projects average CPI inflation rising from an estimated 2.0% in Fiscal 2026 to ~5.1% in Fiscal 2027. The below-normal monsoon rainfall expected amid El Niño conditions and the ongoing heatwaves can hurt agricultural production and exert pressure on food inflation, which is normalising from its lows. India is moving into a phase where growth remains resilient, but macro management becomes more finely balanced as inflation normalises.

Table 3: Crisil's key projections for India

	Fiscal 2020	Fiscal 2021	Fiscal 2022	Fiscal 2023	Fiscal 2024	Fiscal 2025	Fiscal 2026	Fiscal 2027P
GDP growth (%)	3.90%	-5.80%	9.70%	7.60%	7.20%	7.10%	7.70%	6.60%
CPI (%, average)	4.80%	6.20%	5.50%	6.70%	5.40%	4.60%	2.00%	5.10%
CAD/GDP (%)	0.90%	-0.90%	-1.20%	-2.00%	-0.70%	-0.60%	-0.60%	-2.20%
FAD/GDP (%)	4.60%	9.20%	6.70%	6.40%	5.60%	4.80%	4.40%	4.30%
Exchange rate (INR /USD March-end*)	75.39	73.50	75.81	82.22	83.37	85.58	94.65	93.50
10-year G-sec yield (%, March-end)	6.20%	6.20%	6.80%	7.40%	7.10%	6.70%	6.70%	7.00%

*P: Projected; CPI: Consumer Price Index-linked; CAD: Current account deficit; G-sec: Government security; FAD: Fiscal account deficit; *As on last working day of financial year.*

Source: CSO, RBI, Crisil Intelligence

Capex and industrial upswing - infrastructure and manufacturing as growth multipliers

A defining feature of India's current cycle is the breadth of the investment push. Crisil Intelligence expects the investment upcycle to continue, with private capex recovering, especially in sectors benefiting from policy incentives and trade agreements alongside an ongoing central government thrust on capital expenditure. Budgetary/effective capex is projected to grow 22.1% in Fiscal 2027, compared with 6% in the revised estimates for Fiscal 2026, reinforcing infrastructure-led growth.

In parallel, India's manufacturing ambition is strengthening. Policy initiatives such as Make in India and the National Infrastructure Pipeline, together with logistics upgrades (freight corridors, ports, highways, rail), are improving competitiveness and enabling scale. Manufacturing contributes around 17–18% of GDP today, with the government's ambition to rise toward 23–25% by 2047. This shift is economically meaningful: manufacturing typically carries higher multipliers for jobs, exports, and productivity, and it increases demand for dependable infrastructure particularly transport, urban services, and power.

External balance, currency, and oil sensitivity - macro stability still intact

Crisil Intelligence projects the current account deficit at 0.6% of GDP in Fiscal 2026, rising to 2.2% in Fiscal 2027 levels. A healthy services trade surplus keeps CAD manageable. This is important because it anchors macro stability and limits the risk of disruptive external financing needs. The outlook assumes benign crude oil prices; any sustained oil shock would be transmitted quickly through the trade balance, inflation, and currency.

The rupee weakened in March 2026 amid geopolitical tensions and higher energy prices. With a manageable CAD and stable fundamentals, the currency is expected to remain broadly range-bound, with movements driven primarily by global risk sentiment, oil prices, and portfolio flows. For infrastructure-heavy sectors, the broader implication is that macro stability reduces the probability of abrupt financing shocks, even if short-term volatility persists.

Policy credibility and the cost of capital - ratings, rates, and long-end conditions

India's investment-grade sovereign profile and stable outlook supports market confidence and help contain risk premia in domestic bond markets. This matters for long-duration infrastructure because small changes in long-end yields materially affect project economics and investment appetite. On monetary policy, the RBI's MPC kept the repo rate unchanged at 5.25% in June 2026, maintaining a neutral stance and signalling data dependence. With inflation expected to rise in Fiscal 2027 but growth remaining robust, Crisil Intelligence expects a broadly steady policy stance through Fiscal 2027.

Rating agency	Rating in	Rating (Outlook)
R&I (Japan)	September 2025	BBB+ (Stable)
S&P Global	August 2025	BBB (Stable)
Morningstar DBRS	May 2025	BBB (Stable)
Moody's	February 2026	Baa3 (Stable)
Fitch Ratings	August 2025	BBB- (Stable)

Crisil Intelligence projects the 10-year G-sec yield to moderate slightly to 7.0% by March 2027 from 6.7% in March 2026, majorly due to rising inflation, a moderating liquidity surplus and Fiscal concerns. The key takeaway is that financing conditions remain broadly supportive, but the trajectory will be sensitive to inflation outcomes, crude prices, Fiscal arithmetic, and foreign portfolio flows.

Budget and trade - strengthening the domestic base while deepening integration

Recent policy developments reinforce India's growth model build domestic capacity, crowd in private investment, and expand market access. The Union Budget 2026–27 continues the emphasis on infrastructure-led growth and industrial competitiveness, including measures aimed at supply chain resilience and targeted incentives for priority sectors. Alongside this, India's trade engagements in 2026 including progress with major partners such as the US and EU and continued expansion of preferential arrangements signal an effort to diversify markets, strengthen supply chains, and attract investment tied to manufacturing and services expansion. The macro relevance is that stronger trade integration, if executed well, supports exports, technology inflows, and productivity gains while also raising the premium on domestic infrastructure readiness.

Outlook for Fiscal 2027 - a strong economy, and a clear infrastructure imperative

India enters Fiscal 2027 with one of the strongest growth outlooks among major economies, supported by domestic demand, a sustained capex cycle, and industrial expansion. The near-term macro watchpoints are clear monsoon outcomes, crude oil prices, global risk sentiment, and the inflation normalisation path but the base case remains constructive.

For the power sector, the implication of this macro trajectory is straightforward as a larger economy with a rising industrial base and accelerating infrastructure build-out will require a step-up in reliable electricity supply and network capacity. India's economic momentum is creating a structural requirement for sustained investment in power generation, transmission, and system flexibility making the coming years a pivotal period for capacity addition and grid strengthening.

From resilient growth and rising global stature to an industrial resurgence, supportive policy, and transformative trade deals, India's story through Fiscal 2027 is one of momentum and structural change. The confluence of manufacturing expansion and a clean-energy pivot positions India not only to grow faster than its peers, but to do so in a way that reshapes its economic model for the long term.

Key Takeaways

- **Sustained High Growth:** India is expected to be the fastest-growing major economy in Fiscal 2027, propelled by robust domestic consumption, structural reforms, and rising investments in infrastructure and industry, despite ongoing geopolitical tensions.
- **Manufacturing Push:** Government initiatives such as Make in India and Production Linked Incentive (PLI) schemes are strengthening domestic manufacturing capabilities and increasing India's participation in global supply chains.
- **Expanding Investment Opportunities:** Ongoing economic growth and rising energy demand are expected to create significant long-term investment prospects in power generation, transmission networks, and supporting infrastructure.
- **Deepening Global Integration:** Recent trade agreements are reshaping India's global economic engagement, broadening market access, and strengthening international partnerships.

2 Overview of Indian power sector

2.1 Operating and regulatory structure

Governance framework - a shared mandate between the Centre and States

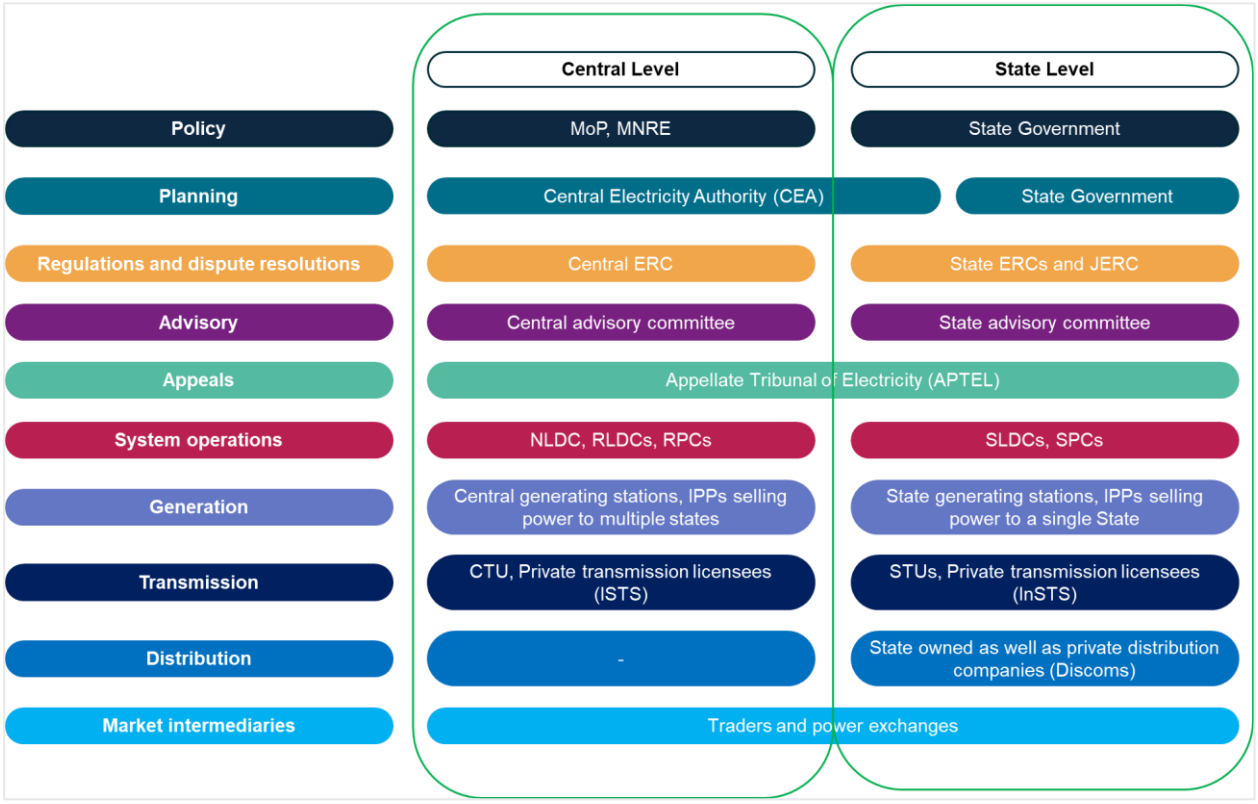
India's power sector operates under a collaborative governance framework, with electricity designated as a concurrent subject under the Constitution of India, whereby both the Central and the State have roles to play. The Central Government sets national policy and planning standards, while state governments oversee implementation, land allocation, and offtake arrangements through their distribution companies (DISCOMs). The Central Electricity Authority (CEA) plays a pivotal role in long-term planning, advising the government on policy matters, and setting technical standards for the development and regulation of the power sector, formulating national electricity plans that guides capacity additions and resource adequacy.

To regulate electricity sector and strengthen sector discipline, India has established the Central Electricity Regulatory Commission (CERC). At the state level, State Electricity Regulatory Commissions (SERCs) have been set up by respective state governments. Together, these institutions are intended to regulate tariffs and market behaviour, encourage competition, and facilitate private investment, while ensuring that sector development aligns with policy priorities.

Roles across the value chain - states drive implementation; the centre enables scale and consistency

State governments have a major role in the creation of generation capacity through state generation companies, and in overseeing state-level transmission and distribution. The Central Government frames the national electricity policy, the national electricity plan, and other rules, guidelines, and schemes, typically in consultation with various stakeholders including states and the CEA.

Figure 2: Institutional and structural framework



Note: MoP: Ministry of Power, MNRE: Ministry of New and Renewable Energy; ERC: Electricity Regulatory Commission, JERC: Joint Electricity Regulatory Commission, NLDC: National Load Despatch Centre, RLDC- Regional Load Despatch Centre, RPC: Regional Power Committee, SLDC- State Load Despatch Centre, SPC: State Power Committee, IPP: Independent Power Producer, CTU- Central Transmission Utility; ISTS: Inter State Transmission System, STU- State Transmission Utility, InSTS: Intra State Transmission System

Source: Crisil Intelligence

India's power sector is designed to accelerate development while ensuring that electricity supply reaches all areas, consumer and stakeholder interests are protected, and planning reflects critical factors such as resource availability, technology options, generation economics, and energy security considerations. This Centre–State design is central to understanding about India's scales capacity and reforms in the sector, providing the institutional backbone for the transition to a larger, more reliable, and increasingly cleaner power system.

2.2 Power demand in India

India is now among the top global power markets and renewables are central to that story

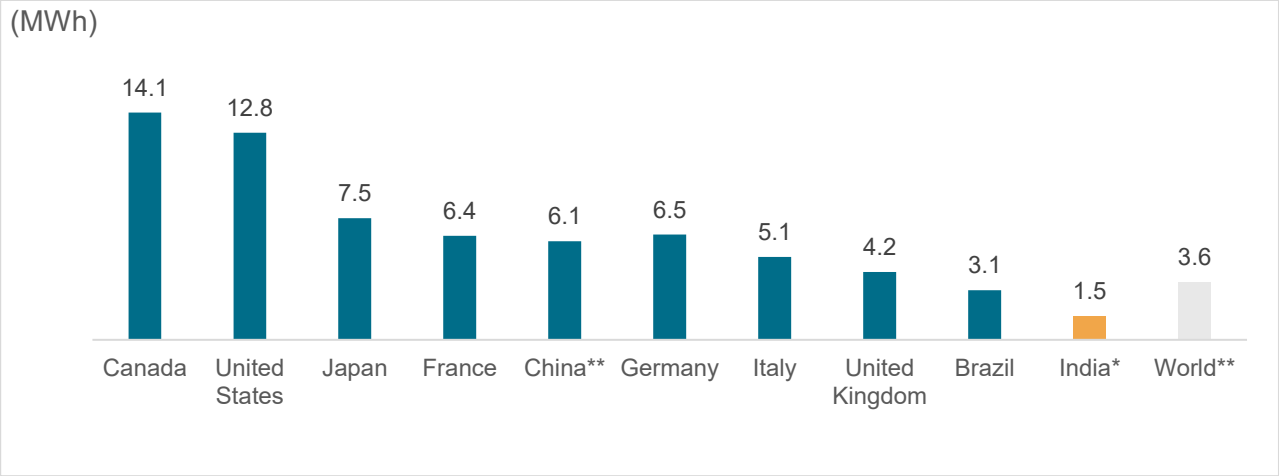
India is the third largest producer and consumer of electricity globally with capacity expected to reach over 800 GW by 2030. Since liberalisation, India's total power generation capacity increased at a CAGR of ~5.9% to ~533 GW as of March 2026 from 63.6 GW in March 1990 whereas total generation increased at a CAGR of ~5.4% to 1,709 BUs during Fiscal 2026 from 245.4 BUs during Fiscal 1990.

Low per capita consumption in India – witnessing growth

India's per-capita electricity consumption has shown a steady increase over the past decade, rising from 1,010 kWh in Fiscal 2015 to 1,460 kWh in Fiscal 2025 (provisional), which reflects a CAGR of 3.7%. This growth was largely driven by expanding economic activity, greater domestic consumption, and ongoing

efforts to electrify rural and household sectors. India's per capita electricity consumption (kWh) is one of the lowest in the world. This persistent gap is a strong signal that electricity demand can compound well beyond the forecast period, supported by ongoing economic expansion and a structurally more electricity-intensive energy system as electrification deepens across transport (EVs), rail, and increasing industrial processes all occurring in a world where overall electricity demand is already on an upward trajectory.

Figure 3: Per capita electricity consumption compared with world

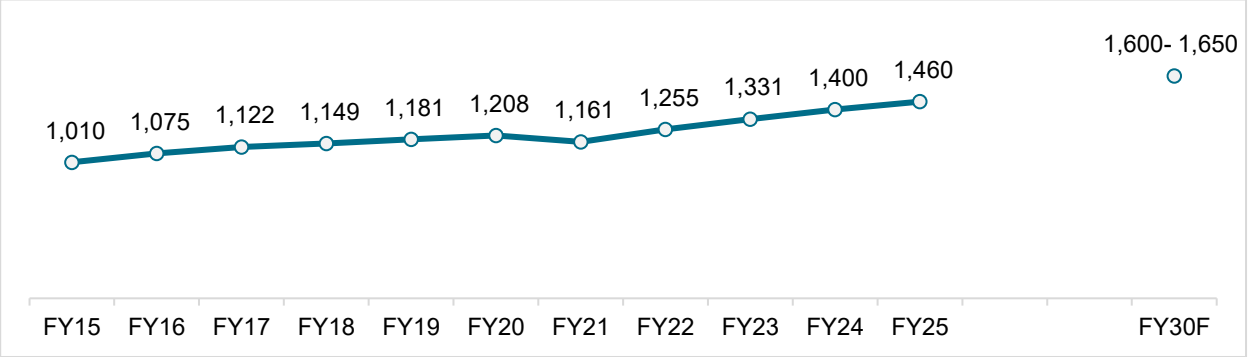


** As per CEA for Fiscal 2025; ** As per CY 2023; rest of the countries data is as of CY2024*
Source: World Bank, IMF, EIA, Crisil Intelligence

Growth outlook - higher consumption, still far below global levels

Crisil Intelligence forecasts India's per-capita electricity consumption to grow at a CAGR of 2–3% annually through Fiscal 2030, supported by improved electricity access, rising incomes, increased adoption of electric vehicles, railway electrification, continued rural electrification, and greater use of consumer durables. Consequently, Crisil Intelligence expects per-capita electricity consumption to reach ~1,600–1,650 kWh by Fiscal 2030.

Figure 4: Per capita electricity consumption (in kWh)



F: Forecast
Source: CEA, Crisil Intelligence

2.2.1 Key demand drivers

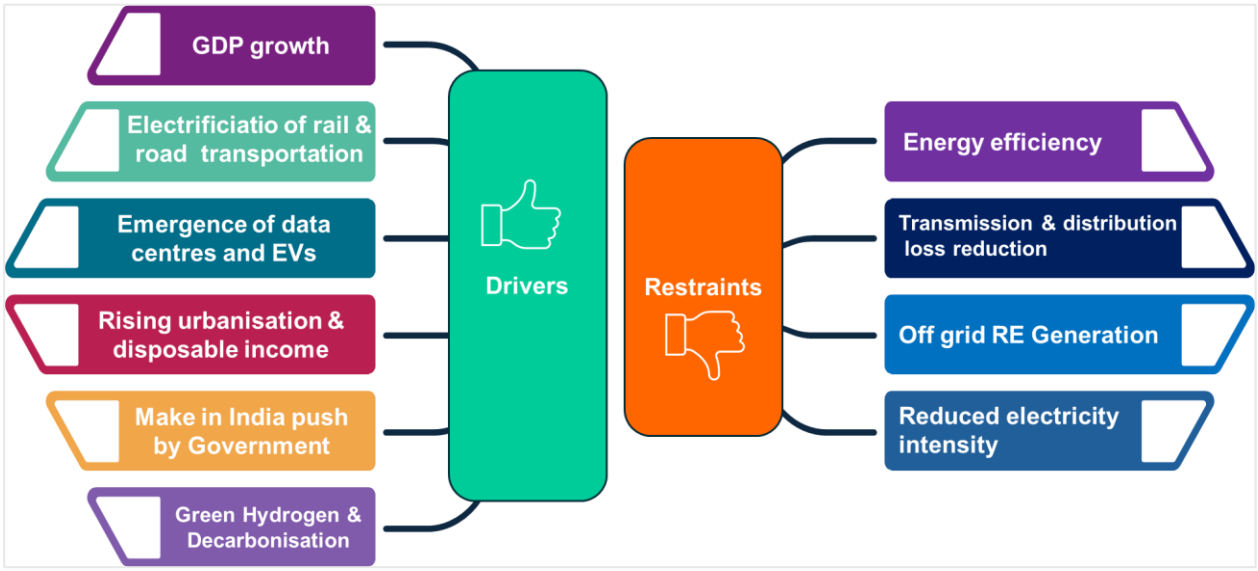
Demand drivers - growth, industrialisation, and electrification deepen electricity intensity

Power demand in India remains closely linked with macroeconomic performance, as higher output, incomes, and urbanisation translate into greater electricity consumption. India has been the fastest-growing major economy, recording average GDP growth of 5.5% and a 5.9% increase in per capita income over the past decade. This macro momentum is expected to keep electricity demand on an upward trajectory.

A set of economy-wide and sector-specific developments further reinforce this trend: the broader investment impulse and reforms (including the *Aatmanirbhar Bharat* relief package), public capex through the National Infrastructure Pipeline (NIP), logistics improvements from dedicated freight corridors, expansion of the services industry, rapid urbanisation, and stronger rural demand supported by farm income improvements and agriculture-related reforms.

Policy initiatives have complemented these fundamentals by expanding access and enabling industrial growth. Schemes such as 24x7 Power for all and *SAUBHAGYA* have supported universal household electrification, while enabling infrastructure initiatives such as the Green Energy Corridor and the Green City scheme support higher integration of renewable power and cleaner urban growth. In parallel, manufacturing-focused measures including the PLI scheme and concessional corporate tax rates for Made in India manufacturing (15% for eligible new manufacturing companies) have helped create the conditions for large-scale industrial capacity addition, which is inherently power intensive.

Figure 5: Factors influencing power demand



Source: Crisil Intelligence

Next-wave use cases - transport, digital infrastructure, cooling and new industrial loads

In addition to core economic drivers, incremental demand is expected from targeted electrification programs and emerging end-use segments. Railway electrification is a major lever, with the government targeting 100% electrification by Fiscal 2026. Similarly, over 1,018 km of under-construction metro rail projects are expected to add ~120–125 BU of electricity demand by Fiscal 2030. Increased adoption of electric vehicles will require expanded charging infrastructure, adding ~40–50 BU of demand. Growth in digital infrastructure is another structural driver, with data centres expected to require ~2–3 GW of power by Fiscal 2027. Data centre capacity in the country has increased from about 375 MW in Fiscal 2020 to around Fiscal 1500 MW by 2025. India's power demand profile is increasingly being reshaped by heatwaves and air-conditioning needs, alongside growing load from artificial intelligence, data centres, and the overarching drive for energy

security. Alongside these, electrification of industrial processes and higher demand from key infrastructure and manufacturing sectors are likely to steadily raise the electricity intensity of GDP.

While demand drivers are strong, part of the growth will be moderated by structural improvements and self-supply. Increasing energy efficiency, a reduction in technical losses over time, and rising off-grid renewable generation are expected to offset ~1% of overall electricity demand.

India's power market is set up for sustained growth capacity expansion and grid planning will need to keep pace with rising electrification and new loads, while accounting for efficiency-led moderation and captive renewable penetration.

India's peak demand continues to be pushed higher as the climate warms. In recent peak conditions (~271 GW in May 2026), the system met demand with a supply mix still led by thermal power (62.8%), with solar contributing meaningfully (22%) during peak daylight hours, along with hydro (5.8%) and wind (5%), and smaller shares from other sources signaling growing role of solar when sunlight is available.

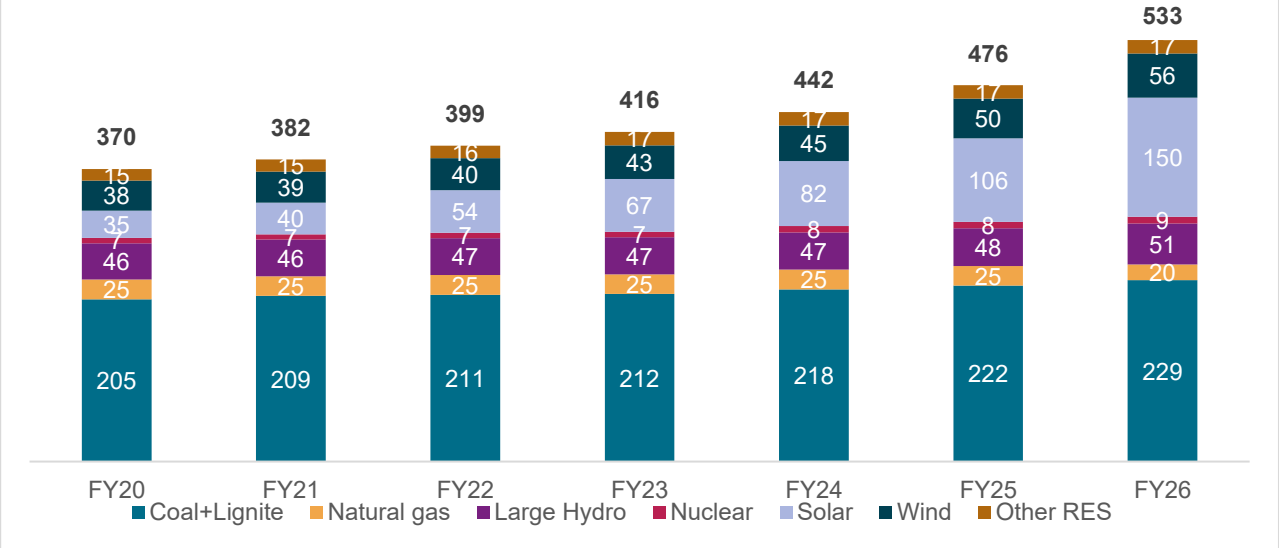
2.3 Power supply in India

2.3.1 Generation capacity additions in India (Fiscal 2020-2026)

Total generation capacity in India - scale-up continues, while the mix steadily transitions

India's power system has continued to expand in line with rising electrification and economic activity. Total installed generation capacity was at ~533 GW in Fiscal 2026, with ~163 GW added during Fiscal 2020 to Fiscal 2026, translating into an overall capacity CAGR of ~6.3% over the period. Even as the system grows, the fuel mix highlights a transition underway rather than complete. Coal and Lignite remain the single largest block of the installed capacity at ~43%, reflecting their ongoing role in meeting baseload demand and supporting grid stability. At the same time, renewable energy (including large hydro) has expanded to ~275 GW as of March 2026, up from ~133 GW as of March 2020, taking renewables to ~52% of total installed capacity. This shift has been led by solar power, with installed solar capacity rising to ~150 GW from ~35 GW over the same period. Remaining 5% is natural gas and nuclear capacity.

Figure 6: Historical Fuel-wise installed capacity (GW)



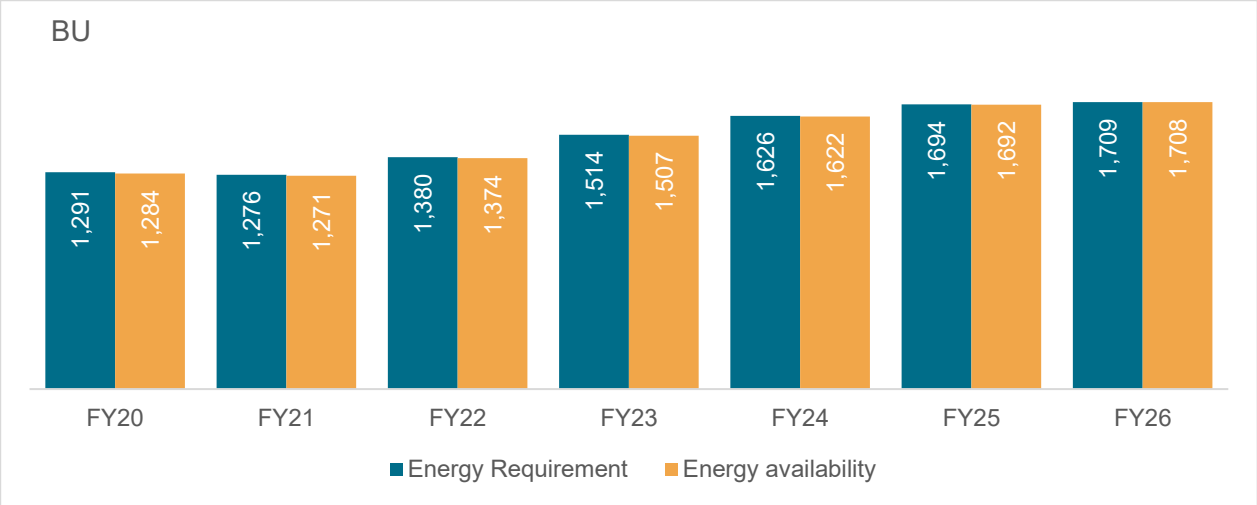
Other Renewable energy sources (RES) include biogas, bagasse, small hydro and waste-to-energy

Source: CEA, Crisil Intelligence

Supply response - availability keeps pace, pulling deficits to near-zero

Electricity availability has broadly matched the rise in requirement, growing at a comparable CAGR of 5.7% between Fiscals 2020 and 2026, supported by strong capacity additions in both generation and transmission. As a result, India's energy deficit narrowed to 0.3% in Fiscal 2024, 0.1% in Fiscal 2025 and further to 0.0% in Fiscal 2026, improving from 0.7% in Fiscal 2020. A key factor behind the rapid reduction in deficit levels has been the strengthening of inter-regional transmission capacity over the past five years. Improved transfer capability reduced supply constraints caused by congestion and limited corridor availability, supporting better balancing of demand and supply across regions.

Figure 7: Aggregate power demand supply

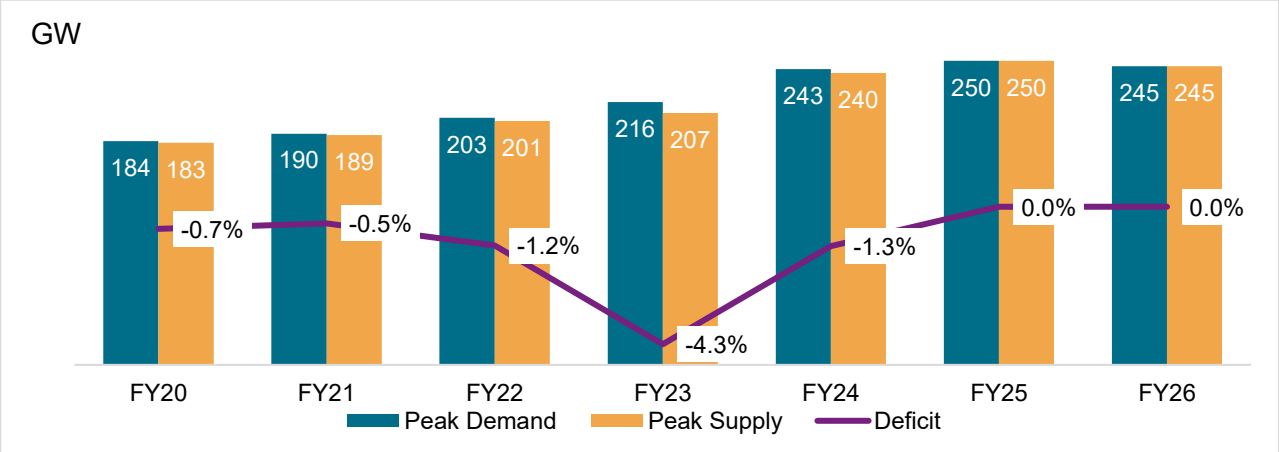


Source: CEA, Crisil Intelligence

Peak demand - the binding constraint is shifting to extremes and weather volatility

India's peak electricity demand rose from 184 GW in Fiscal 2020 to 250 GW in Fiscal 2025, implying an average growth rate of 6.3%. The peak demand touched ~271 GW in May 2026. This consistent rise reflects a combination of economic growth, seasonal variability, and higher daily average temperatures over the past decade. In Fiscal 2026, power demand declined by 2% due to seasonal vagaries despite a 7.7% on year growth in GDP.

Figure 8: Peak power demand and supply



Source: CEA, Crisil Intelligence

While annual energy adequacy has improved significantly, the sector's primary challenge is increasingly shifting toward managing sharp, weather-driven peaks. This evolving constraint underscores the need for timely capacity additions, enhanced grid preparedness, and greater system flexibility to ensure reliable supply during extreme conditions.

2.3.2 Outlook for generation capacity (Fiscal 2027-2031)

A larger system with a greener mix and more flexibility

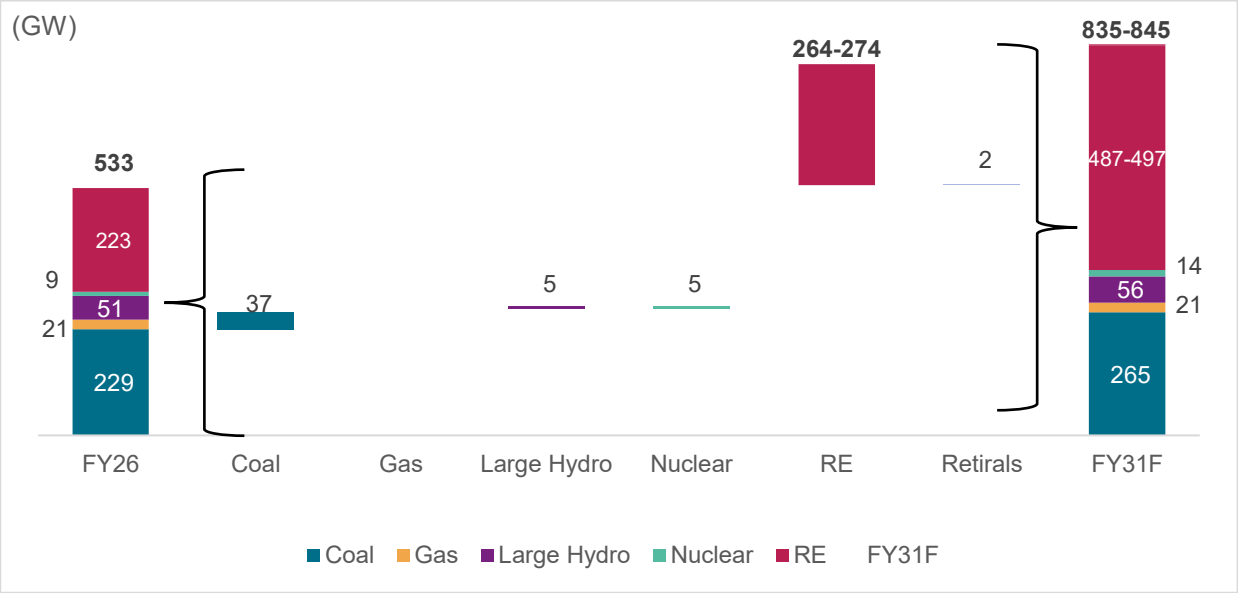
As the system prepares for higher peaks, the need for firm and flexible power capacity additions are expected to broaden beyond renewables alone. Conventional capacity additions are projected at ~35–40 GW during Fiscals 2027–2031. Nuclear additions of ~4–6 GW and hydro additions of ~5–10 GW are also expected during the same period. A defining feature of the next phase of capacity build-out is the acceleration in storage.

Thermal growth will not come at renewables' expense as the economics and capital flows favor RE

By Fiscal 2031, over 80.00% of the new capacity additions will be from RE as RE capacity (excluding large hydro) is expected to add ~264.00-274.00 GW, supported by government initiatives, favourable policies, competitive tariffs, innovative tenders, and enabling infrastructure such as green energy corridors. As a result, total installed capacity is expected to reach ~835.00–845.00 GW by Fiscal 2031, with renewables (excluding large hydro) accounting for over 52.00-57.00% of the mix.

Crisil Intelligence expects that approximately 50.00–55.00 GW of energy storage solutions will be added by Fiscals 2031. These additions are expected to play a critical role in supporting the increasing penetration of renewable energy and mitigating challenges associated with intermittent and variable power generation.

Figure 9: All India installed capacity addition by Fiscal 2031 (in GW)



Source: CEA, Crisil Intelligence

2.3.3 India's NDCs & Net Zero Commitments

Climate commitments are the long-term demand signal for India's RE build-out

India's grid-interactive renewable energy journey accelerated after the Electricity Act, 2003, which requires SERCs to promote renewable generation, enable grid connectivity and sale of renewable electricity, and prescribe minimum renewable purchase requirements. The National Action Plan on Climate Change (NAPCC) launched in June 2008 further institutionalised this direction through eight missions, with the National Solar Mission (NSM) becoming central to India's solar scale-up. NSM was launched in January 2010 with a 20 GW grid-solar target, which was subsequently expanded in June 2015 to 100 GW by December 2022, as part of the broader 175 GW renewable capacity target by December 2022 (100 GW solar, 60 GW wind, 10 GW bio-power, 5 GW small hydro).

At UN Climate Change Conference of the Parties (COP26) and through the Nationally Determined Contribution (NDC) updated in August 2022, India also made verified commitments that extend the RE demand runway: achieving net-zero by 2070, raising non-fossil installed power capacity to 50% by 2030, reducing emissions intensity of GDP by 45% from 2005 levels by 2030, cutting cumulative emissions by 1 billion tonnes during Fiscals 2021–2030, and targeting 500 GW non-fossil capacity by Fiscal 2030.

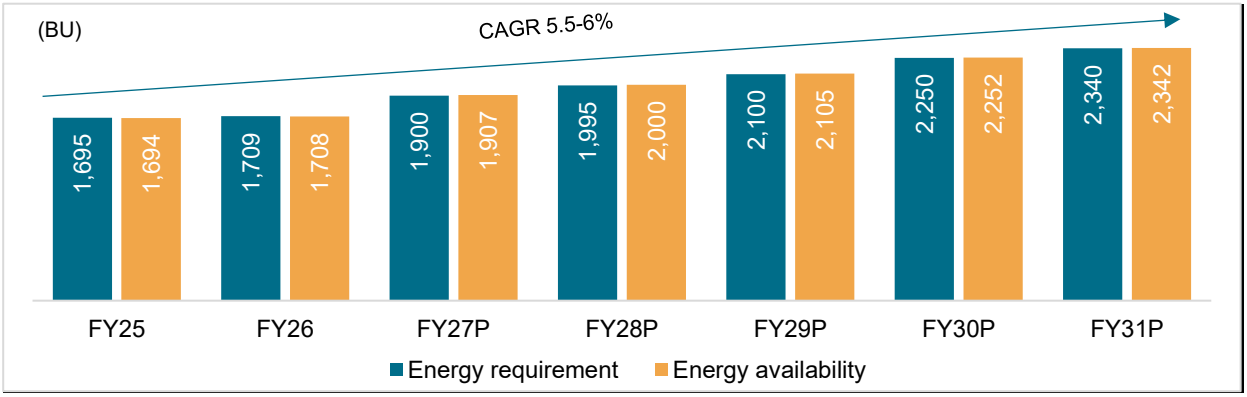
These commitments are expected to structurally accelerate renewable energy deployment as the power sector will play a central role in achieving economy-wide decarbonisation. Meeting the non-fossil capacity targets will require substantial additions in utility-scale solar, wind, hybrid projects (complex hybrid projects combine solar and wind resources to generate electricity) and energy storage systems, along with expansion of transmission infrastructure to integrate variable RE. Battery energy storage system projects (BESS) uses large electrochemical units most commonly lithium-ion systems to store electricity and release it back to the grid when demand peaks or renewable generation drops. The transition is also expected to increase investments in grid modernisation, green energy corridors, round-the-clock (RTC) RE supply solutions and BESS & PSPs, which are critical for maintaining grid stability with higher RE penetration. India's net-zero pathway is expected to drive sustained capacity additions and long-term capital deployment across the RE value chain.

2.4 Outlook for demand supply (Fiscal 2027-2031)

Steady energy growth, faster peak growth

After four years of elevated demand growth (Fiscals 2022 to 2026) at ~5.5%, Crisil Intelligence expects power demand growth to normalise but remain strong, expanding at a CAGR of 5.5–6.0% over the next five years. This outlook is supported by infrastructure-linked capex, resilient economic fundamentals, and a broader power footprint enabled by strengthening transmission and distribution infrastructure. In parallel, ongoing reforms aimed at improving the health of distribution utilities are expected to enhance the quality and reliability of supply further supporting consumption growth. While energy demand is set to rise steadily, system planning is increasingly driven by peak demand which is growing faster and is more sensitive to weather and urbanisation trends.

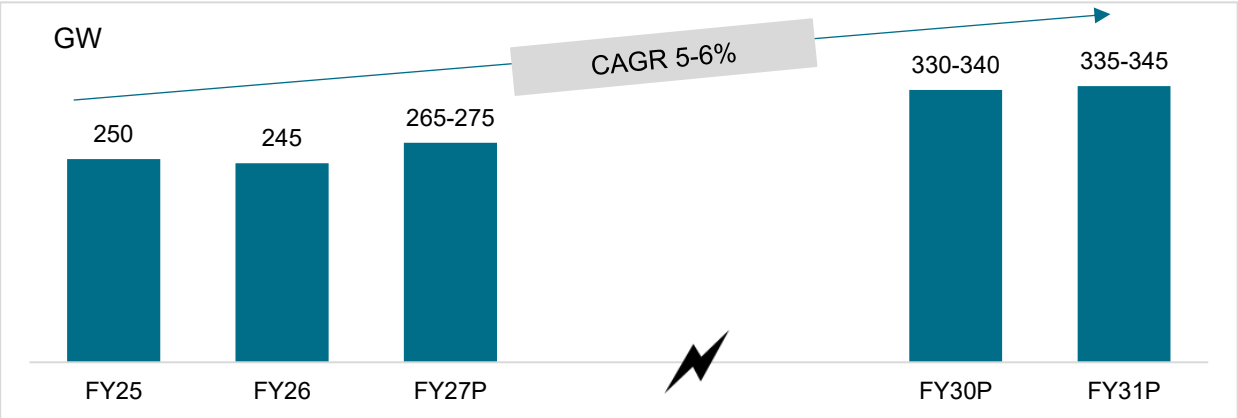
Figure 10: India - Energy demand-supply outlook (Fiscal 2027-2031)



P: Projected, Source: CEA, Crisil Intelligence

Peak demand is expected to grow at an annual average CAGR of ~5-6% between Fiscal 2025 and Fiscal 2031, reaching 335-345 GW by Fiscal 2031. Persistent high temperatures, rising urbanisation, economic growth, and the infrastructure push are expected to keep peak loads elevated. Despite India's significant strides toward becoming a power-surplus nation, peak power deficits cannot be completely ruled out, especially during high-demand summer months or in specific regions.

Figure 11: India - Peak demand to increase to cross 340 GW by Fiscal 2031



P: Projected, Source: CEA, Crisil Intelligence

Meeting higher peaks reliably, especially with a rising share of variable renewables requires not just generation and storage, but also a transmission backbone that can move power across regions and maintain grid stability.

2.5 Investments in power sector (Fiscal 2027-2031)

Generation investments estimated to account for 70-80% of total investments between Fiscals 2027-2031 as India remains committed to COP26 targets

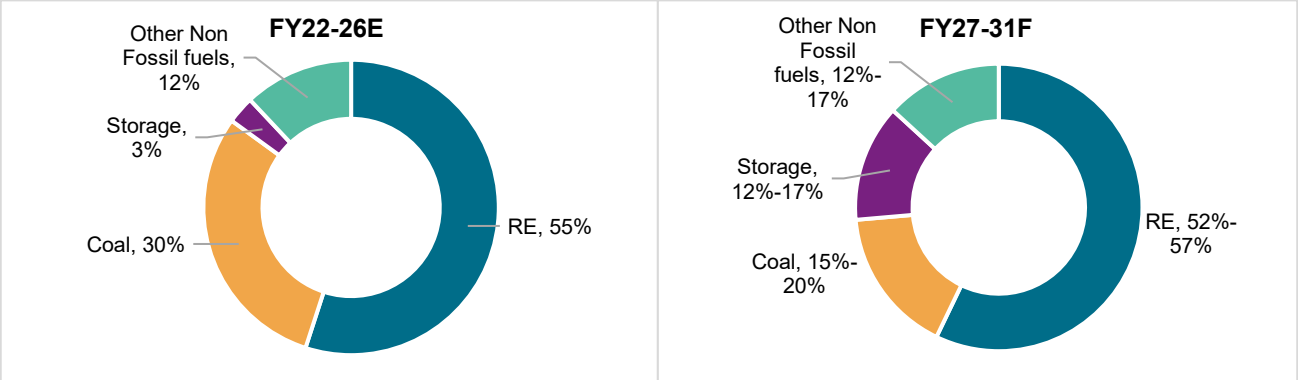
Crisil Intelligence projects investments of INR 37-42 trillion in the power sector between Fiscal 2027-2031. Investments in power generation are expected to increase ~2.5 times from INR 12.0 trillion between Fiscals 2022-2026 to INR 27-32 trillion between Fiscals 2027-2031. Investments in renewable energy (excluding hydro, pumped storage, and BESS) generation capacity is expected to account for 54% of

these investments over the same period as India seeks to achieve its 500 GW of non-fossil energy capacity announced in COP26.

Transmission investments are expected to increase to INR 4–5 trillion during Fiscal 2027–2031 from ~INR 2.6 trillion during Fiscal 2022–2026, led by upcoming ISTS and intra-state (InSTS) projects. These investments are intended to strengthen transfer capability, reduce congestion, and support the scale-up of new capacity additions.

Crisil Intelligence expects INR 4–5 trillion of investments in the distribution segment during Fiscal 2027–2031, driven by network upgradation and smart meter roll-out. The primary objectives are loss reduction, improved billing, and collection efficiency, and improved reliability strengthening DISCOM finances and supporting sustainable sector growth.

Figure 12: Investments in generation Fiscal 2022-2031



E: Estimated; F: Forecast, Source: CEA, Crisil Intelligence

Key Takeaways

- **Demand outlook remains structurally strong:** Electricity demand is expected to sustain healthy growth, supported by India's economic expansion, rising urbanisation, and deeper electrification across end-use sectors.
- **Industry-led load growth is the next major driver:** Manufacturing scale-up alongside emerging loads such as data centres, metro rail, and EV charging is strengthening the structural case for incremental electricity demand and higher peak requirements.
- **Capacity build-out will remain renewable-led, with flexibility scaling up:** Renewables are expected to anchor incremental capacity additions and increase their share in the generation mix, while storage and other flexible resources grow in importance to manage variability and peak demand.
- **Policy direction supports a more diversified and resilient supply mix:** Strengthening support for renewables, hydro, storage, and nuclear is expanding the range of supply options, improving system resilience, and enhancing long-term energy security.

3 Overview of renewable energy sector

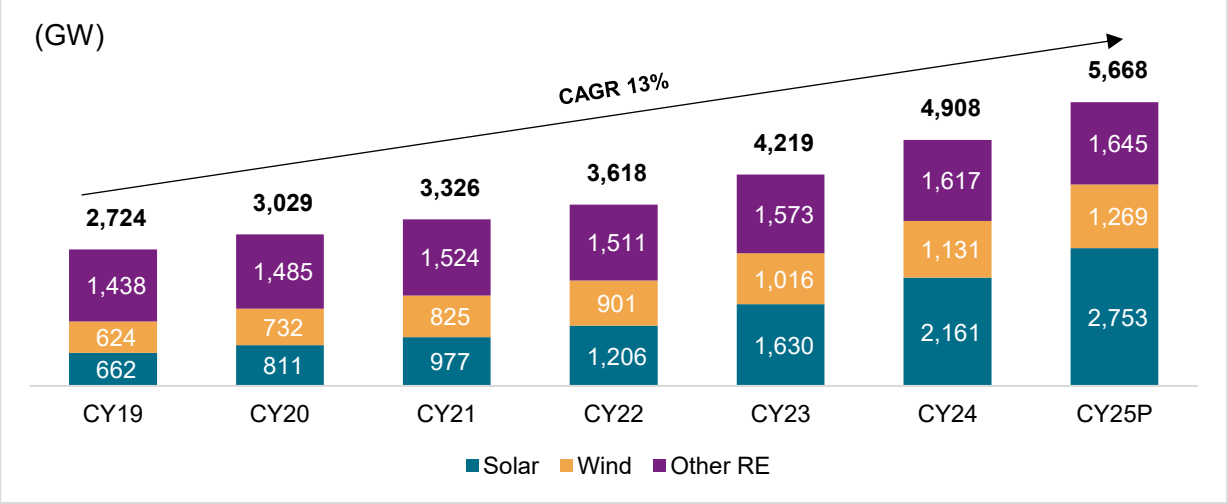
3.1 Global RE capacity additions

3.1.1 Overview and outlook

Installed base - renewables are now a multi-terawatt system, dominated by solar and wind

As per International Energy Agency (IEA), global installed RE capacity was 4,908 GW in 2024. Global installed RE capacity is estimated to reach to 5,668 GW in 2025 from 2,724 GW in 2019, clocking a CAGR of 13.0%. Solar is expected to account for ~49% and wind for ~22% of the total RE capacity installed globally in 2025. Solar power alone is estimated to be over three-fourths of RE additions, with a record 592 GW added during the year, while 138 GW of wind energy expected to be added in 2025. Robust growth has been led by fall in costs, favourable government policies and strong thrust on avoiding carbon emissions.

Figure 13: Source-wise installed RE capacity globally



Notes: Others include hydro power, bio energy and geothermal energy

Solar includes solar photovoltaic (PV)- Distributed, Utility, and concentrated solar. Wind includes offshore and onshore

Source: IEA, Crisil Intelligence

RE installed capacity- major country trends

Global renewable energy capacity additions have been dominated by China, the United States, and India, reflecting robust growth momentum among these top-performing nations. China leads by a wide margin, expanding its installed base at a CAGR of ~20% from 810 GW in 2019 to 2,008 GW in 2024, with projections reaching 2,427 GW in 2025. The US follows with steady growth, rising at a CAGR of 10.4% from 298 GW to 489 GW over the same period, while India has accelerated its capacity and is growing at a CAGR of 11.6% from 133 GW to 258 GW in 2025. Other major countries such as Germany, Brazil, and Japan also show consistent increases, but the scale and pace of additions in China, the US, and India underscore their pivotal role in driving the global renewable energy transition. This trend highlights a highly concentrated expansion, with these leaders setting a benchmark for growth and investment in the sector.

Table 4: RE Installed capacity of major countries (GW)

Country	CY19	CY20	CY21	CY22	CY23	CY24	CY25P
China	810	950	1,097	1,253	1,588	2,008	2,427
USA	298	334	371	397	436	489	544
India*	**133**	**141**	**157**	**173**	**191**	**220**	**258**
Japan	135	147	157	167	177	185	192
Germany	131	138	145	155	174	194	217
Brazil	146	152	162	178	198	220	237
Canada	101	101	104	107	109	111	113
Italy	59	60	61	64	70	77	84
France	56	58	62	67	71	78	86
UK	52	53	55	59	62	65	70

P: Projected;

**Actual data for Fiscal as per CEA;*

Source: IEA, CEA, Crisil Intelligence

China, the USA, and India continue to lead global renewable capacity addition

The global surge in renewable additions led by solar and wind reinforces that clean energy is now a scale game, where speed of execution, depth of supply chains, and policy credibility determine leadership. Against this backdrop, India's third place ranking in annual renewable installations in 2024 (29 GW) signals that it is steadily moving from being a large demand market to becoming a meaningful capacity hub in the global energy transition.

Beyond near-term additions, India's appeal as an investment destination is strengthened by: (i) strong and visible project pipelines, (ii) a large domestic market that supports scale, and (iii) improving ecosystem depth across manufacturing, grid integration, and ancillary services required to sustain high renewable penetration. As global supply chains diversify and capital increasingly targets energy transition themes, India is positioned to attract incremental investments across the value chain from generation assets to enabling infrastructure supporting its emergence as a strategic clean-energy capacity center for both domestic needs and global investors.

Outlook on global RE capacity addition

The global renewable capacity is projected to expand significantly, with an additional ~4,600 GW[1] expected to be added between 2025 and 2030. This growth will be led by China, followed by the USA and India, supported by strong policy frameworks, declining technology costs, and increasing decarbonization commitments.

3.1.2 Overview of installation costs and LCOE

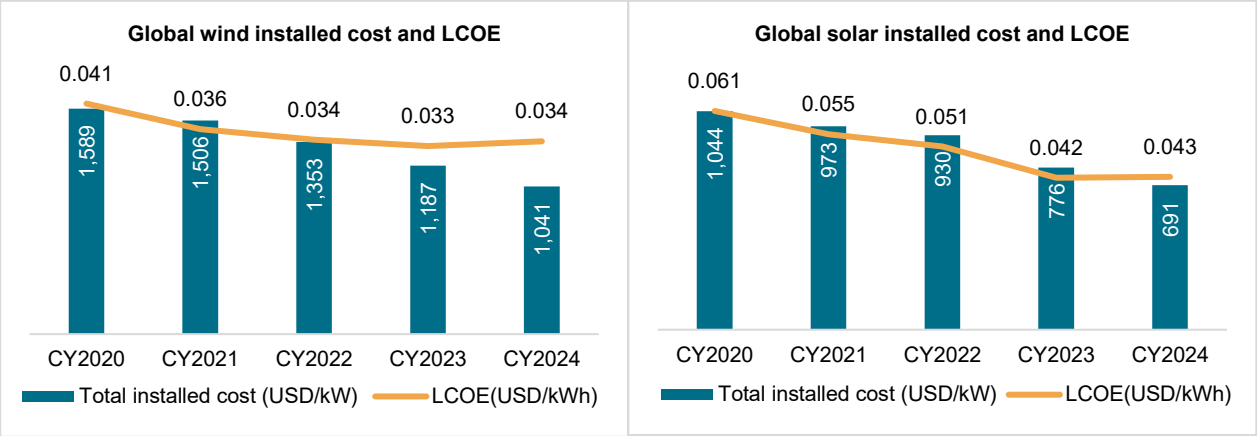
Costs are still falling - keeping wind and solar on a clear affordability trajectory

The recent trends in global wind and solar power costs highlight continued progress in affordability and competitiveness. Installation cost of wind power has undergone cost transformation, with total installed costs steadily declining from about USD 1,588/kW in CY2020 to nearly USD 1,041/kW in CY2024, with the Levelised Cost of Electricity (LCOE) declining from ~ USD 0.041/kWh to ~ USD 0.034/kWh over the same period, reflecting ongoing technology improvements and supply chain efficiencies reinforcing its long-term competitiveness. Meanwhile, solar PV has experienced an even sharper reduction, with installed costs

[1] As per IEA

dropping from USD 1,044/kW in 2020 to USD 691/kW in 2024, and LCOE declining from ~ USD 0.061/kWh to ~ 0.043/kWh, underscoring its status as one of the most cost-competitive sources of new generation capacity majorly due to advances in module efficiency, economies of scale, and expanded manufacturing.

Figure 14: Wind and Solar global installed cost and LCOE



Source: IRENA, Crisil Intelligence

3.2 Overview of Indian RE sector

India's renewable energy (RE) sector has transitioned from policy intent to large-scale deployment, supported by a strengthening policy and regulatory framework that creates demand and reduces counterparty as well as execution risk. India also benefits from abundant solar and wind resource potential, along with improving grid integration pathways, competitive procurement have translated technology and financing trends into bankable tariffs and scalable project pipelines. Cost economics have steadily improved, driven by falling project capex and more efficient O&M including better equipment performance, scale-driven efficiencies, and maturing service ecosystems. This has lowered the lifetime cost of generation and reinforced RE's competitiveness versus conventional power, thereby accelerating adoption and build-out.

3.2.1 Supportive policy and regulatory framework

A sophisticated, multilayered governance architecture underpins India's electricity & renewable energy transition

India's electricity and renewable energy policy framework is multidimensional, multilayered, comprehensive, robust, and institutionally sophisticated, built on clear statutory foundations. At its core, the Electricity Act, 2003 provides the bedrock for the sector by defining the overall market architecture, institutional mandates, and governance principles across the electricity value chain. In parallel, the Energy Conservation Act anchors the enabling ecosystem for efficiency and demand-side governance, complementing supply-side regulation and renewable integration. The Electricity Act, 2003 structures the roles, mutual interplay, and designed independence among Central and State Governments in policy direction and sector oversight. Overall, the framework's strength lies in how it combines policy, regulation, technical institutions, system operations, and market participants into a coherent, checks-and-balances governance model.

Policies and Plans: Setting the Vision and Rules for India's Power Sector

Building on the robust legal foundation of the Electricity Act and Energy Conservation Act, India's electricity sector is further guided by a suite of national policies, plans, and guidelines. These instruments such as the National Electricity Policy, National Tariff Policy, and the National Electricity Plan serve to articulate the broad vision, strategic priorities, and operational ground rules for the sector's development.

The National Electricity Policy outlines the long-term vision for power sector growth, universal access, and integration of renewables, ensuring that all stakeholders work towards common national objectives. The National Tariff Policy provides the framework for fair, transparent, and efficient electricity pricing, balancing consumer interests, financial viability of utilities, and investment incentives. The National Electricity Plan, prepared periodically by the Central Electricity Authority, translates policy vision into actionable generation, transmission, and distribution plans, ensuring reliable and sustainable power supply. Together, these policies and plans guide the actions of central and state agencies, regulators, utilities, and market participants, ensuring that the sector's evolution is aligned with national priorities, technological advancements, and sustainability goals. Following segments highlight the regulatory framework driving the RE sector in India including demand for RE, RE integration, revenue protection and localisation of manufacturing.

A) Pull effects creating demand for renewables

Competitive bidding replaced FiTs and unlocked scale through price discovery

India's utility-scale renewable procurement has largely shifted from regulator-set Feed-in Tariffs (FiTs) to tariff-based competitive bidding (TBCB) to improve transparency, discover prices competitively, and scale volumes via standardized auctions and long-tenor PPAs. This model typically reduces tariff for DISCOMs by using market competition rather than normative calculations, and it has enabled larger project sizes and greater lender comfort because contracting structures are increasingly repeatable. The most visible outcome has been a step-change decline in solar and wind tariffs from early FiT-era levels to auction-discovered prices, alongside a marked increase in average bid capacity per tender as procurement became programmatic.

Standard bidding guidelines reduced contracting variance and improved bankability

The Ministry of Power's standard bidding guidelines were designed to reduce fragmentation across central and state procurers by codifying core tender and contract features with defined timelines, bid security and performance bank guarantees (PBGs), change-in-law principles, payment security expectations, and standardized PPA/PSA structures. When more tenders follow a similar structure, investors can underwrite with fewer unknown unknowns, which typically translates into more predictable cashflows, lower documentation friction, and reduced implementation ambiguity for both lenders and equity. Guidelines are periodically refined to accommodate evolving products such as hybrid and storage-linked tenders, reflecting the shift from energy only procurement toward deliverability and firmness procurement.

RE Implementing Agencies (REIAs)

REIAs function as intermediary aggregators. They tender capacity, sign PPAs with developers, and execute back-to-back PSAs with buying entities.

Rooftop solar is turning households into prosumers - PM Surya Ghar accelerates conversion

India's rooftop solar policy intent is to scale distributed adoption by making households prosumer through capital subsidies and simplified net-metering/connection workflows. PM Surya Ghar: Muft Bijli Yojana is positioned to accelerate residential rooftop uptake by improving affordability and streamlining onboarding

through more standardized consumer-facing processes. The scheme aims to achieve rooftop solar installations in 10 million households in the residential sector by Fiscal 2027 with an outlay of INR 750.21 billion. A total of 9,566.89 MW of rooftop solar capacity has been installed in the country under the scheme in the residential sector as of March 2026.

High rooftop penetration can reduce DISCOM peak procurement pressure, diversify RE growth beyond utility tenders, and create a repeatable, high-volume market for installers and O&M providers. Rooftop scale enables aggregation models, platform-led origination, portfolio O&M, and consumer financing that rely less on single, large utility PPAs.

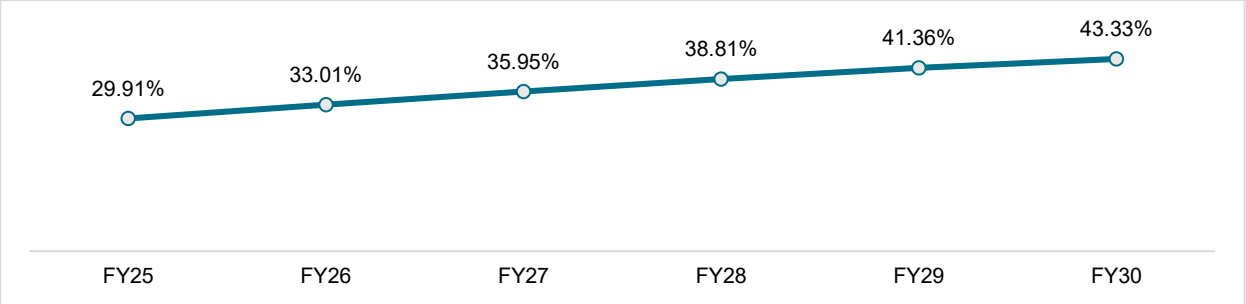
PM-KUSUM is a farm-sector decarbonization lever with quasi-utility offtake characteristics

PM-KUSUM targets the agricultural segment through a three-pronged approach - decentralized solar plants, solar powered pumps, and solarization of feeders, aiming to reduce diesel consumption and ease the Fiscal burden of subsidized agricultural power. The scheme aim to add solar capacity of about 34.8 GW by March 2027 with total Central Financial support of INR 344.22 billion. Capex support and structured procurement frameworks link farmers, DISCOMs, and developers, frequently via feeder-level or localized projects. KUSUM can improve rural supply reliability and create a sizable-distributed pipeline with offtake dynamics that resemble utility procurement (but execution is state-dependent and programmatic). The scale is meaningful, but outcomes vary by state readiness, procurement discipline, and on-ground implementation capacity.

RPO/RCO makes renewable demand statutory and supports both PPAs and REC markets

Renewable Purchase Obligations (RPOs)and increasingly consumption-linked obligation constructs (often referred to as RCO frameworks) create mandatory demand for renewable procurement by DISCOMs and certain open-access consumers. Compliance is typically enforced by regulators and supported through multiple alternatives, including direct procurement of RE and instruments such as Renewable Energy Certificates (RECs). This mechanism provides policy-backed offtake pull even when DISCOM discretionary procurement slows, and it nudges C&I entities toward open-access renewables, deepening corporate PPA demand and green attribute trading. RPO targets have tightened over time and now stands at 43.33% by Fiscal 2030 from 29.91% in Fiscal 2025.

Figure 15: Long Term growth trajectory for RPO up to 2030



Source: MOP, Crisil Intelligence

Green Day-Ahead Market (G-DAM) adds a transparent short-term monetization channel

G-DAM enables exchange-based trading of green electricity with transparent price discovery and standardized contracts cleared through exchange mechanisms, which typically reduce counterparty risk, versus purely bilateral short-term arrangements. For merchant or partially merchant assets, G-DAM

can serve as an alternate revenue route to complement PPAs. For buyers, it offers flexible compliance procurement (e.g., to meet obligations without locking long tenors), improving system-level balancing and market liquidity. The G-DAM on the Indian energy exchanges experienced substantial growth in Fiscal 2025, driven by rising renewable energy adoption. The total G-DAM volume in exchanges reached 8,321 MUs in Fiscal 2025, an increase of 233% over Fiscal 2024. Till February 2026, the G-DAM volume was around 9,485 MUs for Fiscal 2026 compared to 7,744 MUs till February 2025 (an increase of 22%).

Green Energy Open Access (GEOA) is the backbone for scaling corporate renewable platforms

The Green Energy Open Access Rules, 2022 expand C&I access to renewable procurement (increasing the scope of open access from customers with contract demand more than 1MW to more than 100 kW, with no limit for captive consumers). GEOA rules aim to simplify and standardize open access for renewable energy by reducing approval friction and improving predictability through provisions such as a cap on cross-subsidy surcharge escalation, additional surcharge waivers under defined conditions, monthly banking with charges, and deemed approvals if applications are not processed within 15 days. By lowering procedural uncertainty, GEOA strengthens the bankability of third-party and captive C&I structures and supports multi-state corporate renewable platforms – a key growth vector beyond DISCOM tenders. These measures support faster C&I adoption, subject to state-level implementation and discom cooperation.

Green energy open access portal- a major step towards facilitating open access approvals

Green Open Access Registry is a transparent platform through which long term, medium term and short-term open access transactions will be managed and performed to interstate transmission system and intra state transmission system. Green Energy Open Access (GOAR) portal is the single window portal to register and apply for Green Energy Open Access. As on 3rd July 2026, 517 users are registered on GOAR platform. 1,59,222 number of GEOA applications with a cumulative energy quantum of 39,819 MUs were approved through GOAR from since inception till March 2025. The energy quantum approved during the Fiscal 2025 was 6,469.01 MUs.

NOAR digitizes open access by cutting discretion and shortening cycle times

National Open Access Registry (NOAR) has successfully gone live from 1st May 2022. NOAR has been designed as an integrated single window electronic platform accessible to all stakeholders including open access participants, traders, power exchanges, national/regional/state load despatch centres for electronic processing of short-term open access applications thereby automating the administration of the short-term open access in inter-state transmission system. The NOAR centralizes and digitizes open access applications, approvals, and scheduling interfaces across utilities and SLDCs. Digitized workflows reduce process risk through greater transparency, auditability, and shorter turnaround times, which improves day-to-day operability for C&I portfolios and supports structured finance by strengthening compliance traceability.

Green hydrogen policy creates a new 24/7 anchor demand for renewables

India's green hydrogen thrust is designed to catalyze both supply and demand through mission targets, incentives, and offtake enablement across hard-to-abate sectors (e.g., refining, fertilizers, steel, and potentially shipping fuels). This policy increases demand for renewables that are firmed and schedulable, benefiting hybrids and storage because electrolyzers prefer high utilization and stable power input. Green hydrogen introduces long-duration growth optionality for the RE ecosystem, but near-term underwriting depends heavily on execution readiness, offtaker credit quality, evolving standards, and delivered cost

competitiveness. As per government estimates, the National Green Hydrogen Mission aims to build the capacity and ecosystem required to position India as a global leader in clean hydrogen. By 2030, the Mission will be supported by about 125 GW of new RE capacity dedicated to green hydrogen production, along with investments exceeding INR 8 trillion as estimated by Government.

B) Push effects supporting integration of RE into the grid

ISTS connectivity expands the offtake universe beyond state borders

Inter-State Transmission System (ISTS) connectivity allows renewable projects to sell power to demand centers outside the host state. Standardized connectivity and scheduling frameworks reduce evacuation uncertainty and improve market depth by enabling national-scale auctions and a more diversified offtake pool. Developers can reduce state concentration risk and improve offtake optionality by accessing a wider buyer set. As per the National Electricity Plan (NEP) transmission by CEA, India plans to expand its inter-regional power transmission capacity from approximately 120 GW as of December 2025 to 143 GW by Fiscal 2027 and 168 GW by Fiscal 2032 to support rising demand and RE integration.

RE parks and zones de-risk early development through shared infrastructure

India's RE parks/zones model pre-develops key elements such as land aggregation, internal roads, pooling substations, and permitting facilitation so developers face fewer first-mile risks. This structure typically shortens development timelines, reduces delay probability, and lowers capex uncertainty conditions that attract large-scale, low-cost capital and enable large-format projects. As on 31st March 2026, Solar Parks of aggregate capacity of 41,234 MW have been envisaged for development in the country. These parks were proposed to be set up by Fiscal 2026. Of these, the capacity of 21,312 MW has already been commissioned while 7,065 MW capacity is under construction, and 12,857 MW is under award/tendering process.

Green Energy Corridor (GEC) is reducing evacuation bottlenecks in RE-rich states

The Green Energy Corridor program focuses on strengthening intra-state and inter-state networks, new lines, substations, and grid upgrades so the system can absorb variable renewable generation with fewer bottlenecks. By reducing curtailment and improving dispatchability, GEC is a key enabler of scaling wind/solar in resource-heavy regions without overloading local networks. Details of various schemes are summarised in following table.

Scheme	Transmission lines (ckm)	Sub-station Transformation capacity	Expected RE capacity to be integrated (GW)	Status
ISTS GEC project Phase-I	3,200	17,000 MVA	6 GW	Commissioned in March 2020
ISTS GEC project Phase-II	1,268	5,000 MW HVDC terminals	13 GW RE 12 GWh of BESS	By 2030
InSTS GEC-I	9,700	22,600 MVA	24 GW	Under implementation
InSTS GEC-II	10,750	27,500 MVA	20 GW	Under implementation

National Electricity Plan (NEP) transmission build-out is meant to keep evacuation ahead of additions

CEA with the aim of transmitting 500 GW of Renewable Energy installed capacity by the year 2030 and over 600 GW of Renewable Energy installed capacity by the year 2032, prepared the detailed NEP-Transmission. As per the plan, over 1,91,000 ckm of transmission lines and 1,270 GVA of transformation

capacity is planned to be added during the ten-year period from Fiscal 2023 to Fiscal 2032 (at 220 kV and above voltage level). In addition, 33 GW of HVDC bi-pole links are also planned. With several transmission schemes under various stages of construction, bidding and in pipeline, the transmission Plan provides visibility to the investors of the massive investment opportunity of over INR 9.15 trillion in Transmission Sector till the year 2032. The NEP's transmission planning approach is intended to align corridor expansion, substations, and system strengthening with 2030-era non-fossil ambitions and new load growth. Strong forward planning reduces the risk of stranded generation assets caused by evacuation constraints and supports confidence that auction pipelines can translate into commissioned capacity.

C) Cashflow protection + grid operability measures are reducing systemic risk

Must-run status protects dispatch priority, supporting revenue stability

The Electricity (Promotion of Generation of Electricity from Must-Run Power Plant) Rules, 2021, confers must-run status to a wind, solar, wind-solar hybrid, or hydro power plant (in case of excess water leading to spillage). Treating these renewables as must-run means that they should not be backed down except for grid security reasons. This provides a policy basis to prioritize renewable scheduling and reduce curtailment-driven revenue volatility, which strengthens debt service resilience. Curtailment can still occur in practice; the value is that must-run strengthens the discipline and remedy framework around avoidable backing down.

ISTS charge waivers lowered delivered cost and accelerated interstate renewable sales

The ISTS waiver has been an important delivery-cost enabler for inter-state renewable supply. The benefit, which was initially available to the extent of 100% waiver, will be gradually reduced in a time-bound fashion. In August 2020, the Ministry of Power waived ISTS charges and losses for all solar and wind projects commissioned before June 30, 2023. This waiver was extended in June 2021 until June 30, 2025; however, only ISTS charges were waived, while losses remained applicable. Projects commissioned by June 30, 2025, will continue to benefit from this waiver. Post-June 2025, ISTS charges will increase by 25% annually for solar, wind, hydro PSP, and BESS projects, reaching 100% applicability by July 2028. PSP and BESS projects have waiver eligibility up to 30th June 2028 subject to specified conditions. As waivers phase out, ISTS-linked tariffs may trend upward, and commissioning timelines become more critical for project viability.

Late Payment Surcharge (LPS) rules are improving DISCOM payment discipline

LPS rules were designed to deter delays in payments through surcharges and have resulted in a more structured dues-clearing mechanisms, often linking continued access/scheduling to payment behavior. Better payment discipline reduces receivable build-up, improves cash conversion cycles, lowers working-capital stress, and increases lender confidence which is important for low-tariff renewable PPAs with tight margins. The Late Payment Surcharge Rules, 2022 link delayed payments to structured liquidation mechanisms (EMIs) and progressive enforcement actions strengthened cash-flow certainty for generators and transmission utilities. These rules offer a structured mechanism to recover overdue receivables from DISCOMs by converting outstanding amounts into instalments, improving security for receivables and reducing payment delays. As of March 2026, LPS rules have significantly improved the financial discipline of DISCOMs, reducing legacy dues from INR 1.39 trillion in June 2022 to roughly INR 33.30 billion.

Grid access is shifting from LTA to GNA, simplifying rights and improving flexibility

The move from corridor-specific Long-Term Access (LTA) toward General Network Access (GNA) aims to simplify transmission access by replacing path-dependent allocations with a more flexible network access paradigm. GNA supports evolving market structures (exchanges, hybrids, multi-buyer contracting) and signals a maturing access regime with potentially fewer procedural bottlenecks over time. While the GNA regime streamlines inter-state connectivity and access, the transmission charge-sharing regulations clarify allocation of inter-state charges and losses, and the Deviation Settlement Mechanism (DSM) strengthens scheduling discipline. All put together, these have helped to create a robust regulatory framework, supporting access processes, cost allocation transparency, and improved reliability for large-scale procurement.

Electricity rule rationalization is aligning regulation with new market designs

Captive procurement remains a key route for corporate renewable adoption, with benefits (including exemption from cross-subsidy surcharge) available upon fulfilling the twin conditions of 26% equity ownership and 51% consumption conditions, have been reformed to allow greater flexibility for genuine renewable-heavy captive models. The MOP notified the Electricity (Amendment) Rules, 2026, on March 13, 2026, to streamline captive power generation. Key changes effective April 1, 2026, include clearer definitions for captive user (widening it to group level) and enhanced proportional consumption tracking. The rules aim to ease green power procurement, reduce legal disputes, and clarify rules for special purpose vehicles (SPVs). With clarity on eligibility and proportionality, group captive is the preferred route due to minimal investment and exemption from cross subsidy surcharge and additional surcharges.

D) Industrial policy is de-risking supply chains through domestic manufacturing depth

ALMM is steering demand toward qualified modules raising traceability and domestic capacity

The Approved List of Models & Manufacturers (ALMM) is used to channel demand toward approved/qualified module suppliers based on compliance and traceability requirements. ALMM consists of List-I, specifying models and manufacturers of solar PV modules and List-II, specifying models and manufacturers of solar PV cells and List-III includes ingots and wafers. List-II for Solar PV Cells has been effective from July 1, 2026. ALMM List-III for ingots and wafers, which will come into effect from the 1st of June 2028. Enlisted solar PV module capacity under ALMM List-I stood at ~193 GW and solar PV cell capacity under ALMM List-II stood at ~31 GW as of June 2026. It supports domestic manufacturing scale-up and quality assurance but can tighten supply or influence pricing so contracts must actively manage delivery schedules and compliance risk. The MNRE requires projects, including government-backed schemes, net-metering projects, and open access, to source their solar cells from the ALMM List-II for module manufacturing. This applies to all projects under the ALMM framework, ensuring solar modules listed in ALMM List-I are manufactured using domestically produced solar cells from List-II, except for specific exemptions which include projects with bid submission deadlines on or before December 9, 2024, which are exempt from the requirement to use ALMM List-II solar cells, regardless of their commissioning date. This means these projects can use imported solar cells even if commissioned after June 1, 2026, provided they use modules from ALMM List-I. Subsequently, in May 2026, MNRE clarified that no blanket extension of the ALMM deadline, i.e., 1st June 2026, will be given. MNRE further clarified that Net-Metering/Open Access, RE power projects, where (a) installation of solar modules is completed but not commissioned or (b) Effective steps have been undertaken by the RE power developers towards grounding the projects, such cases would be considered for appropriate time-extension on case-to case basis in respect of applicability of ALMM List-II (for solar PV cells), after objective assessment of the supporting information/ documentary proofs provided by such developers. Further, in June 2026, MNER clarified that Utility and C&I projects may apply through the portal as provided by MNRE and only in the interim period, provisional commissioning of such projects may be allowed, subject to the final outcome. Furthermore,

MNRE in July 2026 clarified that there would be no blanket extension in applicability of ALMM List-II for solar power projects and a limited window is provided for Net-metering projects and Open Access RE power projects, whereby such projects can now commission with exemption of ALMM List-II (for solar PV cells), till 31st December 2026.

Solar modules that use domestic cells are expected to be even more expensive, with prices at least 50% higher than those using imported cells. Crisil Intelligence estimates prices for imported cell-based modules to be in the range of $0.14-0.16/wp and for domestic cell-based modules in the range of $0.24-0.26/wp in Fiscal 2027. The capex for solar plant using domestic cell-based module is higher by Rs. 5-10 million per MW. As a result, the tariffs for the solar plants using domestic cell-based modules may see an upward trend.

Wind approved/qualified model approaches reduce technology and O&M continuity risk

In November 2018, MNRE had issued 'Procedure to apply for inclusion of a Wind Turbine Model in the Revised List of Models and Manufacturers of Wind Turbines (RLMM). The RLMM was a mechanism to ensure quality and reliability of wind turbines installed in the country, for protecting the consumer interests, while ensuring larger energy security of the country. The mechanism was one of the enablers towards promoting domestic wind turbine manufacturing industry in the country, which currently crossed the 20 GW annual manufacturing capacity.

Through an amendment on July 31, 2025, the RLMM has been renamed as ALMM (Wind). Further, it is now mandatory for use of major wind turbine components such as blade, tower, gearbox, generator, and special bearings (main, pitch and Yaw bearing) from the ALMM (Wind Turbine Components) in the manufacturing of listed wind turbines. The ALMM (Wind Turbine Components) list will be issued by the Ministry separately. The amendment also includes mandatorily locating Wind Turbine R&D Centre, Data Centre and/or Servers within India to strengthen the cybersecurity ecosystem.

This amendment will not be applicable on the already bided wind projects and captive/open access/C&I/third-party sale projects to be commissioned within 18 months from date of issuance of the amendment. In addition, new wind turbine manufacturers and / or new wind turbine models will be exempted from mandatory use of components listed in ALMM (Wind Turbine Components) for a total capacity of 800 MW for a period of two years to promote the new technologies having new innovation & performance efficiency not available indigenously. This step is expected to boost the existing quality control mechanism including the cyber security aspects along with boosting domestic manufacturing in wind sector.

Newer wind turbines are being launched that have higher rated capacity up to 5,200 kW and higher hub height (upto 160 m with rotor diameter of more than 160 m), which can be set up at low-quality wind sites, otherwise considered economically unattractive. Generally, larger WTGs can provide operational and financial benefits such as improved plant load factors, energy production and cost savings

3.2.2 Untapped potential for solar and wind energy in India

India benefits from strong solar irradiation and favourable wind regimes, translating into large technical potential of 748.99 GW for solar (NISE) and 695.5 GW for wind at 120-meter hub height (NIWE). States like Rajasthan, Gujarat, Maharashtra, Karnataka, and Tamil Nadu have high irradiance as well as wind potential. Accordingly, deployment is concentrated in a few states with strong infrastructure and execution momentum. Rajasthan, Gujarat, Maharashtra, Karnataka, Andhra Pradesh, and Tamil Nadu account for ~81% of installed solar capacity, while Tamil Nadu, Gujarat, Karnataka, Maharashtra, and Andhra Pradesh

contribute ~84% of installed wind capacity. The next phase of growth will increasingly depend on timely transmission build-out, smoother grid integration, and scaling of hybrid and storage-linked models that better match generation with demand.

Table 5: Potential of solar and wind in India (as of May 2026)

State	Solar				Wind		
	Solar GHI Range (kWh/m²/day)	Potential (GW)	Installed capacity (GW)	% Potential exploited	Potential (in GW) at 120 m above ground level	Installed capacity (GW)	% Potential exploited
Rajasthan	4.19-5.67	142.31	42.2	29.7%	127.75	5.4	4.2%
Jammu & Kashmir*	1.18-5.87	111.05	0.1	0.1%	-	-	-
Maharashtra	3.05-5.48	64.32	20.3	31.6%	98.21	6.2	6.3%
Madhya Pradesh	3.79-5.53	61.66	6.2	10.1%	15.4	3.7	24.0%
Andhra Pradesh	4.22-5.56	38.44	7.8	20.3%	74.9	4.4	5.9%
Gujarat	4.53-5.72	35.77	32.3	90.3%	142.56	15.8	11.1%
Himachal Pradesh	1.14-5.80	33.84	0.4	1.2%	-	-	-
Odisha	3.76-5.24	25.78	0.9	3.5%	-	-	-
Karnataka	3.87-5.63	24.7	11.3	45.7%	124.15	8.8	7.1%
Uttar Pradesh	4.51-5.26	22.83	4.2	18.4%	-	-	-
Telangana	4.59-5.50	20.41	5.2	25.5%	24.83	0.1	0.5%
Chhattisgarh	4.18-5.28	18.27	1.9	10.4%	-	-	-
Jharkhand	3.70-5.21	18.18	0.3	1.7%	-	-	-
Tamil Nadu	3.11-5.80	17.67	13.9	78.7%	68.75	12.1	17.6%
Others	1.35-5.91	113.76	10.0	8.8%	18.95	0.1	0.5%
Total		**748.99**	**157.0**	**21.0%**	**695.5**	**56.8**	**8.2%**

**Also includes Ladakh;*

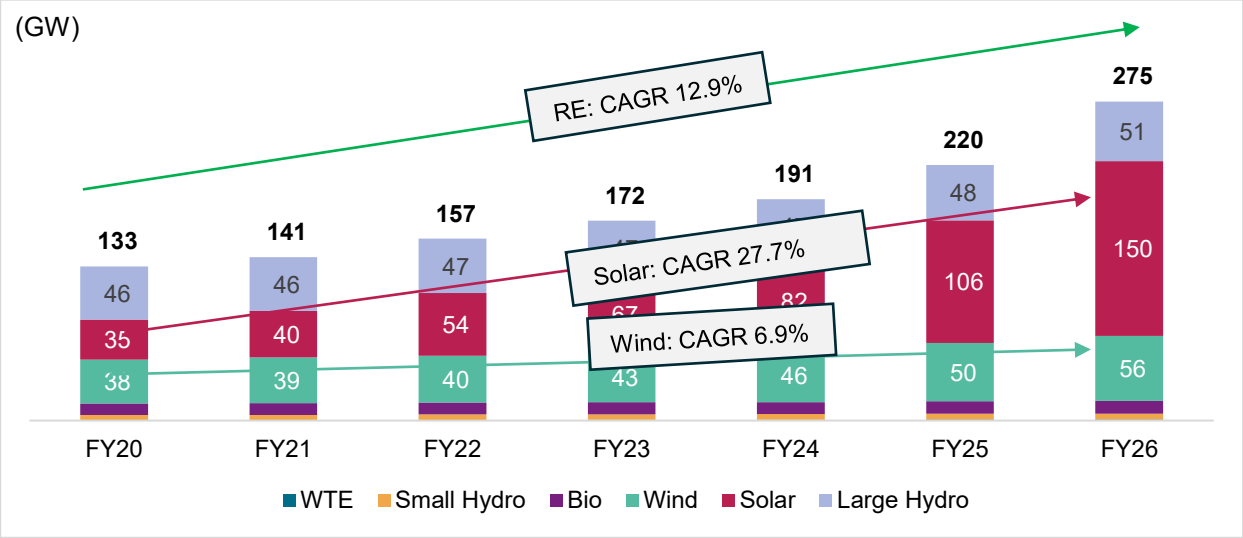
Source: MNRE, CEA, Crisil Intelligence

3.2.3 Overview and outlook for solar and wind capacity additions (Fiscal 2027-2031)

Overview - India's RE story has shifted from policy intent to measurable scale-up

With improved project economics and continued policy support, India's RE sector has also become increasingly attractive for investors. Since Fiscal 2020, India added about 142 GW of RE capacity (including large hydro). As of Fiscal 2026, installed RE capacity (including large hydro) increased from ~133 GW in Fiscal 2020 to ~275 GW, implying a CAGR of about 12.9%. This expansion has been led primarily by solar, with cumulative additions of about 116 GW, followed by wind at about 18 GW, while other RE sources added around 8 GW.

Figure 16: Historical annual RE Capacity additions in India



Source: CEA, MNRE, Crisil Intelligence

Outlook – scale continues, but the mix broadens, and integration becomes central

The next build-out phase is expected to be defined by high volume additions, but with a sharper emphasis on grid integration and execution throughput (land, evacuation, supply chain and timelines). Policy thrust supported by demand from rising electricity consumption, corporate decarbonisation procurement, and central/state tender pipelines keep solar and wind at the core of capacity growth. At the same time, India's push for firm and mixed renewable supply models (hybrid/RTC/FDRE) and increasing storage linkage is expected to influence technology choices and bid structures.

A 230–250 GW solar buildout is expected in Fiscal 2027–2031 - led by multiple parallel pipelines

India's solar growth outlook is anchored in a strong demand-pull and a widening set of execution channels. Rising electricity demand, corporate sustainability commitments, and supportive regulation combined with continued cost optimisation and financing availability are expected to keep solar at the centre of India's clean energy buildout. Crisil Intelligence expects 230.00–250.00 GW of solar capacity additions over Fiscal 2027–Fiscal 2031, supported by multiple, parallel pipelines.

The pipeline is now multi-engine- different channels are scaling solar in parallel

Capacity additions are expected to come from five reinforcing pathways, each addressing a different demand segment and risk profile:

- **Central schemes**: SECI has initiated the ISTS scheme, wherein projects are planned for connection with the ISTS grid directly. Under this, SECI has already been tendered and allocated ~38 GW (including hybrid).
- **PM-KUSUM scheme:** It promotes solar power use among farmers, aiming to install solar pumps and grid-connected solar power plants through central subsidies. enables farmers to set up grid-connected solar plants (up to 2 MW) on fallow land and sell power to DISCOMs at regulated tariffs, with implementation led by state agencies.
    - **Component A**: Setting up 10,000 MW of Decentralized Ground/Stilt Mounted Solar Power Plants

Benefit available: Procurement Based Incentive (PBI) to the Discoms @ 40 paise/kWh or INR 0.66 Mn/MW/year, whichever is lower, for buying solar power under this scheme. The PBI is given to Discoms for a period of five years from the Commercial Operation Date of the plant. Therefore, the total PBI payable to Discoms is up to INR 3.3 million per MW

- **Component B**: Installation of 2 million Stand-alone Solar Pumps

  Benefit available: Central Finance Assistance (CFA) of 30% of the benchmark cost or the tender cost, whichever is lower, of the stand-alone solar agriculture pump is provided. However, in Northeastern States, Sikkim, Jammu & Kashmir, Ladakh, Himachal Pradesh and Uttarakhand, Lakshadweep and A&N Islands, CFA of 50% of the benchmark cost or the tender cost, whichever is lower, of the stand-alone solar pump is provided.

- **Component C:** Solarisation of 1.5 million Grid Connected Agriculture Pumps including through feeder level solarisation

  Benefit available:

  - Individual Pump Solarization: CFA of 30% of the benchmark cost or the tender cost, whichever is lower, of the solar PV component will be provided. However, in Northeastern States, Sikkim, Jammu & Kashmir, Ladakh, Himachal Pradesh and Uttarakhand, Lakshadweep and A&N Islands, CFA of 50% of the benchmark cost or the tender cost, whichever is lower, of the solar PV component is provided
  - Feeder Level Solarization: Agriculture feeders can be solarized by the State Government in CAPEX or RESCO mode with CFA of INR 10.5 Mn per MW as provided by MNRE. However, in Northeastern States, Sikkim, Jammu & Kashmir, Ladakh, Himachal Pradesh, Uttarakhand, Lakshadweep and Andaman & Nicobar Island, CFA of INR 17.5 Mn per MW is provided

- **State solar policies**: ~27 GW of projects are under construction and are expected to be commissioned over the Fiscal 2027-2031 based on tendered capacities by states at the end of January 2026.
- **PSUs**: The central public sector undertakings (CPSU) programme under Jawaharlal Nehru national solar mission (JNNSM) has been extended to 12 GW in February 2019. The government is also encouraging cash-rich PSUs to set up renewable energy projects. NTPC has a target of installing ~35 GW of renewable energy capacities by Fiscal 2028. Similarly, NHPC had allocated ~2 GW of projects in 2020, while the Indian Railways has committed to 20 GW of solar power by 2030. Other PSUs such as NLC, defence organizations, and governmental establishments are also expected to contribute to this addition.
- **Rooftop solar projects**: Crisil Intelligence expects 50-60 GW of rooftop solar projects (under the capex and opex mode) to be commissioned by Fiscal 2031, led by PM Surya Ghar Yojana and industrial and commercial consumers under net/gross metering schemes of various states.
- **Open-access solar projects**: Crisil Intelligence expects 35-45 GW of open-access solar projects (under the capex and opex mode) to be commissioned by Fiscal 2031, led by green energy open access rules 2022, sustainability initiatives/RE 100 targets of the corporate consumers, better tariff structures and policies of states such as Uttar Pradesh and Karnataka, which are more long term in nature.

Wind - additions recover, but constraints shift the market toward hybrids/RTC/FDRE

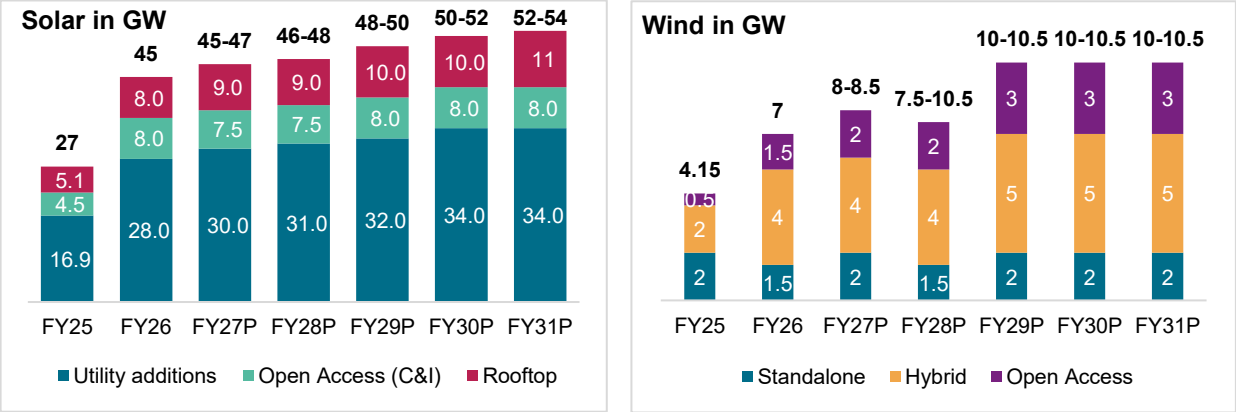
Crisil Intelligence expects capacity additions to grow over the next five years led by pipeline build-up under existing schemes and new tendering schemes, improvement in technology, thrust on green hydrogen, renewable generation obligation and mixed resource models (RTC, hybrid, FDRE etc.). However,

incremental challenges pertaining to wind-site/land availability, grid connectivity, and viability at low tariffs due to elevated capital cost pose challenges for the sector.

Led by India's ambitious clean energy targets declared under NDCs, focus on clean segments such as wind is expected to continue coupled with a healthy pipeline existing in the segment. The government policy to tender 10 GW wind capacity annually till Fiscal 2028 will further boost the capacity additions. Central government allocations under strong off takers such as SECI and PTC, reduce risk and support developer interest. State allocation, on the other hand, has slowed as several states have instead signed power sale agreements (PSAs) with SECI and PTC for procurement of wind power to help fulfil their non-renewable purchase obligation targets.

Crisil Intelligence expects competitively bid capacity additions of 30.00-31.00 GW over Fiscal 2027-2031. In addition to this, open access segment is expected to add additional 14-15 GW by Fiscal 2031, Open access route is expected to be promoted by GEOA rules, 2022, which is expected to drive sustainability business.

Figure 17: Expected annual capacity additions



Source: Crisil Intelligence

India's power procurement landscape is multifaceted, with IPPs having access to various channels to supply electricity. The market can be broadly categorised into two primary segments, providing a range of options for power distribution.

(i) Utility segment: This part of the market involves central government-appointed agencies or state-owned distribution companies (discoms) that buy power directly from producers through a competitive bidding process and, in turn, supply power to a wide range of customers, including businesses, industries, farmers and households.

- **Central government-appointed nodal agencies**: IPPs participate in a bidding process, where they offer their best price for supplying electricity. This bidding is conducted by central government-appointed nodal agencies such as Solar Energy Corporation of India (SECI), NTPC Vidyut Vyapar Nigam Limited (NVVN), NHPC Ltd. and SJVN Ltd. After securing the contract, the IPP signs a PPA with the respective nodal agency, outlining the terms of the deal. The nodal agency, in turn, signs a power sale agreement (PSA) with various discoms, essentially acting as a strong creditworthy intermediary between the IPP and discoms, thereby providing payment security to investors.

***(ii)* C&I segment:** C&I consumers may directly procure electricity from IPPs, outside the regulated utility framework. This is enabled under the Open Access mechanism provided by the Electricity Act, 2003. The IPP and C&I consumer negotiate and sign a bilateral PPA, outlining the terms of electricity supply. The electricity generated by the IPP is transmitted to the consumer through the state's T&D network.

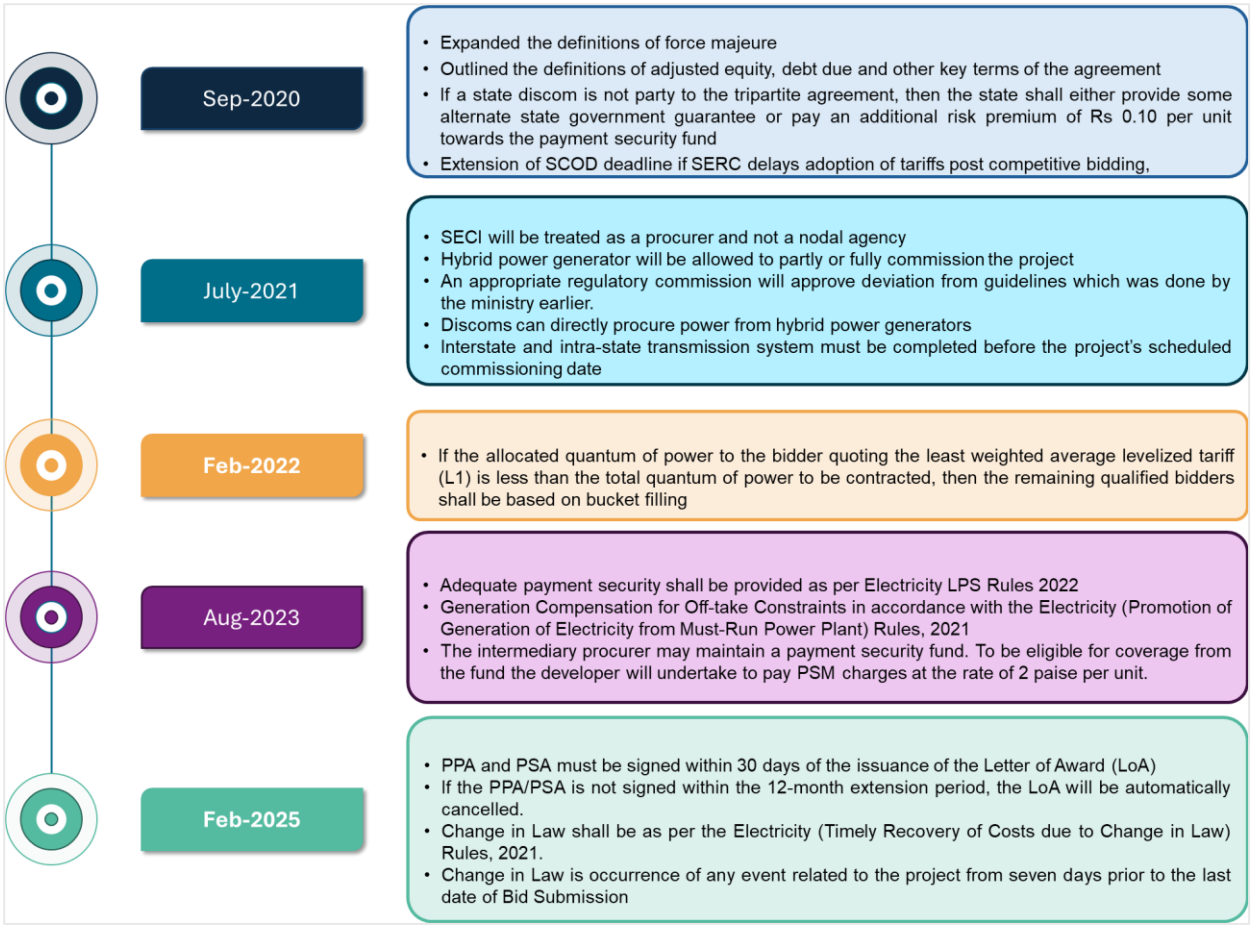
The consumer pays open access charges such as wheeling, transmission and scheduling, as well as applicable losses, to the discom to utilise its network.

3.2.4 Market evolution - competitive bidding, tariffs, and the next build-out phase

The market moved from assured returns to price discovery setting the stage for today's bidding regime

India's renewable procurement has evolved from feed-in tariffs (solar during 2009–2013; wind until 2017) to competitive bidding from Fiscal 2018 onward, with auctions now the primary mechanism for price discovery and risk allocation. Recent guideline refinements including MNRE's February 2025 changes aim to improve bankability through clearer connectivity provisions, stronger performance enforcement, defined change-in-law triggers, and tighter contracting timelines. As storage integration becomes more prominent (including guidance in February 2025 encouraging storage linkage for standalone solar/single technology solar), tariff discovery is moving toward a regime where grid integration and firmness increasingly influence bid outcomes alongside pure capex declines. Single technology projects utilize a single generation or storage technology, including single technology solar projects, single technology wind projects, and single technology BESS projects. Single technology solar projects generate electricity using solar photovoltaic modules only. Single technology wind projects generate electricity using wind turbines only. Single technology BESS projects store electricity in BESS and discharge it as required, without co-located solar or wind generation assets.

Figure 18: Positive changes to bidding guidelines undertaken to support bidder interest



Source: MNRE, Crisil Intelligence

February 2025 MNRE revisions: tighter discipline, clearer contracts

In February 2025, MNRE issued revised guidelines across solar, wind, and hybrid tenders that introduced several structural changes intended to reduce friction while strengthening accountability. First, connectivity clarity was improved by allowing procurers to specify the sub-station for project interconnection, addressing a recurring uncertainty that can affect schedules and costs. Second, performance enforcement was tightened: generators that fail to maintain minimum CUF for two consecutive years become liable to pay damages, raising the cost of underperformance and encouraging more realistic bidding assumptions. Third, MNRE clarified Change in Law triggers by defining eligible events as those occurring from 7 days prior to the last date of bid submission onward, reducing interpretational disputes and lender discomfort.

The revisions also acknowledged execution realities by allowing more time for contracting: PPA and PSA signing can be extended up to 12 months after LoA, easing pressure from procedural delays. At the same time, the framework aimed to speed up regulatory certainty through a requirement that discovered tariffs must be adopted by the appropriate Commission within 30 days. MNRE broadened instruments and tightened oversight through Insurance Surety Bonds, revised Performance Bank Guarantee provisions, and a requirement that procurers seek Commission approval for deviations from the guidelines. Collectively, these measures reflect a market entering a stage where bid competitiveness must be matched with contractual clarity, enforceability, and faster closure.

Storage-linked tenders: redefining the next tariff band

As the auction regime matures, grid integration and firmness are becoming just as central to tariff outcomes as module prices and capex efficiency. This is most visible in the push toward storage-linked procurement. In February 2025, the CEA issued guidance recommending mandatory storage integration with standalone solar/single technology solar requiring an ESS with at least two hours of backup, sized at 10% of the project's solar capacity. Early tenders structured on this requirement (prior to Fiscal 2026) have already discovered tariffs in the INR 3.2–3.6/unit range, and expectations are that this band will remain broadly similar through Fiscal 2026. In effect, tariff discovery is moving into a regime where deliverability and integration, not just generation cost, shape the clearing price.

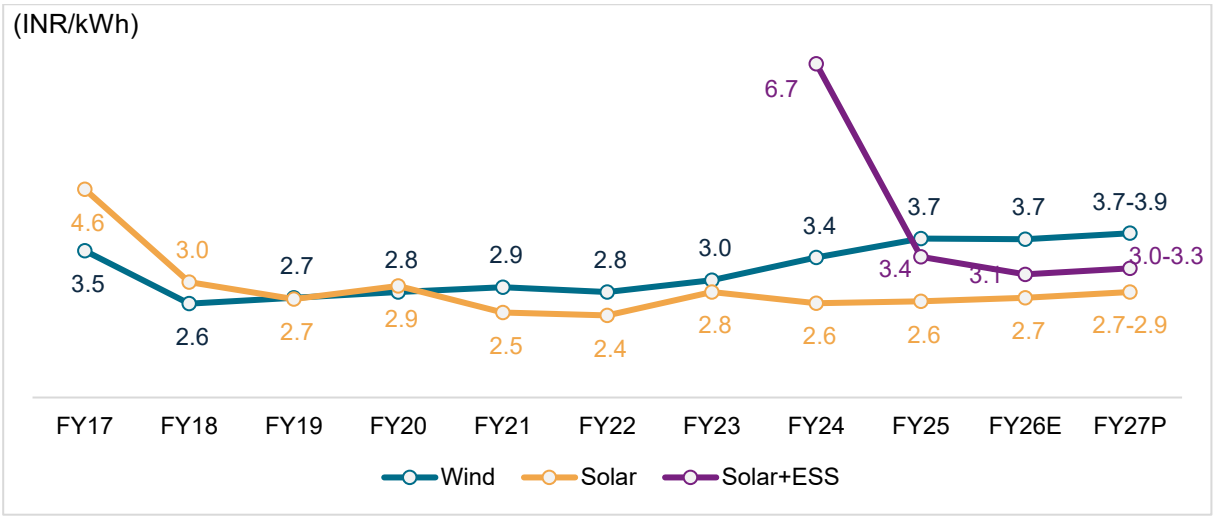
Tariffs tell the story of costs and risk - falling fast, rising briefly, then stabilising

Tariff movements across technologies reflect how competitive auctions transmit both cost trends and evolving risk considerations, while increasingly converging toward sustainable levels. Solar tariffs declined sharply over time, supported by module cost reductions, efficiency improvements, and strong policy momentum. While the trajectory has seen intermittent adjustments, these largely reflect transitional factors rather than structural instability. Following the record low of INR 1.99/kWh (December 2020), tariffs adjusted upward in Fiscal 2021 and Fiscal 2023 due to factors such as basic customs duty (BCD), ALMM implementation, and global supply-side disruptions. However, with supply chains normalising and input costs easing, tariffs moderated to ~INR 2.61/unit in Fiscal 2024 and have since remained broadly stable at ~INR 2.64/unit in Fiscal 2025. This trend indicates that key uncertainties are gradually receding, with tariff discovery increasingly anchored in underlying project economics and improved visibility on costs and regulatory frameworks.

Wind tariffs exhibit a similar evolution, reflecting a transition from aggressive bidding to more calibrated pricing aligned with execution realities. Since 2017, tariffs have progressively adjusted to incorporate considerations such as land availability, grid connectivity, and project execution risks. The weighted average tariff increased from ~INR 3.0/unit in Fiscal 2023 to ~INR 3.71/unit in Fiscal 2025, with Fiscal 2026 estimates indicating stabilisation around INR 3.7–3.8/unit. Further the projections suggest tariffs are likely

to remain within INR 3.7–3.9/unit in Fiscal 2027, pointing to a market that is reaching equilibrium at levels that more accurately reflect lifecycle costs and risk-adjusted returns. Solar plus storage tariffs have shown a moderating trend, declining from ~INR 3.4/unit in Fiscal 2025 to ~INR 3.1/unit in Fiscal 2026, with expectations of INR 3.0–3.3/unit in Fiscal 2027. The tariff trends across technologies suggest that the sector is moving beyond early volatility toward a phase of greater stability, improved risk pricing, and strengthening commercial viability.

Figure 19: Weighted average tariff trends for wind and solar



Note: The above tariffs are for ground-mounted solar only; E: Estimated; P: Projected
Source: Industry, Crisil Intelligence

3.2.5 Favorable cost economics of renewable energy projects

Solar EPC costs have declined significantly, driven by falling module prices

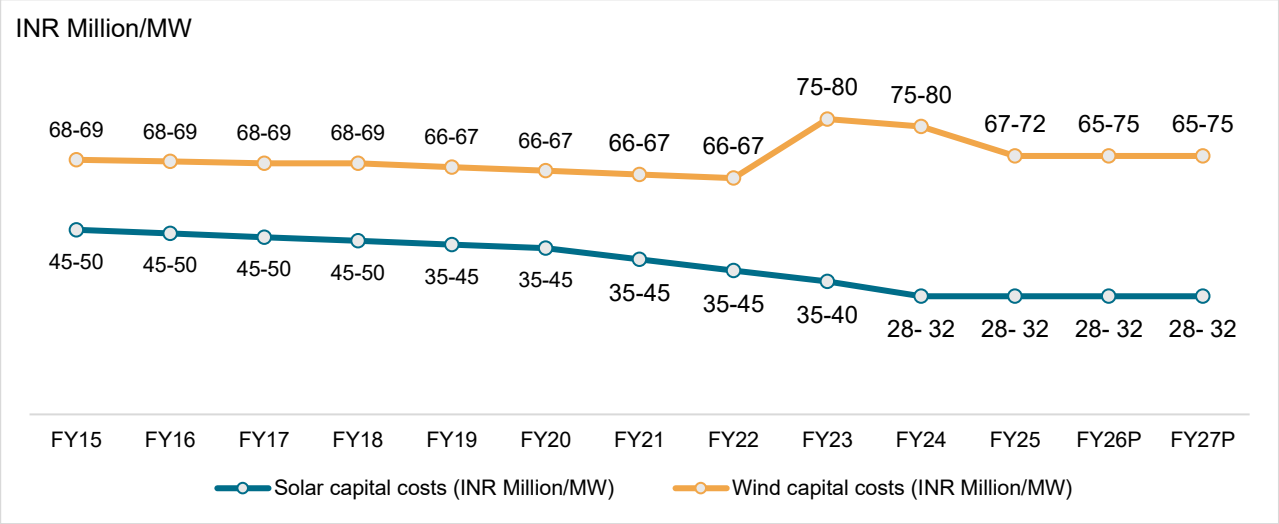
Utility-scale solar EPC costs in India declined by around 65% between Fiscal 2011 and Fiscal 2021, reaching approximately INR 39 million/MWp, primarily due to sustained reductions in module prices. Although landed module costs increased temporarily in the Q2 of Fiscal 2022 following the imposition of Basic Customs Duty (BCD) on Chinese modules, the increase was short-lived. A supply glut in China between the H2 of Fiscal 2022 and Fiscal 2023 led to a sharp decline across the solar value chain, with module prices falling by approximately 57% to around USD 0.12/Wp by December 2023. As a result, utility-scale EPC costs declined further by about 33% to approximately INR 27 Million/MWp by December 2024. Crisil Intelligence expects solar project capex of INR 28-32 Million/MW for Fiscal 2026 and to remain stable through Fiscal 2027, which is not only because of global module prices but also by domestic supply availability and ALMM compliance. Going forward, while Chinese solar module prices are expected to remain soft due to excess manufacturing capacity coupled with subdued international demand (mainly due to US aversion to Chinese imports and high inventory levels in the European Union), domestic prices are expected to hover around USD 0.21-0.23/Wp in Fiscal 2027 due to inadequate, albeit growing, domestic supply and ALMM implementation from April 2024 onwards.

Wind project capital costs have increased due to commodity inflation and turbine scaling

Wind project capital costs have faced upward pressure due to rising commodity prices and supply chain disruptions. Prices of key inputs such as cement and steel increased significantly in Fiscal 2022 and Fiscal 2023, partly due to the Russia–Ukraine conflict, leading to higher project costs and slower commissioning activity from the second half of Fiscal 2022. Additionally, the industry's transition toward larger turbines exceeding 3 MW has improved efficiency but also increased capital costs. While commodity price increase

is expected to moderate, wind project capex is projected to remain rangebound at ~ INR 65–75 million/MW in Fiscal 2026 through Fiscal 2027.

Figure 20: Movement of capital cost for solar and wind (INR Million/MW)



P: Projected; Source: Industry, Crisil Intelligence

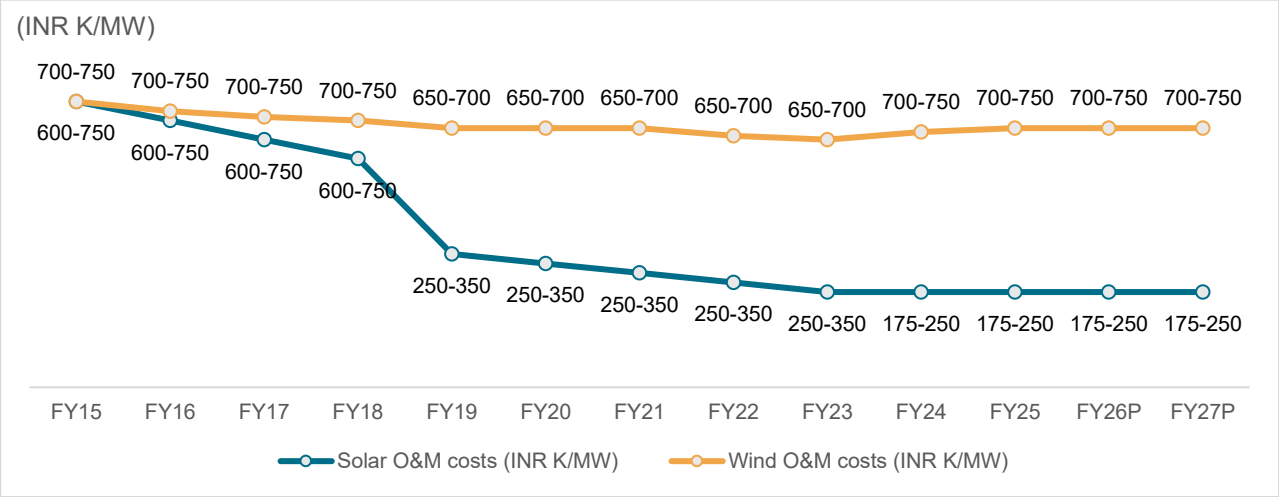
Solar O&M costs are also falling, learning curves and robotic cleaning are making operations cheaper and cleaner

On the operations side, annual operation, and maintenance (O&M) costs have declined by about 30% over the last 3–4 years, reaching roughly INR 0.18–0.25 million/MW/year. This reduction is driven by service-provider experience, maturing maintenance practices, and technology adoption - most notably robotic cleaning, which improves efficiency and reduces environmental impact by using less water and no chemical cleaners.

Wind O&M costs rose with inflation making long-term operating discipline even more critical

Beyond upfront capex, the sector also saw higher EPC and O&M cost pressure due to rising inflation and commodity-linked expenses. As O&M contracts and spares remain exposed to broader price levels and supply availability, elevated inflation conditions have fed into higher operating expenditure, reinforcing the need for tighter lifecycle cost management to protect returns.

Figure 21: Movement of O&M for solar and wind (INR K/MW)



P: Projected; Source: Industry, Crisil Intelligence

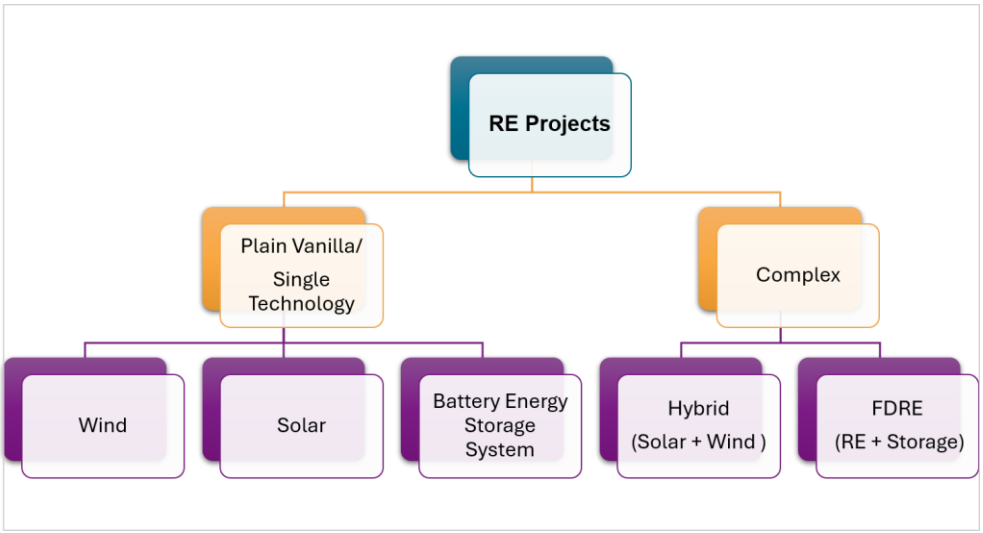
3.3 Procurement routes in the utility segment

3.3.1 Evolution of India's Utility RE Procurement

Under the utility segment, procurement has historically been anchored in central and state-led tendering, where discoms (directly or via central nodal agencies such as SECI/NVVN/NHPC/SJVN) contract long-term power through standardised PPAs designed to scale capacity quickly and discover tariffs competitively.

In the early phase of renewable build-out, this framework largely focused on plain-vanilla (single technology), energy only procurement primarily standalone/single technology solar or wind where the dominant objective was to add megawatts at the lowest possible tariff and rely on must-run treatment for integration.

Figure 22: Broad classification of RE tenders/project configuration in India



Note: FDRE includes RTC projects and assured peak power supply projects also

Source: Crisil Intelligence

As renewable penetration increased, however, offtakers began facing system-level challenges like steeper net-load ramps, higher balancing costs, and curtailment risk making the value of power increasingly dependent on when and how reliably it is delivered, not just on unit price. This has driven a clear evolution in tendering routes: from standalone/single technology RE auctions to wind–solar hybrids, and further into storage-linked and profile-based procurement such as RTC, FDRE and peak power supply, where bids are evaluated on the ability to meet specified delivery schedules and firmness requirements. RTC/FDRE projects integrate solar, wind and/or storage systems to deliver power according to defined load shapes and assured supply windows (FDRE projects) or provide continuous supply of power (RTC projects).

Hybrids solved the first problem of reducing variability by pairing wind and solar on the same grid footprint

Hybrid projects co-optimize wind and solar resources with complementary generation profiles, with solar peaking during the day and wind picking up after sunset. This combination helps reduce sudden drops or spikes in generation, makes better use of the same transmission infrastructure, and lowers variability in plant load factor because the combined output is more consistent throughout the day and across seasons.

FDRE tenders require power supply in alignment with identified Discom's varying demand curve throughout the day. Round-the-clock tenders require round-the-clock green power, with high CUF across all hours. Peak power supply (PPS) tenders require high CUF in identified peak hours, often including both morning & evening peak slots while having relaxed CUF requirement in remaining hours. In effect, the utility procurement model has progressed from buying the lowest-cost renewable energy to procuring grid-aligned renewable capability, with Complex tenders emerging as the mechanism to translate grid needs (firmness, dispatchability, peak support) into bankable contracts and scalable project pipelines.

A national policy push set the foundation for hybrids, and the pipeline is now visible on the ground

A national policy push laid the foundation for hybrids when MNRE introduced the National Hybrid Policy on May 14, 2018, aiming to promote large grid-connected hybrid systems, enable more efficient use of transmission infrastructure and land, reduce variability, and strengthen grid stability. This framework has translated into meaningful execution momentum: as of March 31, 2026, hybrid projects aggregating ~19 GW were under construction across India. With this scale now moving into execution, procurement has begun shifting from simply adding megawatts to improving the quality and usability of renewable power delivered to offtakers.

Complex renewables are redefining what renewable power means in India shifting from energy to capability

Complex renewable projects (Complex) integrate solar, wind and/or storage systems such as BESS, and include complex wind-solar hybrid projects and complex FDRE Projects. Complex FDRE projects combine energy storage systems with solar, wind, or both, to meet specified offtaker requirements and include solar/wind + storage system projects, RTC projects and assured peak power supply projects. Wind and solar resources have complementary generation profiles, with solar peaking during the day and wind usually picking up after sunset, and a combination of the two helps reduce sudden drops or spikes in generation, makes better use of the same transmission infrastructure, and lowers variability in plant load factor because the combined output is more consistent throughout the day and across seasons. Integration of solar and/or wind power generating assets with storage systems such as battery energy storage systems (BESS) enables the delivery of power beyond the typical generation windows, allowing for specified schedules or peak windows based on offtaker requirements. These projects offer commercial advantages,

such as complementary wind-solar profiles, higher capacity utilization factors and profile shaping, which support higher tariffs compared to single technology projects.

Even though MNRE has not announced a specific generation target for this segment, the category is already benefiting from visible institutional support, particularly through SECI and multiple state-level initiatives. In that context, renewable projects can be viewed as evolving across broader categories, with the industry steadily moving toward configurations that provide not just low-cost units, but higher-quality, demand-aligned power.

FDRE guidelines made dispatchability a formal product placing storage at the centre of renewable procurement

As offtakers increasingly demanded firm delivery instead of only improved CUF, policy moved further to formalise dispatchable renewables through storage-backed procurement. In June 2023, the Ministry of Power issued guidelines for procurement of firm and dispatchable power from grid-connected renewable projects with energy storage systems, defining firm and dispatchable power as a configured power profile specified in the RfS and covering assured peak power, RTC renewables, load-following supply, and firm delivery for fixed hours as required by Discoms. The eligible configurations were broadened to include solar, wind, wind–solar hybrids, or any combination supported by an energy storage system, directly addressing the intermittency that limits the grid value of standalone/single technology renewables. In operational terms, developers typically deploy mandatory storage BESS or pumped hydro charged through renewable generation and discharged to match the buying entity's demand profile, converting variable generation into a contracted, profile-compliant supply.

RTC, FDRE and PPS all improve supply quality, but each is designed to solve a different Discom pain point

While these tender formats share the same objective of better supply quality, they differ in operating intent and cost structure because they use wind, solar, and storage in different ways. FDRE is fundamentally load-following, designed to mirror Discom's intraday demand curve through a combination of generation and storage dispatch, with delivered CUF and outcomes tied to compliance requirements. RTC uses complementary renewable supply and storage to fill gaps and provide availability across all hours, often targeting high CUF through continuous balancing. PPS is designed around the economics of scarcity during peak hours, using storage for shorter-duration discharge to deliver reliability during defined peak windows, typically producing high CUF in peak hours and looser obligations off-peak. Peak tenders themselves have been seen in two broad forms: solar plus storage PPS, which limits generation to solar and uses storage to meet peak-hour delivery, and higher-CUF PPS structures that add wind to cover two peak slots such as morning and evening, typically increasing both energy obligations and tariffs.

Discoms are increasingly moving beyond standalone/single technology renewable procurement and showing a clear preference for wind–solar hybrid (WSH) and round-the-clock (RTC) renewable supply. This shift is driven by the fact that different renewable sources peak at different times, and Discoms need supply profiles that better match demand peaks while reducing balancing and market-purchase costs.

3.3.2 Tendering activities

Auction momentum is now the main channel for scaling utility-scale renewables

India's utility-scale RE build-out is increasingly being shaped by competitive auctions, with tendering volumes rising alongside higher national targets and a clear shift toward more reliable RE supply. Since

Fiscal 2021, more than 145 GW of utility-scale RE tenders have been completed across technologies, including hybrid and Complex tenders. This acceleration reflects a combination of larger government ambition, more innovative tender designs, discom preference for stable/firm power, and a broader rise in power-sector investment.

Tender volumes have outpaced targets as auctions become the default procurement route

Utility-scale tendering has exceeded the Government's annual benchmark of 50 GW (for Fiscal 2024), indicating that auctions have become the primary procurement mechanism for new capacity. During Fiscal 2025, around 49 GW of tenders were issued, and approximately 59% of this volume was for hybrid and firm/dispatchable renewable formats (including FDRE/RTC structures).

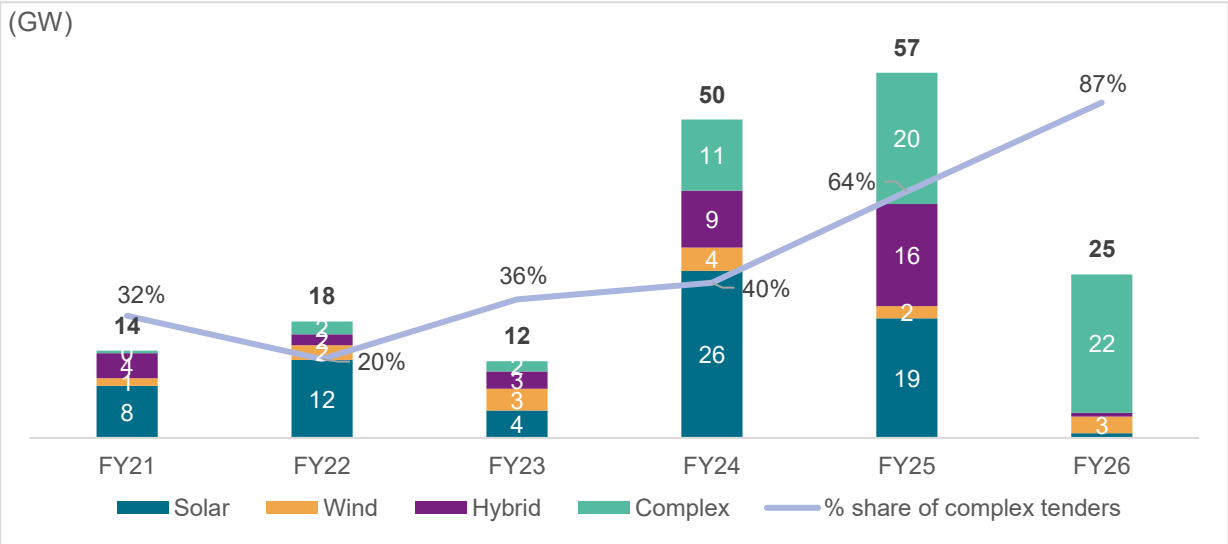
Complex hybrids are rapidly becoming the mainstream tender format

The share of Complex hybrid RE tenders increased from 31.68% in Fiscal 2021 to 63.91% in Fiscal 2025, and further to 86.94% in Fiscal 2026. This trend signals a procurement shift away from energy only contracting toward structures that deliver higher reliability and system value.

Storage tenders are scaling alongside RE auctions, reinforcing the shift toward firm power

In addition to renewable tenders, more than 60 GWh of standalone energy storage system (ESS) tenders (including pumped hydro storage) have been issued. Importantly, tender outcomes have remained strong: average allocations have been above 85% of tendered capacity over the last five years, suggesting sustained developer participation and improving market depth even as tender structures become more demanding.

Figure 23: RE tender auctioned capacity annually



Includes only utility scale tenders concluded during the year;
Source: Central and State nodal agencies, Crisil Intelligence

Storage adoption is being pulled by grid economics and pushed by policy creating a powerful convergence

Multiple forces are converging to make energy storage systems increasingly central. High renewable targets and rising demand increase variability and create value for peak shaving and curtailment reduction,

and time-of-day tariffs and sharper peak pricing strengthen the arbitrage and system-value case for storage. New tender structures such as firm power and peak power supply formats embed storage as a requirement to meet the offtaker's demand profile, accelerating adoption in a way that standalone market economics alone might not achieve at the same pace.

Falling battery prices are further improving competitiveness with global decline over the last decade alongside visible tariff declines in Indian auctions, including a fall in discovered charges from INR 1.084 million per MW per month in SECI's August 2022 tender to INR 0.448 million per MW per month in a Gujarat tender in March 2024.

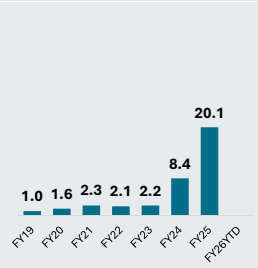
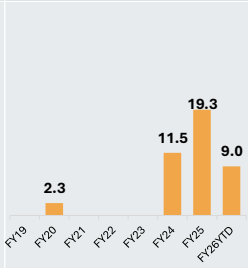
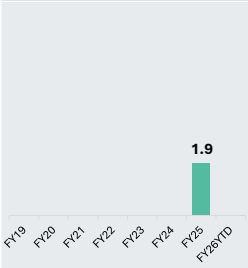
As per MoP, the cost of BESS discovered through tariff based competitive bidding during Fiscal 2023 was about INR 10.18 /kWh if the storage is used for 2 cycles daily. The cost of BESS discovered through competitive bidding Fiscal 2026 has substantially reduced to about INR 2.1 /kWh without viability gap funding (VGF), if the storage is used for 2 cycles daily. However, based on the market trend, it is expected that BESS will be utilised for 1.5 cycles per day which corresponds to storage cost of INR 2.8 /kWh. This, combined with the average tariff of INR ~2.5/kWh (based on recent tenders) renders a landed tariff of INR ~5.3/kWh, reinforcing that the commercial barrier is shrinking. At the same time, supportive policy measures, VGF support for large aggregate MWh targets, and PLI-backed domestic manufacturing are reducing risk and encouraging scale.

3.3.3 Competitiveness of tariffs of recently concluded Complex tenders

Higher dispatchability is achievable but it comes with a clear cost premium today

The higher generation quantum mandated by these tenders is typically achieved by adding storage, oversizing renewable capacity relative to contracted capacity, or combining both approaches. As a result, tariff ranges required to sustain equity IRRs of around 10–15% - similar to regular tenders - are expected to be higher than the INR 2.6–2.8/unit levels seen in plain-vanilla (single technology) bids (imported cell-based modules), moving toward roughly INR 3–5/unit, largely due to higher capex and opex from storage inclusion and/or larger installed capacity. Some moderation has been observed in RTC tenders where the stipulated escalation in tariff improves bankability, though tariff levels remain higher than plain-vanilla (single technology) benchmarks. Complex Projects (including Wind Solar Hybrid projects, and RTC/FDRE projects), are expected to have higher tariffs. The premiums are borne by the Discoms/end consumers. Due to higher capex and opex from storage inclusion and/or larger installed capacity required to meet the tender conditions, the tariffs are higher.

Table 6: Tariff range of INR 4-5 /kWh in mixed resource and new business model allocation rising

	Plain Hybrid	FDRE (Peak Power)	FDRE (RTC)	FDRE(Firm Power)
Weighted avg. tariff	INR 3.11 per unit	INR 4.34 per unit	INR 4.22 per unit	INR 4.98 per unit
Year of first allocation under structure				
Total allocation	38 GW	42 GW	13 GW	1.9 GW
Key Players	Juniper, Adani, JSW, Avaada	Renew, Avaada, ACME, Hero Future	Sembcorp, Greenko, Renew, NTPC	Sembcorp, Juniper, Renew, JSW, Hero Future
Key distinctive features	Plain vanilla hybrid tenders require simple blending of solar and wind resources to achieve higher PLFs compared to those achieved on standalone basis	Peak power tenders demand injection of renewable energy during peak periods of power demand in the day, typically 4 hours per day	Round the clock tenders are designed to enable injection of renewable energy asking for higher availability from the energy sources	Firm power tenders require availability of firm and dispatchable renewable power with multiple requirements across availability, peak timing supply and/ or following of a particular load profile

Note: Weighted average is calculated across all projects allocated under respective models till Fiscal 2026 YTD (April-January) from Fiscal 2019

Source: Crisil Intelligence

Due to their inherent complexity and additional requirements, Complex auctions have shown a wide range of tariffs. However, compared to plain vanilla (single technology) solar or wind, these tenders have discovered attractive tariffs indicating a premium is required to be paid for uninterrupted reliable power supply.

Table 7: List of Complex tenders concluded between Jan 2025 – Feb 2026

Sr No	Bidding scheme	Result month	Winning tariffs discovered (INR /unit)		Capacity (MW)		Winners
			Lowest	Highest	Tendered	Allotted	
1.	SECI Pan India Solar-Wind-Storage Hybrid (Firm Power) Tranche-VI	Jan 2025	8.50	8.50	2000	200	• O2 Power
2.	NHPC Pan India Solar-Storage Hybrid, 1,200 MW, 600 MW/ 1,200 MWh	Jan 2025	3.09	3.10	1200	1200	• NTPC RE • Jindal India RE • Rays Power Infra • Renew Solar Power • Adani RE Holding 9 • Onix Renewable
3.	SJVN Pan India Solar-Wind-Storage Hybrid (Firm Power)	Feb 2025	4.82	4.91	1200	448	• Renew Solar Power • Serentica Renewables • Tata Power RE • Enfinity Global • Dineshchandra Infracon
4.	SJVN Pan India Solar-Storage Hybrid, 1,200 MW, 600 MW/ 1,200 MWh	May 2025	3.32	3.33	1200	1200	• SAEL Industries, • Jindal India • Renewable Energy, • Sembcorp Green Infra Ltd., • JBM Renewables • Fastnote Biofuels (Hindustan Power)

Sr No	Bidding scheme	Result month	Winning tariffs discovered (INR /unit)		Capacity (MW)		Winners
			Lowest	Highest	Tendered	Allotted	
							• Reliance NU Energies
5.	NHPC Pan India Solar-Storage Hybrid, 1,200 MW, 600 MW/ 1,200 MWh	July 2025	3.13	3.13	1200	1200	• Reliance Infra • JBM Renewables • PNC Infratech • SAEL Industries • Navayuga Engg.
6.	TPC D Pan India Wind Solar Hybrid (Firm Power) 250 MW	August 2025	4.43	4.77	250	250	• Juniper Green Energy • Navayuga Engineering • ACME Solar Holdings • Tata Power RE
7.	RUMSL, (Solar+Storage) 600 MW 440 MW/880 MWh	Sept 2025	2.70	2.76	600	600	• Ceigall India • ACME Solar Holdings
8.	SECI pan India (Solar+Storage) 2000 MW 1000 MW/4000 MWh	Oct 2025	2.86	2.87	2000	1980	• Shivalaya Construction • Welspun Renewable Energy • MB Power • Oswal Cables • Purvah Green Power etc.
9.	REMCL, RTC Hybrid, 1000 MW	Nov 2025	4.35	4.35	1000	1000	• ACME Solar Holdings • ReNew Power • Bhalki Solar Power • Purvah Green Power • Jindal Green • Ayana Renewables
10.	SECI pan India (Solar+Storage) 1200 MW 600 MW/3600 MWh	Jan 2026	3.12	3.13	1200	1200	• NLC India RE • Engie Energy • Rays Power Infra • Oriana Power
11.	KREDL, Karnataka (Solar+Storage) 250 MW_{AC} 250 MW/1000 MWh	Feb 2026	5.51	5.51	250	250	• Pace Digitek

Source: Industry Reports, Press Releases by respective Companies, SECI, SJVN, NTPC etc. Crisil Intelligence

3.3.4 Challenges for RE capacity additions in India exists

India faces several challenges in scaling up renewable energy capacity additions. Land acquisition and the availability of suitable sites remain significant hurdles, especially as the best wind and solar locations are already being utilized. Grid integration and balancing are increasingly complex due to the variable nature of renewables, requiring substantial investments in transmission infrastructure and storage solutions. Delays in PPAs, regulatory uncertainties, and payment risks from financially stressed DISCOMs further hinder project bankability and timely execution. Additionally, financing constraints especially for smaller developers and the need for advanced technology adoption to improve efficiency and grid compatibility add to the complexity. Addressing these challenges is critical for India to meet its ambitious renewable energy targets and ensure a reliable, sustainable energy transition.

(i) Increased signing of selective PPAs favoring Firm/RTC, hybrid, and storage-backed PPAs

Many auctioned solar projects by SECI have faced delays in securing offtakers, resulting in unsigned PSAs. State discoms, the primary buyers, have increasingly postponed signing these agreements especially for projects with low tariffs (INR 2.3–2.5 per unit). This reluctance stems from a surge in bids, mismatches between demand and the project pipeline, and changing market conditions such as falling raw material prices.

From Fiscal 2019 to the first ten months of Fiscal 2026, about 126 GW of standalone/ single technology capacity was allocated through competitive bidding, with SECI accounting for 30.6%. Of SECI's allocations, 83% have completed PPA signing (~32 GW), 51% of which got commissioned but 40% remain in the pipeline and 9% have been cancelled. Delays are often linked to land and transmission challenges, and several projects received extensions from MNRE in late December 2022, further pushing timelines.

Therefore, tender design is increasingly becoming important to reduce offtake risk. Discoms are showing stronger acceptance of Firm/RTC and storage-backed procurement, because these structures better match demand peaks and reduce balancing and market purchase dependence. As a result, Complex tenders are achieving higher PSA/PPA conversion than plain-vanilla (single technology) energy only awards. Going forward, better tender structuring aligned to discom demand profiles (peak/seasonal needs), clearer delivery obligations, and bankable risk allocation will be key to improving signing discipline and reducing the build-up of uncontracted awarded capacity.

(ii) Connectivity, not project build, is now the binding constraint for utility-scale RE

Renewable energy projects are typically commissioned within 18–24 months, but grid connectivity is not keeping pace. The main bottleneck lies in limited bay availability and slow approvals at 220 kV and 400 kV ISTS substations, which restrict new connections. Transmission network expansion faces significant execution risks including right-of-way issues, forest clearances, and equipment supply constraints making project timelines unpredictable.

While ~60 GW of transmission connectivity is expected to be available by Fiscal 2027, RE commissioning is projected at ~75–80 GW by Fiscal 2027, implying that generation may be ready before evacuation capacity. The strain is even clearer in the pipeline: against an estimated ~230 GW ISTS integration requirement for the 500 GW target, connectivity granted or under process stands at 355.51 GW. Yet, as of August 31, 2025, available margins at ISTS (non-RE pooling) substations were only ~32 GW, suggesting that the easy connectivity is largely exhausted. In high-activity states such as Rajasthan, delayed network augmentation means a developer applying today may not get connectivity until Fiscal 2030.

Demand is crowded and concentrated among a few large developers

Connectivity demand is not evenly distributed. As of February 2026, total connectivity demand stood at 179 GW, with five players (Adani, ReNew, NTPC, Avaada and Serentica) accounting for 36% of requested capacity. Among C&I-led applicants, Serentica (6.6 GW) leads, followed by players such as Greenko, Mahindra, Sunsure and Aditya Birla. Practically, this concentration intensifies competition for scarce bays and accelerates queue risk, especially for smaller developers.

The impact shows up in schedules, waivers and growing curtailment risk

When evacuation infrastructure lags project commissioning, the market response has been visible in policy accommodations. Utility-scale projects have received two six-month COD extensions while retaining ISTS waiver eligibility, reflecting that delays are increasingly transmission-led rather than developer-led.

The same gap also increases curtailment risk. RE capacity can scale faster than the grid can absorb because transmission typically takes 2–4 years (or longer), while RE can be delivered in 18–24 months.

As a result, congestion-related backing down becomes more likely particularly in high-RE states directly affecting realised generation and revenues.

As tendering accelerates and project pipelines deepen, connectivity has become the critical gating factor and the balance between long-term GNA, and temporary arrangements is increasingly shaping execution timelines, curtailment outcomes, and investor risk.

While connectivity remains a key bottleneck, transmission expansion is being planned to match the 500+ GW integration pathway. CEA's report on Transmission System for Integration of over 500 GW RE Capacity by 2030 outlines planning for 537 GW RE integration, including ~50,890 ckm of ISTS lines and 433,575 MVA of substation capacity at an estimated INR 2,442 billion. CEA's National Electricity Plan (Volume II – Transmission), October 2024, further extends planning to Fiscal 2032, including large additions of lines, transformation capacity and HVDC systems, and estimates total transmission capex of INR 9.16 trillion over Fiscal 2022–2032.

(iii) As curtailment becomes more visible, enforcement and compensation mechanisms must-run and deemed generation become central to protecting project cashflows and investor confidence.

As renewable penetration rises in concentrated pockets, curtailment is no longer an occasional operating event; it is becoming a visible cashflow risk. Variable wind/solar output, forecasting error, and limited flexible balancing capacity (gas/hydro) can force system operators to back down RE to maintain grid parameters. In Fiscal 2026 (Mar–Oct 2025), curtailment of solar and wind was reported in Rajasthan, Gujarat, and Andhra Pradesh, underscoring that the risk is no longer theoretical.

In this environment, investor confidence increasingly hinges on whether curtailment translates into recoverable revenue. Regulatory protections exist: the Electricity (Promotion of Generation of Electricity from Must-Run Power Plant) Rules 2021 designate eligible RE plants as must-run and provide for compensation, where backing down is not permitted under the Grid Code. MNRE has reinforced this through tariff biding guidelines, and deviations typically require approval from the relevant Electricity Regulatory Commission to improve enforceability. Importantly, APTEL's September 9, 2025, judgment (Appeal No. 108 of 2018) strengthened the compensation principle by holding that backing down outside stipulated grid security criteria is not justified and attracts compensation. Project are planned in a timeline matching with that of evacuation infra, so that they do not require T-GNA but operates under GNA.

(iv) Fragmented land holdings make acquisition complex and slow for renewable projects

Land acquisition remains a significant challenge for renewable energy development in India due to the country's highly fragmented land ownership. Due to this, assembling large, contiguous parcels for utility-scale projects requires negotiating with numerous stakeholders. This complexity often leads to delays and increases the administrative burden, slowing down project execution.

The Solar Park Policy (September 2014) and state-led land banks are intended to centralise acquisition and pre-develop infrastructure. The planned land banks target 40,000 MW across 25 states, with implementing agencies developing 500–1,000 MW parks and central support of INR 2 million/MW for common infrastructure. This is expected to provide some relief with regard to land acquisition related issues.

(v) BESS is promising but today's projects must manage cost, safety, and execution risk

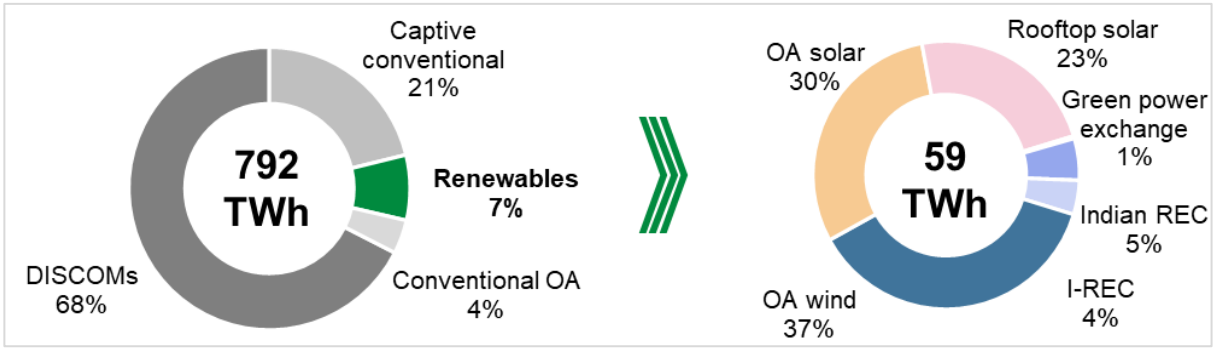
BESS technology has yet to reach its full potential in providing grid support services. It involves high investment costs and rapidly evolving technology, which introduces risks related to spares, performance, maintenance, and grid integration. Additionally, regulations governing the deployment of BESS and their safe integration with the grid are still evolving, impacting business operations. In India, the BESS landscape is at a nascent stage with very few utility scale projects executed. Upcoming projects may face inefficiencies or cost overruns on account of various challenges arising during the project execution. One of the biggest challenges associated with BESS is equipment safety and transportation, due to increasing temperature causing self-accelerating reactions leading to uncontrollable rise in temperature often resulting in fire or explosion, causing loss of battery containers and delay to projects execution and cost over-run. Temperature of BESS can rise due to temperature excursions, electrical faults, mechanical damage, manufacturing defects or other abnormal conditions. Generally, temperatures above 120 degree Celsius may represent the progression towards thermal runaway which may vary with cell chemistry, design, state of charge and operating conditions. However, large C&I and utility-scale containerized systems typically incorporate HVAC or liquid-cooling systems to maintain appropriate operating temperature and manage heat. Another challenge is right sizing of BESS for project optimization. Scarcity of skilled manpower is also a major risk to execute utility scale BESS project. Furthermore, batteries would require replacement or disposal after 12 to 15 years, depending upon usage.

3.4 Procurement routes in the C&I renewable market

3.4.1 Procurement routes

C&I consumers account for over 50% of the country's total power consumption, with the bulk of this demand met by discoms. Industries with substantial captive power needs, such as metals, oil and gas, and cement, have been slower to adopt renewable OA, largely due to the availability of low-cost thermal power and heavy legacy investments in captive thermal plants. Nevertheless, the share of captive conventional power in total corporate consumption dropped from 30% in Fiscal 2019 to 21% in Fiscal 2023. Meanwhile, direct RE procurement by C&I consumers (i.e., renewable energy penetration for C&I) rose sharply from just 4% in Fiscal 2019 to about 7.4% in Fiscal 2023. The RE consumption in India grew at a CAGR of 12.6% between Fiscal 2019 – 2023, whereas RE consumption by C&I saw a significantly higher growth rate of about 24.3% during the same period.

Figure 24: C&I power consumption and split of RE procurement at the national level, Fiscal 2023



OA: Open access, REC: Renewable Energy Certificate, I-REC: International Renewable Energy Certificate

Source: State tariff orders, CEA, Crisil Intelligence

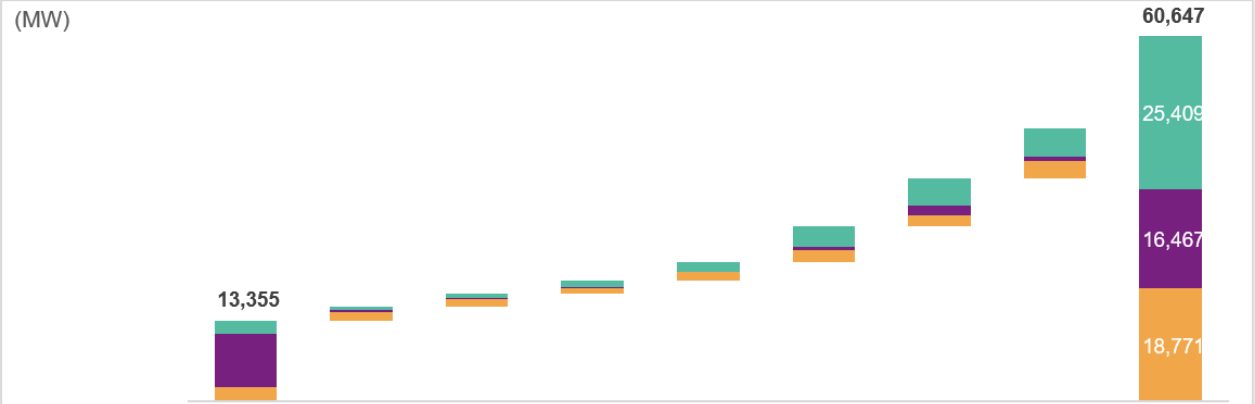
The pace of C&I renewable adoption varies widely across states, reflecting different levels of market maturity, different levels of industrialization, and different levels of wind resource/ solar irradiation in each state. Karnataka and Tamil Nadu, with their well-established OA policies, continue to lead. However, the

introduction of Green Energy Open Access Rules 2022, coupled with falling renewable costs and improving policy frameworks, is now spurring strong momentum in several states.

OA capacity additions were historically supported by incentives on OA charges. However, the withdrawal of such incentives slowed down growth between Fiscals 2019 and 2022 due to volatility in solar module prices as well as policy/ regulatory flip-flops (ALMM, state OA stance, etc.). However, since Fiscal 2023, momentum on OA capacity additions has significantly improved, led by strong interest from corporate consumers. OA capacity additions averaged 8.01 GW in the last two Fiscals. Total OA renewable capacity as of March 2026 was estimated at 41.88 GW, with robust growth expected in the next five years.

In the rooftop solar market, growth also picked up in the last 1-2 years, with 2.9 GW added in Fiscal 2025 alone. As of March 2025, total C&I rooftop solar capacity was estimated at ~14.2 GW with the OPEX segment accounting for 19% of total capacity. Further, as of March 2026, the total C&I rooftop solar capacity was estimated at ~15.3 GW.

Figure 25: C&I renewable capacity addition trend (MW)



	Until FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26 Total
Total	13,355	15,761	17,886	20,048	23,196	29,079	37,064	45,390	60,647
OA solar	2,089	619	700	972	1,569	3,367	4,542	4,704	25,409
OA wind	8,876	215	230	270	150	502	1,673	679	16,467
Rooftop solar	2,390	1,572	1,195	920	1,429	2,014	1,770	2,943	18,771

Source: State tariff orders, CEA, Crisil Intelligence

Rooftop solar is typically the first RE procurement route considered by corporates due to its low cost, scale, and asset control. It is generally followed by the OA route to reduce power procurement costs and/or achieve sustainability goals.

(i) Rooftop or onsite solar

Rooftop and onsite ground-mounted solar installations are a preferred RE option for C&I consumers with adequate space, offering 10-15% RE offset without the need for external land or transmission infrastructure. Adoption is supported by simple regulatory processes and proven implementation models across states, with metering structures such as net metering, gross metering or behind-the-meter systems.

C&I consumers typically choose between two models:

- Capex model (dominant): Consumers invest upfront and benefit from lower tariffs due to GST credits and accelerated depreciation, but bear performance and maintenance risk

- Opex/RESCO model: Popular with large consumers due to zero capex, risk transferred to the developer and assured savings, but limited by the need for creditworthy, large-scale offtakers

(ii) InSTS connected RE projects

OA allows consumers to procure power directly from any power generator across the country. The route is suitable for consumers looking to procure a higher quantum of renewable power as there are no space constraints. Consumers may install renewable power projects themselves on a 100% captive basis, but procurement from IPPs under long-term 'group captive' PPAs is the most popular option.

Table 8: Key features of different OA business models

Particulars	100% capex	'Group' captive	Third-party sale
Key features	• Customer owns 100%, developer builds and operates • Consumer makes the entire upfront capital investment	• Customer owns minimum 26%, developer owns 74% or lower builds and operates • A third-party IPP may own the remaining equity and take all responsibility for developing and operating the power plant; consumers buy power from IPP as per a mutually agreed PPA	• Owned, built, and operated 100% by developer • Consumers buy power from IPPs under a mutually agreed PPA
Benefits	• Streamlined project approval process • Competitive PPA price offered under the group captive model • Exemption from CSS and AS accounting for about Rs 1.30-2.50/kWh under the group captive model • Tax incentives available under 100% captive model		• No upfront capital needed by consumer • No annual compliance requirements
Disadvantages	• Upfront capital investment required • Consumer(s) forego profits or dividends, which are adjusted in tariff • Annual compliance requirements to prove captive status		• Higher PPA price • Higher landed cost due to applicability of OA charges

Source: Crisil Intelligence

The MoP issued final green open rules in Fiscal 2023, which are desirable for consumers, and most of the major states have already adopted these. These rules allow small consumers with sanctioned loads over 100 kW to be eligible for OA with banking provisions subject to an annual cap of 30% of power consumed from the local discom. The rules propose that OA applications be approved within 15 days and that a uniform methodology for calculating OA charges be followed across all states. This is expected to propel capacity additions under this route over the medium to long term.

(iii) Inter-state transmission system (ISTS)-connected projects

CTU- or ISTS-connected projects can supply power throughout India by using the national grid network. These projects enable developers to support pan-India operations for corporate customers in multiple ways. Customers with multiple facilities across states can aggregate demand to purchase electricity under a combined PPA; customers with facilities in states where STU-connected projects are not viable or feasible can access power through CTU-connected projects; and customers that wish to contract energy attributes through EAPAs without purchasing physical electricity. EAPAs are contracts that require developers to unbundle energy attributes and sell them to C&I consumers, often registered as I-RECs/RECs. The electricity generated from these projects is sold either on power exchanges in India or to other brown power PPA consumers.

There are two key categories of C&I customers that benefit from ISTS power:

1. Large manufacturing facilities in states without adequate renewable potential or high intrastate OA costs or policy landscape (e.g., Jharkhand, Odisha, UP, WB and Northeast)
2. Data centre and technology companies are purchasing environmental attributes generated from green power in India to meet RE commitments for their operations in India and the broader Asia-Pacific region

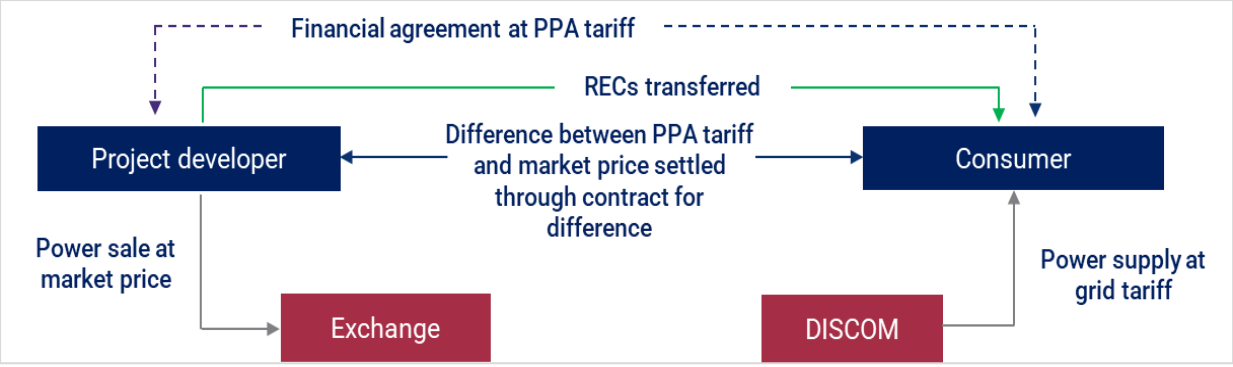
The OA market has historically been limited to intra-state projects, where both the renewable project and the consumer are located within the same state. However, the market is exploring inter-state projects given ISTS waiver (25% reduction starting July 1, 2025, and a full phase-out by Fiscal 2028) for OA projects, which is typically INR 0.50-0.80/kWh for a 25-year period for projects commissioned by June 2025.

ISTS-based OA power continues to offer a cost advantage for large C&I consumers, even after factoring in ISTS charges and losses of INR 0.20-0.25/kWh (assuming a 75% waiver on ISTS charges). Despite this adjustment, the landed cost of ISTS power is still INR 0.10-0.20/kWh lower than comparable intra-state OA. Customers already operating under intra-state OA arrangements particularly in states with favourable banking or OA policies – are likely to continue with existing set-ups due to operational familiarity and policy stability. However, ISTS remains an attractive alternative for new buyers, those looking to diversify procurement across geographies, or entities in states where intra-state OA is constrained by regulatory barriers or higher charges.

(iv) Virtual power purchase agreements

In a VPPA, a buyer contracts to purchase Renewable Energy Power at a predetermined price, without physically receiving energy. In a VPPA framework, an agreement is reached for the sale of RECs to the consumer at a mutually agreed price, and brown power is sold on the exchange with a contract for difference. Essentially, through a VPPA including EAPA, corporates support set-up of RE projects and, in turn, retain the green attributes (RECs). It also allows consumers to purchase green attributes such as RECs while continuing to buy power from discoms or other sources. This framework also provides consumers and developers with a hedge against power price volatility to the extent of the strike price or cap/floor. The industry is exploring this option, experimenting with some variants of VPPAs.

Figure 26: VPPA transaction structure



Source: Crisil intelligence

CERC has recently released draft guidelines for VPPAs in India. As per the guidelines, Indian RECs are allowed to be transferred without any cost and without a power trader. CERC has also recognised that both parties may directly settle the difference between market and strike price according to a mutually agreed contract. As per the above framework, parties do not require any derivative contracts to complete a VPPA. Hence, full jurisdiction of such contracts remains with CERC under REC Regulations, Power Market Regulations, and Grant of Trading License Regulations, ending years of uncertainty for the sector.

VPPAs emerge as a commercially attractive option for C&I consumers, particularly when linked to ISTS-connected RE projects. Unlike green tariffs, which involve a fixed premium over grid power and offer limited pricing transparency, VPPAs allow for greater cost control and potential savings, especially under favourable market conditions.

C&I consumers are also increasingly adopting EAPAs and other green attribute contracting structures to meet their sustainability goals. By combining VPPAs with RECs, corporates can make credible progress towards their 100% RE and Scope 2 reduction goals without relying on physical OA or state-level grid connectivity. While VPPAs are fundamentally structured as cost-plus instruments for acquiring green attributes, they can become cost-neutral or even cost-saving depending on the strike price versus real-time market prices. Since green tariffs often carry premiums of INR 0.50-1.00/kWh over grid tariffs and are subject to regulatory variability, VPPAs offer not just greater flexibility and long-term visibility, but also a more commercially viable route for companies seeking to decarbonise at scale, particularly across multiple states. This makes VPPAs especially attractive for large, creditworthy consumers that may not have access to physical OA but still want to demonstrate credible, reportable RE procurement.

(v) Power exchanges

The power exchange market in India, specifically the Green Term-Ahead Market (G-TAM) and Green Day-Ahead Market (G-DAM), provides consumers with opportunities to buy and sell renewable power on a short-term basis. G-TAM allows bilateral purchase of power for delivery duration up to one week, with options for same-day, next-day, next-week, or next 10 days contracts. In contrast, G-DAM enables trading of power through a closed online auction process for delivery on the next day. Green attributes are embedded with traded power to avoid double counting, ensuring the integrity of the market.

187.20 lakh RECs were traded during Fiscal 2026 on IEX. REC traded volume in Fiscal 2026 increased by 5% on y-o-y basis. Average clearing price on the green exchange in Fiscal 2026 was at INR 4.35/kWh compared with INR 3.70/kWh on the conventional DAM market, implying a premium of INR 0.65/kWh for green attributes.

(vi) Green tariffs

A green tariff is a special power tariff determined by state regulators for consumers that want to purchase renewable power. It is a simple procurement route that does not require any changes in physical procurement, metering, or infrastructure, making it attractive to consumers that are averse to relatively complex procurement options such as OA. All consumers are eligible to procure power from the local discom at green tariffs, but it entails an extra cost (over and above the respective consumer category grid tariff), which is a deterrent for many. The green tariff premium calculation methodology is arbitrary and lacks visibility, and the green attributes are not transferred to the consumer but rather retained by the discom [for non-obligated entities and over renewable purchase obligation (RPO) targets of obligated entities] that uses them to meet its RPO targets.

Despite their operational simplicity, the uptake of green tariffs has been poor due to the high cost, which is set at a premium of 5-10% over grid tariffs. Some states, such as Karnataka, transfer green attributes to obligated entities only, but this is not a standard practice. Overall, the green tariff has remained a non-starter due to its high cost and lack of clarity over green attributes.

3.4.2 Key growth themes driving RE demand among C&I consumers

Policies and regulations drive growth in the open access market

Policies and regulations are fueling growth in India's open access market. Captive and group captive models allow corporate consumers to collectively own and use power plants, with rules requiring at least 26% ownership and 51% consumption of generated power. Recent amendments and Supreme Court rulings have clarified eligibility and proportionality, making group captive the preferred route due to minimal investment and exemption from open access charges.

The Green Energy Open Access (GEOA) rules now let consumers with a contract demand of 100 kW or more access renewable energy, including smaller groups pooling demand. Open access enables bulk procurement at lower costs, making it popular among corporates. Third-party open access consumers pay various network charges, but national policies cap cross-subsidy surcharges and exempt captive users, improving cost viability. Captive and group captive projects are especially attractive as they avoid these surcharges entirely. Monthly banking provisions allow surplus renewable energy to be credited, with unutilised energy converted to RECs. The rules also ensure timely project approvals and provide clarity on charges.

Growth in manufacturing under Make in India and PLI prompting RE adoption

India's push for domestic manufacturing through initiatives like Make in India and the Production Linked Incentive (PLI) scheme has spurred a shift toward renewable energy (RE). As electricity costs make up a significant portion of manufacturing expenses, companies are increasingly turning to solar and wind power to remain competitive and sustainable.

Offsetting global and regional emissions through OA projects in India

International corporations operating in India are also investing in renewable energy to meet both local and global sustainability targets. India's low levelised cost of energy and the availability of instruments like I-RECs make it an attractive destination for such investments, with companies like Amazon and Microsoft leading the way.

Implementation of Carbon Border Adjustment Mechanism

The upcoming implementation of the European Union's Carbon Border Adjustment Mechanism (CBAM) in 2026 is prompting Indian exporters in sectors such as cement, steel, and chemicals to adopt renewable energy and set ambitious net-zero targets to avoid future carbon taxes and maintain market access.

Infrastructure growth and electrification in sectors such as airports and metro systems

Infrastructure expansion, particularly in airports, metro systems, and smart cities, is driving further demand for clean energy. These projects, often mandated by government policies, require reliable, round-the-clock renewable power and are exploring innovative procurement models and energy storage solutions. Also, corporates constituting ~50% of the power demand in India - and move towards adopting RE especially in hard to abate industries to drive RE demand via Complex/FDRE tenders.

Impending launch of a national carbon market

The launch of a national carbon market, under the Carbon Credit Trading Scheme (CCTS), will set emission intensity targets for high-emission industries and introduce tradable carbon credits. This framework incentivizes emission reductions and creates a transparent market for carbon performance, with penalties for non-compliance.

Growing demand for green hydrogen

The growing focus on green hydrogen is fueling additional renewable energy demand. States are rolling out policies to support green hydrogen projects, and international partnerships, such as the Keppel Infrastructure-Greenko deal, are emerging to build large-scale facilities powered by renewables. India aims to produce 5 million tonnes of green hydrogen by 2030, further deepening the country's commitment to clean energy.

Emerging sectors including AI, cloud computing and data centres – new growth theme in the sector

Emerging sectors such as AI, cloud computing, and data centres are rapidly increasing their use of renewable energy, motivated by sustainability goals, reputational benefits, and long-term cost savings. The surge in digital services and AI adoption has led to a sharp rise in data centre capacity, with electricity costs making up 30-40% of operating expenses. As a result, operators are turning to renewables to manage costs and reduce emissions.

AI's mainstream adoption, with advanced models like GPT-4 and Gemini 1.5, is driving unprecedented demand for data processing and power, making data centres a key focus for infrastructure investment and environmental management. India is becoming a major global data centre hub, fueled by rising internet use, digital payments, and the localisation of cloud and AI services. Data centre capacity is projected to grow from 1.1 GW in 2023 to 5.4 GW by 2030, with Mumbai, Hyderabad, Chennai, and NCR emerging as hyperscale clusters. This growth is supported by submarine cable connectivity, favourable state policies, strategic land banks, and robust fibre infrastructure.

3.4.3 Key challenges

Regulatory challenges: cost volatility and complexity for open access

Open access economics remain exposed to regulatory volatility because several components of the applicable charges are revised periodically by state commissions and, in many states, have trended upward. While

transmission and wheeling charges are relatively stable (with a few state-specific exceptions), rising cross-subsidy and other pass-through levies increase the landed cost of renewable power and can steadily erode the savings C&I consumers expect from OA procurement.

Policy design provides partial relief but also adds complexity. Cross-subsidy surcharge (CSS) is capped at 20% of the average cost of supply (ACoS) for industrial consumers and is waived for group captive users, while additional surcharge is waived if fixed charges are paid and is generally not applicable to group captive projects. In structures priced as a fixed discount to discom tariffs, CSS movement can sometimes be directionally helpful, but in most cases the unpredictability of revisions makes long-term cost forecasting harder, especially for I-REC-linked strategies that depend on stable delivered tariffs.

Regulatory risk is amplified by the steady introduction of new, state-specific OA levies that dilute project economics and increase compliance overhead. Examples include Gujarat's additional wheeling charge for hybrid projects, Madhya Pradesh's Harit Urja Tax, and various grid support/parallel operation charges that in some cases are aimed at captive arrangements. These add layers of uncertainty and complicate the tariff comparisons across states.

Captive and group captive models remain the preferred route for many corporates because of surcharge exemptions, but that same advantage has increased discom scrutiny and the consequences of non-compliance. The Electricity Rules, 2005 govern eligibility and the Supreme Court judgment dated October 9, 2023, further tightened interpretational flexibility, increasing the importance of continuous monitoring, documentation, and governance to preserve captive status and the project's financial viability.

On March 13, 2026, the Ministry of Power notified amendments to Rule 3 of the Electricity Rules, 2005. These amendments significantly ease compliance and resolve structural ambiguities for group captive renewable energy projects. They modernize captive regulations for C&I consumers.

Contractual Challenges: Aligning Tenors, Structures, and Enforcement

Bankability in the C&I OA market is often constrained by tenor and structure mismatches. PPAs may run 15–25 years, but financing tenors and amortisation profiles do not always align neatly with contracted offtake, which can reduce lender comfort on long-term cash-flow visibility and lead to more conservative terms or pricing. Even when underlying demand is supported by a discount to grid tariffs, lenders typically require clear line of sight to contracted revenues over the period that matters for debt service.

Another friction point is the absence of standardisation. Unlike government tenders where RfPs include broadly standard PPAs, OA PPAs are frequently bespoke. This increases negotiation time and cost, creates inconsistent risk allocation across deals, and makes outcomes less predictable especially when non-standard clauses govern change-in-law, termination compensation, and dispute resolution. The result is slower replication and a higher barrier for more risk-averse investors, limiting scale-up of C&I projects.

Enforcement and interpretation risks remain material. Differences in contract language, evolving regulations, and varying interpretations of regulatory provisions can trigger disputes or delay remedies even after execution. This uncertainty weakens the role of the PPA as a dependable anchor for project finance and, by extension, for consistent revenue generation.

Operational Challenges: Resource Variability and Grid Integration Risks

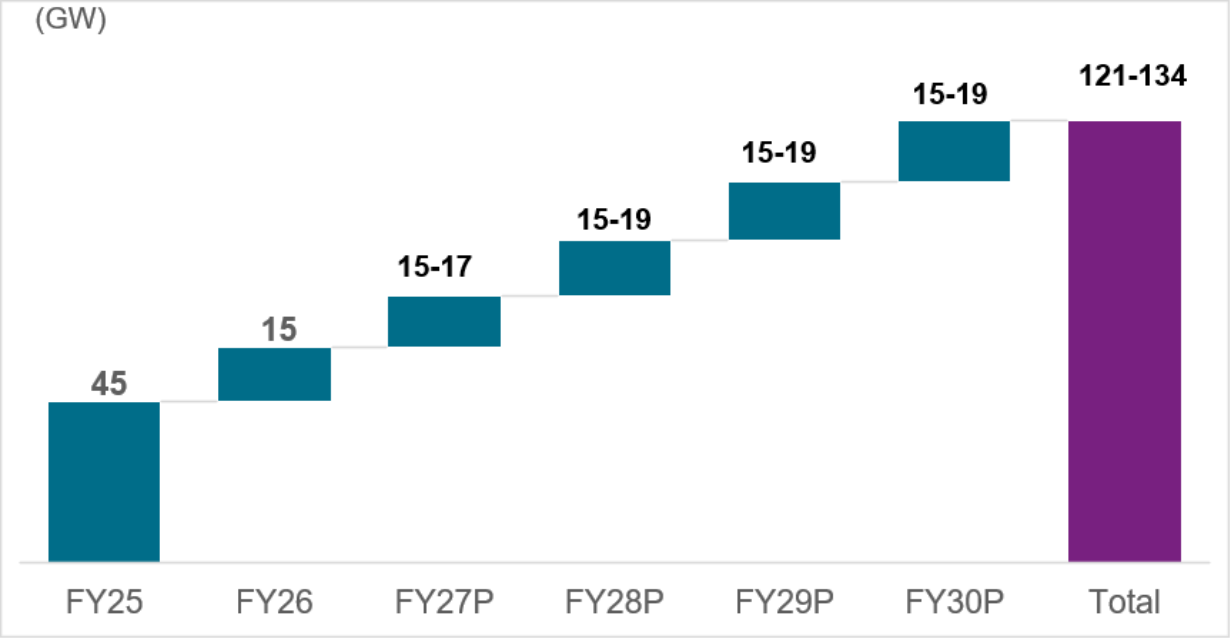
Operational performance can diverge from projections due to the inherent variability of wind and solar resources, with extreme weather increasing volatility. Lower generation directly impacts merchanted energy volumes, contracted deliveries, and revenue, while equipment failures or extended downtime can compound revenue impacts. This places a premium on strong O&M practices and conservative assumptions during project sizing and financial modelling.

Grid integration risk is particularly acute in RE-rich states where transmission constraints and local congestion can lead to curtailment during periods of oversupply. Standalone/single technology solar is often more exposed because generation peaks are highly coincident across plants, whereas wind or wind-solar-hybrid (WSH) configurations can smooth profiles and reduce simultaneous stress on the grid. Curtailment reduces deliverable energy, weakening returns unless mitigated through careful site selection, grid due diligence, and clear contractual allocation of curtailment risk.

3.4.4 Overall market outlook

Crisil Intelligence projects strong capacity additions from the C&I segment over the next five years. Total corporate renewable installed capacity is expected to grow at a CAGR of 22–24%, from an estimated 45 GW as of March 2025 to 121–134 GW by Fiscal 2030. This build-out is expected to be driven largely by state transmission utility (STU)-connected projects, particularly in solar- and wind-rich states.

Figure 27: Projected C&I renewable capacity in MW



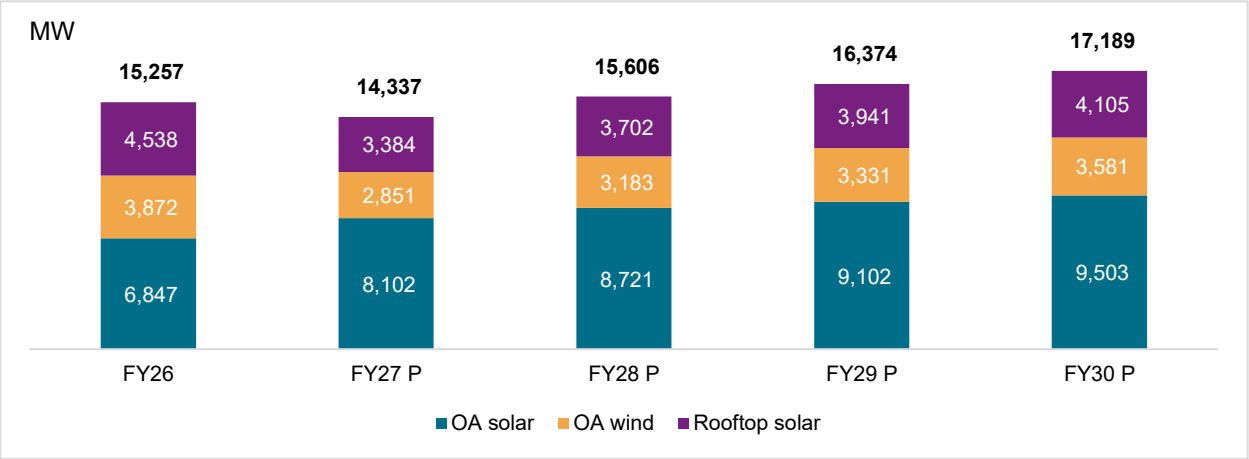
Note: All numbers are shown on an MW AC basis. To convert to DC capacity, a multiplier of 1.4x may be assumed. P: Projected; Source: Crisil Intelligence

OA solar to lead capacity additions; wind power projects to gather pace

Over the next five years, installations are expected to be carried out via the OA model, which is estimated to account for nearly 76% of the additions, or 57 GW. The balance is expected to come from the rooftop solar segment, which is likely to witness additions of ~18 GW, growing steadily with annual additions of 3-4 GW. Within OA, solar power is expected to be the dominant technology going forward. However, wind power is becoming crucial in balancing the intermittent solar power output. Annual OA wind power capacity addition, which has averaged 973 MW in the last five years, is expected to significantly pick up going

forward, rising to about 4 GW by Fiscal 2030. Overall, the share of wind power is expected to be 20-30% in total OA capacity addition.

Figure 28: Annual capacity projections (by technology, MW)



Note: All numbers in the chart are shown on MW AC basis, unless stated otherwise. For conversion of solar capacity to DC capacity, an approximate DC:AC factor of 1.4:1.0 may be assumed; P: Projected; Source: Crisil Intelligence

3.5 Overview of Indian merchant power market

Building on the procurement routes discussed for the Utility (discom/REIA-led tenders and long-term PPAs) and C&I (rooftop, open access/group captive, ISTS-enabled contracts and VPPAs) segments, the merchant market is increasingly emerging as the third route for renewable power monetisation in India. This route is anchored in short-term and spot market sales through power exchanges and other market-based contracts, allowing generators and buyers to match procurement with real-time system needs rather than locking into long-tenor arrangements.

As procurement evolves from energy only contracting to profile and firmness linked procurement, Complex tenders such as FDRE/RTC and storage-backed hybrids are expanding the overall RE pipeline but also raising execution and offtake complexity (timelines, grid integration, and buyer willingness to sign long-term PSAs at premium tariffs). In this context, the merchant market is emerging as a key avenue to absorb incremental renewable generation, support dispatch optimisation, and provide an additional bankable pathway especially for projects that are designed to be more flexible or partially contracted.

3.5.1 Merchant power market analysis

The power exchange now offers a menu of products that match different time horizons and compliance needs

The merchant power market in India has moved well beyond being a marginal supplement to long-term PPAs, as rising demand, growing renewable variability, and stronger market-based mechanisms push more volume into short-term contracting. This shift sets the context for understanding the exchange ecosystem: participants are no longer choosing between exchange or bilateral in general terms but selecting specific products such as day-ahead, green day-ahead, and real-time based on their risk appetite, portfolio shape, and operational flexibility.

Power exchanges enable buyers and sellers to align procurement and sales with how the grid actually behaves forecasting for tomorrow, adjusting within the day, or specifically sourcing renewable power. The

product suite has expanded to serve these distinct needs, the closer trading moves to real time, the more it becomes about balancing and flexibility rather than pure price discovery

Day-ahead trading remains the backbone for next-day scheduling and price discovery

The Day Ahead Market (DAM) functions as a physical electricity trading platform built around 15-minute contracts, enabling market participants to buy and sell electricity for delivery across 15-minute time blocks for the 24 hours of the next day. Price and traded volume are discovered through an anonymous double-sided auction process, after which transaction execution depends on operational clearance from the relevant State Load Dispatch Centre (SLDC), subject to network availability. In practical terms, DAM remains the core product for participants who want next-day certainty while still benefiting from competitive price discovery.

Green day-ahead trading separates renewable procurement into a dedicated, day-ahead market

The Green Day Ahead Market (GDAM) extends the day-ahead structure specifically to renewable electricity, creating a marketplace designed for buyers seeking renewable procurement and sellers looking to monetise renewable generation on a short-term basis. Participation is defined by eligibility rules that reflect renewable verification and scheduling controls: sellers include renewable generators and Discoms, subject to issuance of NoC or standing clearance by RLDC/SLDCs that specifies the renewable source type and other details including maximum permissible quantum under applicable regulations, while renewable generators registered under the REC mechanism are not eligible. On the demand side, buyers are entities eligible to procure power through Open Access, positioning GDAM as an increasingly important instrument as compliance and voluntary green procurement both grow.

Term-ahead market enables short-term procurement through contracts beyond the day-ahead horizon

The Term-Ahead Market (TAM) facilitates electricity trading for delivery beyond the day-ahead timeframe, typically ranging from intra-week to weekly contracts. It provides market participants with greater flexibility to manage short-term demand and supply imbalances while securing power for a defined delivery period. Trading in TAM is conducted through contracts such as intraday, day-ahead contingency, and weekly contracts, allowing buyers and sellers to plan procurement and generation schedules with improved certainty. Similar to other exchange-based products, prices are discovered through transparent market mechanisms, enabling efficient price signals while supporting operational flexibility for generators, distribution companies, and open access consumers.

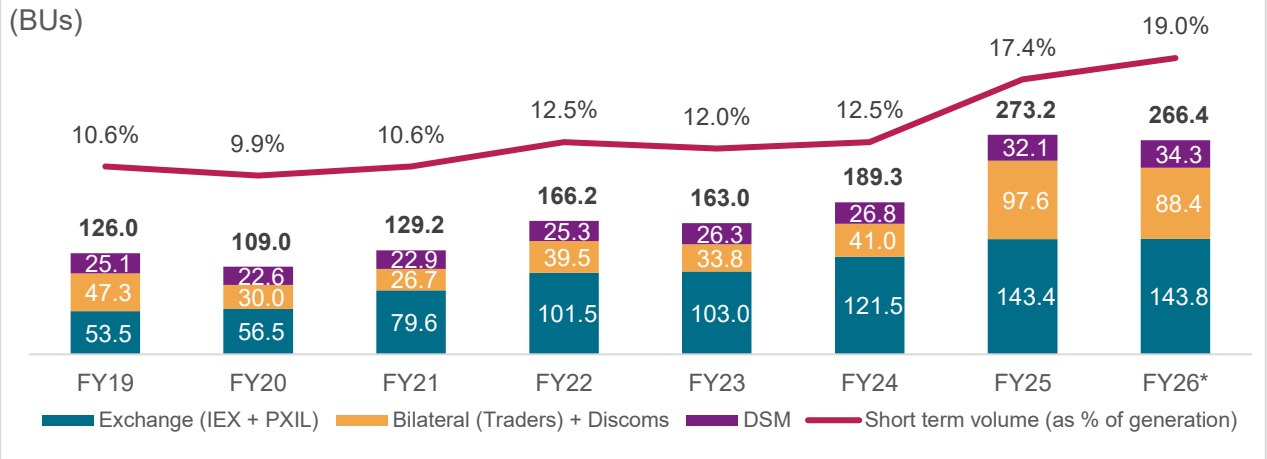
3.5.2 Volume of short-term transactions

Short-term power volumes have expanded sharply, confirming a gradual shift toward market-based procurement

India's short-term electricity transactions have increased from 65.90 BUs in Fiscal 2010 to an all-time high of 273.16 BUs in Fiscal 2025, reflecting rising power demand, regulatory movement toward market-based mechanisms, and the need for Discoms to optimise power purchase costs. Importantly, over Fiscal 2019–2025, short-term transaction volumes grew at a 13.77% CAGR, significantly faster than total electricity generation at a 4.80% CAGR, showing that the short-term market is taking a larger role rather than merely growing in line with the system. The share of short-term transactions as a proportion of total generation ranged between ~10.60% and 12.50% during Fiscal 2019 to Fiscal 2024, before rising to 17.37% in Fiscal 2025, underscoring an acceleration in reliance on short-duration procurement and sales. Within this

expansion, power exchanges have been gaining prominence: exchange-based volumes rose from ~53.52 BU in Fiscal 2019 to ~143.44 BU in Fiscal 2025 (a 17.86% CAGR), and in Fiscal 2025 exchanges accounted for 52.51% of total short-term transactions, compared with 35.72% through bilateral transactions and 11.77% through DSM transactions.

Figure 29: Volume of short-term transactions (in BU)



**From April 2025 to February 2026;*

Source: CERC Market Monitoring Report, Crisil Intelligence

As exchanges proliferate and products diversify, trade is shifting from DAM dominance to a more balanced mix

Transactions through power exchanges take place across three exchanges Indian Energy Exchange (IEX), Power Exchange India Limited (PXIL), and Hindustan Power Exchange (HPX) with IEX remaining the dominant platform, accounting for 84.06% of total power exchange transactions in Fiscal 2025, followed by PXIL at 9.82% and HPX at 6.12%. The deeper structural change, however, is not only where volumes trade but how: since exchanges began operations in 2008, product offerings have widened beyond DAM to include RTM and TAM and newer products such as GDAM, GTAM, HPDAM, and HPTAM. As a result, DAM's share has fallen materially from being the overwhelmingly dominant product earlier to 42.73% in Fiscal 2025 (down from 76.1% in Fiscal 2021), while RTM's share expanded from 11.90% in Fiscal 2021 to 27.19% in Fiscal 2025, and TAM's share increased from 6.28% in Fiscal 2019 to 22.86% in Fiscal 2025. This redistribution of volumes signals a market that is increasingly shaped by flexibility needs, renewable integration, and a preference for procurement structures that better match real operating conditions rather than a single next day clearing mechanism.

Table 9: Share of various trade modes in power exchange (BUs)

Market	Fiscal 2019	Fiscal 2020	Fiscal 2021	Fiscal 2022	Fiscal 2023	Fiscal 2024	Fiscal 2025	Apr-Feb 2026
DAM	50.2	49.2	60.6	65.2	51.4	53.5	61.3	56.2
GDAM	0.0	0.0	0.0	0.9	3.8	2.5	8.3	9.5
HPDAM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RTM	0.0	0.0	9.5	19.9	24.2	30.2	39.0	49.7
TAM	3.4	7.3	8.7	10.0	21.0	33.0	32.8	26.7
GTAM	0.0	0.0	0.8	5.5	2.6	1.4	1.6	1.4
HPTAM	0.0	0.0	0.0	0.0	0.0	0.8	0.4	0.2
Total	**53.51**	**56.45**	**79.60**	**101.45**	**102.96**	**121.49**	**143.44**	**143.77**

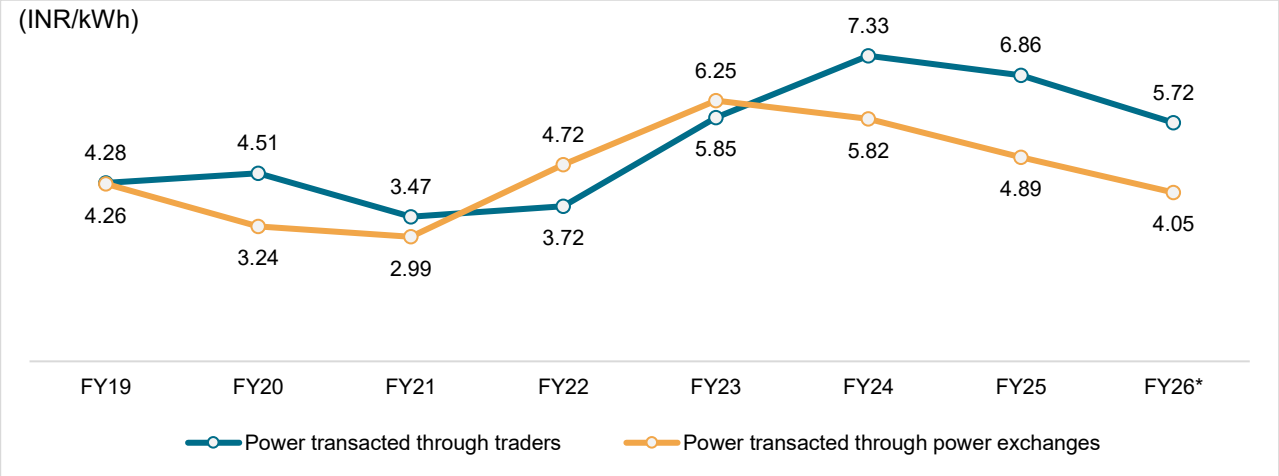
Source: CERC Market Monitoring Report, Crisil Intelligence

3.5.3 Weighted average tariff of short-term transactions

Prices reveal why exchanges matter: they have generally cleared below trader-linked procurement

Over the years, the weighted average price of electricity transacted through traders was higher than the price of electricity transacted through power exchanges, except in Fiscal 2022 and Fiscal 2023 when the price at power exchanges was comparatively high due to various domestic and global factors.

Figure 30: Weighted average tariff of short-term transactions



**From April 2025 to February 2026;*

Source: CERC Market Monitoring Report, Crisil Intelligence

3.5.4 Outlook on tariffs for short-term transactions

Short-term markets are becoming the default lever for cost optimization

Conventional sources, primarily coal, dominated the exchange market with a ~85% share in Fiscal 2025. Coal prices surged in Fiscal 2022 and Fiscal 2023 due to global price hikes and increased industrial activity post-COVID. However, improved domestic coal production and stock management have eased availability concerns in Fiscal 2025. Thermal project PLFs are expected to rise to 75-80%, enabling coal projects to recover costs. Despite increased renewable energy penetration pressuring power prices, coal-based power will remain dominant. Crisil Intelligence expects the weighted average exchange tariff to increase moderately from INR 4.69/kWh in Fiscal 2022 to INR 5.01/kWh in Fiscal 2050, at a 0.2% CAGR.

India's power exchange market has become a key route for short-term power sales/procurement, offering multiple products: DAM for next-day hourly blocks; RTM for near-real-time balancing/last-mile procurement; TAM (including intraday/day-ahead contingency/weekly products) for short-duration forward coverage; and Green DAM and Green TAM for renewable energy procurement and compliance strategies. Short-term market share in India's overall electricity volume has been rising gradually, reaching ~17.4% in Fiscal 2025 per CERC's short-term market tracking, up from ~10.6% in Fiscal 2019. Discoms and C&I (open access) consumers increasingly prefer exchange-based short-term procurement to optimize costs using DAM for planned replacement of costlier legacy power, RTM for deviation management and demand surprises, and Green products to meet renewable/ESG needs; Softer clearing prices enabled Discoms and C&I consumers to meet demand competitively and substitute higher-cost power via exchanges.

Key Takeaways

a) Global renewable energy capacity has surged to nearly 5.7 TW, with solar and wind leading new additions. China, the US, and India dominate this growth, with India emerging as a major capacity hub.
b) Costs for wind and solar continue to fall, but the market is shifting from lowest tariffs to reliable, grid-aligned power. Hybrid, RTC, and storage-linked projects are becoming central to procurement.
c) India's robust policy framework tightened RPOs, open access reforms, and improved payment discipline is driving large-scale deployment and attracting investment.
d) Execution bottlenecks, especially in transmission connectivity, curtailment, and land acquisition, are now the main constraints to growth. Addressing these is critical for meeting targets.
e) Corporate procurement and short-term power markets are gaining importance, with C&I consumers and discoms increasingly using open access, VPPAs, and exchanges for cost optimisation and renewable integration.

4 Risk and challenges

4.1 Threats

- Any adverse shift in government policies, including reductions in incentives or changes in energy regulations, can significantly impact revenue and profitability of renewable energy project developers. However, considering the COP commitment, climate change ambitions and government push for RE, the chances of drastic changes in regulatory regime are less likely. This can also be ascertained from the fact that as against capacity addition of ~142 GW of RE, only ~19 GW of conventional capacity has been added over the last ~ 6 years (Fiscal 2020 to Fiscal 2026).
- The signing of PSAs with higher tariffs was delayed by Discoms because tariffs were reduced in subsequent tenders. Government offtakers in the state of Andhra Pradesh, India filed a petition before the State Regulator, Andhra Pradesh Electricity Regulation Commission (APERC), seeking a recalculation of tariffs payable by them under various PPAs with wind developers in the past. However, the matter concluded in favour of RE developers. With the government's plan for stricter adherence to RPOs, higher penalty in case of non-compliance, and revision of tariff in manufacturing-linked tenders, PSA signing activity improved during Fiscal 2022 onwards.
- In November 2025, the MNRE indicated that LOAs with minimal or no likelihood of execution of PSAs may be considered for cancellation on a case-to-case basis. However, no REIA has taken any action to cancel such LoAs so far. Further, MNRE in May 2026 issued an office memorandum proposing a one-time relief package for nearly 44.8 GW of awarded renewable energy capacity. The relief package included transmission waivers, storage support, state grid flexibility and RPO/RCO compliance subject to eligibility conditions.
- There are only a few states which are complying with the RPO obligations fully and there has been limited enforcement on obligated entities - discoms and open access and captive power users - to meet RPO targets. The proposed amendment to the Electricity Act 2003 has stipulated a penalty on RPO non-compliance and uniform imposition of penalties and strict enforcement would be critical for significant improvement and fair distribution of RPO compliance across states.
- The solar power industry is currently facing cost pressures on account of volatility in module prices, exchange rates, freight, and commodity prices. This may impact on the EPC margin of RE developers as it may not be able to pass on the cost increase to SPVs.
- The RE sector, including the solar EPC, is highly competitive, with numerous players vying for market share. There is competition from global and regional solar EPC providers. Established competitors along with capable new entrants can pose challenges.
- The solar EPC industry is also highly fragmented and has been tending towards increased consolidation in recent years.
- Renewable projects development relies on a large pool of suppliers whose availability and quality vary across different regions, unlike more mature industries such as the automotive sector. There is a long tail of low-cost suppliers. However, these low-cost suppliers can impede the successful execution of projects and operations due to issues with quality and delivery delays.
- The RE industry is also characterized by a significant bid to procurement lag which is the time gap between winning a competitive bid with a fixed tariff and the actual physical procurement of modules/WTGs which often spans approximately 12 to 18 months, which exposes developers to volatility in component prices, changes in exchange rate, unpredictable movement in commodity cost such as for silicon, silver, aluminum, or steel, which may adversely and materially affect RE business, cash flows, results of operations and financial condition.

- Further, economic downturns and financial instability can reduce available capital and increase costs for renewable energy investments, affecting expansion plans of Developers.

4.2 Challenges

- There is counterparty credit risk due to the depleted financial position of most Discoms. Due to legacy issues, higher T&D losses, lack of adequate tariff revisions, lack of timely subsidy support, operational challenges, financial position in most of the State Discoms is weak. However, with competitive tariffs, payment security mechanism, diversification in counterparties largely mitigates the counterparty credit risk. Moreover, with the entry of REIA like SECI, this counterparty risk has largely been absorbed by the REIA.
- There may be delays in collecting receivables from off takers. Although the central and state governments in India have taken steps to improve the financial health and operational efficiency of state-owned Discoms across the country, there can be no assurance that off-takers will pay tariffs on time or at all as stipulated in the PPAs. Payment security mechanisms such as requirements for letters of credits, default escrow arrangements, payment security funds, or state government guarantees, may not be invoked promptly, enforced effectively, or fully cover shortfalls, and failure or delay in realizing payments through these mechanisms could adversely impact liquidity, increase financing costs, and materially affect RE business, cash flows, results of operations and financial condition. Persistent financial weakness of DISCOMS due to high transmission and distribution losses, inadequate tariff revisions, and operational inefficiencies may lead to prolonged payment delays or defaults.
- Power generation from RE projects is highly dependent on weather conditions and the profitability of operations depends not only on observed weather conditions at the project site, but also on the consistency of those weather conditions. As a result, the seasonal nature of our energy production can also place additional demands on working capital reserves and borrowing capacity under existing debt, particularly during periods when the cash flow from operations is reduced.
- In India, only a limited number of IPP players possess significant wind capabilities, which is an essential requirement for Complex Projects, Execution risk in under construction projects may impact profitability and in turn liquidity. During monsoon/rainy season, EPC players may not be able to execute projects due to site accessibility, waterlogging etc. which can affect their revenue during these periods. However, in-house EPC expertise and experience in execution of large-scale projects should mitigate this risk.
- Furthermore, the availability of contiguous land and acquisition challenges associated with land parcels are some of the key challenges that developers are facing. To acquire large tracts of land in a single resourceful location, many stakeholders have to be involved, which slows down the pace of project execution. Identification of suitable land parcels with adequate solar or wind resource potential, proximity to transmission infrastructure, and minimal environmental or social constraints can be time-consuming and complex. Projects may face delays due to fragmented land ownership, title disputes, conversion of land use classifications, local opposition, or prolonged negotiations with landowners. In certain regions, competing land uses priorities for agriculture, infrastructure, or industrial development further constrain availability of suitable sites. There are frequent changes in State policies for land use. For example, the premium for allotment of revenue land in Rajasthan has increased significantly, having doubled in 2025 as compared to 2024. The 40 GW solar park scheme, which provides land for successful bidders for setting up the projects, is facilitative in this regard.
- Supply chain disruptions, including dependence on imported modules, cells, inverters, and balance-of-plant equipment, expose projects to risks related to price volatility, logistics delays, trade restrictions, and foreign exchange fluctuations. Policy interventions such as changes in

customs duties, approved list requirements, or domestic content mandates may also impact procurement timelines and capital costs.

- After introduction of ALMM versions in India and various duties on solar components, developers procure solar modules from domestic manufacturers. However, raw materials comprising of ingot, polysilicon and wafers which form the backbone of solar modules are still majorly imported from Chinese manufacturers. Similarly, while Indian manufacturing capacity for WTGs has been established through OEMs, the supply chain for critical sub-components remains heavily skewed towards China. Specifically, the permanent magnets required for modern turbines rely on rare earth elements for which China controls over 80% of the global processing capacity. Consequently, even when Developers contract with Indian or European OEMs, a disruption in the Chinese rare earth supply chain can bottleneck the production of generators, leading to delays in turbine delivery schedules.
- In addition, Complex projects increase reliance on lithium iron phosphate (LFP) cell technology for integrating BESS. Currently, there is limited non-Chinese manufacturers for the technology with respect to scale and price point required for utility projects. Additionally, domestic industrial and commercial and EPC providers are not on par with international providers globally.
- Availability of timely transmission connectivity is another challenge. To optimize costs, utilization levels, and losses associated with the transmission system, it is crucial to have robust transmission planning. Concerns about connectivity for renewable projects have been raised by the various stakeholders at the appropriate levels. Nodal agencies (CTUIL and SECI) have planned various schemes to reduce grid congestion and enhance connectivity, taking this into account. Green Energy Corridor Scheme and Renewable Energy Zones are expected to add ~80 GW of transmission grid capacity taking it to more than 100 GW for RE projects. This will give comfort against the planned capacity additions in renewable energy segment.

4.3 Other key parameters affecting RE sector

The renewable energy sector in India is subject to multiple internal and external factors that may influence the operational performance, financial position, and long-term sustainability of renewable energy projects as they are dynamic in nature and may evolve due to changes in market conditions, regulatory frameworks, technological developments, and macroeconomic variables.

Parameter	Detailed analysis
Variability in module prices and component prices	Renewable energy projects, such as solar and wind power, require significant upfront expenditure on equipment and components, with solar modules accounting for 50-60% of the total capital cost. The cost of these components is influenced by global supply-demand conditions, raw material availability, and logistics costs. Fluctuations in upstream component prices, such as polysilicon, can impact the profitability of solar energy projects. Recent withdrawal of export benefits and subsidies to manufacturers by the Chinese government, such as the export tax removal on BESS and solar cells in January 2026, may increase procurement costs
Inadequate grid infrastructure and underutilised capacity	Large-scale solar plants often lack nearby transmission infrastructure, making robust transmission planning crucial to transmit power to load centers. However, India's transmission network has not kept pace with renewable energy capacity additions, hindering the country's renewable energy ambitions. Time delay in development/augmentation of grid infrastructure is leading to renewable energy curtailment, particularly in states like Gujarat and Rajasthan.

Parameter	Detailed analysis
Discom credit risk and payment delays	The financial health of Indian Discoms is a key risk factor for the renewable energy sector, exposing RE developers to counterparty credit risk and payment delays. To mitigate this risk, developers can diversify their portfolios and strengthen PPAs with provisions like letters of credit and interest on delayed payments. Dealing with central agencies like SECI, NTPC, and NVVN poses lower risk of payment delays and defaults.
Tariff compression	Renewable energy tariffs in India have decreased over the past 5-7 years due to increased competition, technology cost reductions, and policy-driven procurement. While lower tariffs promote affordability, continued tariff compression poses risks to project developers and investors by reducing revenue headroom and limiting their ability to absorb cost shocks. This may adversely affect the financial resilience of renewable energy projects.
Financing and interest rate risks	RE projects are capital-intensive and rely on long-term debt and equity financing, making them vulnerable to financing and interest rate risks. Changes in macroeconomic conditions, monetary policy, or credit market dynamics can increase borrowing costs, reduce debt availability, and impact project viability. Interest rate movements can directly affect debt servicing obligations and project economics, particularly for projects with fixed tariffs.
Weather and climate related risks	RE projects are exposed to weather variability and climate-related risks, which can impact generation levels, operational performance, and revenue stability. Extreme weather events can cause physical damage, disrupt operations, and increase maintenance costs. Climate change may further increase the frequency and intensity of adverse weather events, affecting resource availability and equipment performance.
Technology risk due to uncertainty around long-term performance	The RE sector is rapidly evolving with new technologies emerging, but their long-term performance and reliability are not fully established, posing risks to project returns. Technological advancements can also lead to obsolescence risk, making existing assets less competitive and affecting revenue potential. Additionally, equipment degradation can reduce power generation and impact project profitability.
Financing and Banking structure of India	The growth of RE projects in India is influenced by the domestic banking system's structure, which relies on short-term liabilities and may limit long-term debt availability. This can constrain financing for capital-intensive RE projects, which require long-term funding aligned with asset lifecycles. Regulatory changes and shifts in monetary policy can also impact access to financing.
Competitive pressure	The Indian RE sector is experiencing increased competition, leading to aggressive bidding and downward pressure on tariffs and margins. This heightened competition may increase execution and financial risks for projects, potentially driving consolidation in the sector. Larger, well-capitalized entities may be favored in this environment.

5 Competitive assessment

5.1 About Sembcorp Green Infra Ltd.

Sembcorp Green Infra Ltd. ("*SGIL"* or "*the Company"*) SGIL is recognized as one of India's foremost renewable energy companies, dedicated to advancing the country's clean energy transition. It delivers reliable, sustainable, and innovative renewable power solutions. SGIL is a wholly owned subsidiary of Sembcorp Industries, a Singapore-headquartered global energy and urban solutions provider.

SGIL is an independent power producer (IPP) engaged in developing, operating, and maintaining utility-scale renewable energy projects in India and is one of the early entrants in single technology wind projects and Complex project tenders in India. SGIL has been active in the Indian RE market since 2005 and is currently among the top 10 largest renewable IPPs in the country by total operational capacity as of March 31, 2026, with an aggregate renewable portfolio of ~7.64 GW/GWh, comprising ~3.60 GW of operational capacity and ~4.04 GW/GWh under various stages of development. SGIL has the largest operational capacity at the time of filing of its Draft Red Herring Prospectus (DRHP) among its domestically listed peers at the time of their respective DRHP/RHP filings. As of March 31, 2026, SGIL is among the top five wind operators among IPPs by operational capacity, among the top ten solar operations among IPPs by operational capacity and among the top ten largest renewable IPPs in India by operational capacity, having grown in market share by operational capacity since last 5 years. This scale places the company within a competitive bracket among large diversified renewable platforms in India, enabling it to participate across utility-scale solar, wind, hybrid, RTC, and storage-linked tenders. In particular, SGIL is actively developing and scaling Complex Projects, which have the ability to command premium tariffs and attractive risk-adjusted returns. The Company was the fastest developer of the first three wind projects with the Solar Energy Corporation of India (SECI). It has significant capabilities in wind projects, bolstered by its operating history in wind projects of over 20 years. It is among the top 5 wind operators among IPPs by operational capacity as of March 31, 2026.

SGIL benefits from strong parentage under Sembcorp Industries Ltd., a Temasek Portfolio Company, providing the company with strategic advantages such as access to capital, refinancing flexibility, and relatively lower cost of debt compared to standalone developers. The Sembcorp Group operates a global platform across 12 countries, with an energy portfolio of 35.2 GW/GWh in gross capacity and a renewable energy portfolio of 21.9 GW/GWh in gross capacity which includes 8.3 GW of wind, 9.3 GW of solar, 4.3 GWh in energy storage systems[2] and 49 MW of hydro as of June 30, 2026. This relationship also enables SGIL to leverage international expertise while executing projects tailored to India's needs. The company has a pipeline of ~ 4.04 GW of projects under construction, primarily located in resource-rich states such as Rajasthan and Karnataka, spanning single-technology projects,

[2] Across Singapore, Australia, China, India, Indonesia, the UK, and Vietnam

hybrid projects, and hybrid projects integrated with BESS. SGIL is supported in BESS by Sembcorp Group, which is one of Asia's largest battery operators and one of the early adopters of BESS in Asia. SGIL operational portfolio is largely contracted under long-term PPAs with a weighted average residual tenure of over 16.07 years, with around 43.22% of operational capacity contracted with central counterparties such as SECI and NTPC, offering relatively stronger payment security. SGIL's portfolio comprises of 105 projects (of which 84 are operational projects) is geographically diversified across 13 states and union territories in India, with a high concentration in the resource-rich states of Rajasthan, Karnataka and Gujarat and includes wind, solar, hybrid, and storage assets, supported by strong tariff competitiveness in wind and hybrid auctions.

SGIL's procurement philosophy is rooted in the continuous pursuit of technological adoption and adaptation. The Company focuses on identifying and adopting breakthrough technologies before they become market standards. For instance, it has adopted and led the way in installing high-rated wind turbines, Sembcorp was the first to place a commercial order 4MW WTGs in India, setting industry benchmarks and establishing itself as the early adopters in the industry. Similarly, it has consistently monitored industry led technological advancements and positioned itself among the early adopters of advanced N-Type TOPCon (Sembcorp's 1st order of N-type Topcon was in 2023) and Bifacial modules for its solar under construction projects at the auction stage, as well as higher watt peak modules (625Wp modules were ordered in 2023 period), HDG structures, tracker systems, and central inverters, all of which enhance generation gains and reduce degradation rates.

The operational track record, self-O&M capabilities for wind and solar assets, and portfolio diversification partially offset the risk of sensitivity to weather variability relative to smaller or less diversified operators. In-house EPC and O&M capabilities provide greater accountability, efficiency, and performance by ensuring one entity manages all project stages. This leads to better coordination, faster issue resolution, effective risk mitigation, and cost optimization through improved system performance. As of March 31, 2026, 1.21 GW, or 57.93% of operational capacity of SGIL in single technology wind projects, and 1.41 GW, or 99.43%, of its operational capacity in single technology solar projects, was operated in-house, with the remainder overseen by third-party O&M service providers. Among IPPs in India, the Company has one of the largest in-house operated wind portfolio. It is also among the leading in-house operated solar portfolio by Operational Capacity as at March 31, 2026. The in-house O&M capabilities have enabled SGIL wind projects in Gujarat and Tamil Nadu to be among the most generative projects, with higher electricity generation per unit capacity in Fiscals 2026 and 2025.

As of March 31, 2026, the Company has sufficient connectivity available for its projects under construction and has a bank of 0.95 GW of additional connectivity for future growth and the Company has completed approximately 54% of its land acquisition for projects with signed PPAs. In Fiscal 2026, SGIL secured 6,008.11 acres of land as compared to 1,865.43 acres in Fiscal 2025. This represents an acquisition rate that is already 3.22 times faster than Fiscal 2025.

During Fiscal 2026, Fiscal 2025 and Fiscal 2024, profit margins for the year for SGIL were 13.12%, 12.20% and 14.96% respectively, and EBITDA as a percentage of average adjusted capital employed of SGIL was 12.48%, 12.45% and 13.22% respectively, which was comparable with the industry. As at March 31, 2026, the amounts earmarked toward debt service reserves by the Company comprised 0.13% of long-term loans outstanding, which is lower than the industry average of 2.6% to 3.4%.

5.2 Competitive mapping of renewable energy independent power producers in India

Competitive mapping covers the details of companies, their products and services within a given market to understand competitive intensity. Some of the key players include Adani Green Energy Limited, ReNew Energy Global PLC, ACME Solar Holdings Limited, NTPC Green Energy Limited and Tata Power Renewable Energy Limited. These players also have a sizeable quantum of capacity under construction/development. The RE IPPs face significant competition in the RE industry. The primary competitors include local and international companies which are developers and operators of RE projects. The RE IPPs also compete with traditional energy companies such as Utility companies generating power from conventional fossil fuels.

Table 10: Operational and under construction/development RE capacity of key players (As of March 2026)

Particulars	Sembcorp Green Infra Ltd.	ReNew Energy	Adani Green Energy	ACME Solar	NTPC Green Energy	Tata Power RE	Avaada Green Energy	JSW Neo Energy	Greenko Group	Cleanmax Enviro	SAEL Energy
Operational Capacity (GW)	3.60	12.81	19.29	2.99	10.08	6.53	7.20	6.17	7.45	3.64	NA
Under Construction/ Development capacity (GW/GWh)@	4.04	7.43	NA	6.29	19.89	5.11	10.50	26.41	NA	2.81	NA
Total (GW/GWh)	**7.64**	**20.24**	**19.29^**	**9.28**	**29.97**	**11.64**	**17.70***	**32.58**	**7.45^**	**6.46**	**8.30**
Pipeline to installed capacity ratio	1.12	0.58	NA	2.10	1.97	0.78	1.46	4.28	NA	0.77	NA
Operational capacity at the time of DRHP/RHP of respective Company&	3.60	N/A	1.96$	1.34	3.32	N/A	N/A	N/A	N/A	2.80	0.87
Pipeline to installed capacity ratio at the time of DRHP/RHP	1.12	N/A	0.61	3.72	4.09	N/A	N/A	N/A	N/A	1.89	5.62

*@Including BESS capacity, ^ Only operational capacity available, *DC Capacity, & from DRHP and RHP filed to Regulator; $ as per annual report for Fiscal 2018, N/A: Not applicable as not yet listed on Indian Stock Markets*

Source: Industry, Company websites, Investor Presentations submitted to SEBI, Crisil Intelligence

Table 11: Key operational and financial parameters of select listed players

a) Fiscal 2026

Particulars (Fiscal 2026)	Sembcorp Green Infra Limited	ReNew Energy Group PLC	Adani Green Energy Limited	ACME Solar Holdings Limited	NTPC Green Energy Limited	Clean Max Enviro Energy Solutions Limited
Operational capacity (MWac/MWh)	**3,596.86**	**12,811.80**	**19,294.00**	**2,990.00**	**10,076.00**	**3,643.94**
Single Technology Wind Projects (MWac)	2,088.55	4,411.00	2,563.00	150.00	767.00	787.58
Single Technology Solar Projects (MWac)	1,419.91	6,136.00	13,515.00	2,840.00	9,309.00	2856.36
Single Technology BESS Projects (MWh)	NA	NA	NA	NA	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac)	88.40	NA	3,216.00	NA	NA	NA
Complex Projects - FDRE Projects (MWac/MWh)	NA	2,264.80	NA	NA	NA	NA
Under Construction Capacity (MWac/MWh)	**4,039.70**	**7,431.80**	**NA**	**6,285.00**	**19,895.00**	**2,812.05**
Single Technology Wind Projects (MWac)	160.70	283.80	NA	-	6,228.00	1,181.70
Single Technology Solar Projects (MWac)	300.00	1,575.00	NA	300.00	13,667.00	1,630.35
Single Technology BESS Projects (MWh)	-	NA	NA	1,204.00	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac)	1,610.00	NA	NA	750.00	NA	NA
Complex Projects - FDRE Projects (MWac/MWh)	1,969.00	5,573.00	NA	4,031.00	NA	NA
Under Construction Contracted Capacity (MWac/MWh)	**1,784.70**	**7,431.80**	**NA**	**4,484.00**	**16,469.00**	**2,812.05**
Single Technology Wind Projects (MWac)	160.70	283.80	NA	-	6,228.00	1,181.70
Single Technology Solar Projects (MWac)	300.00	1,575.00	NA	-	10,241.00	1,630.35
Single Technology BESS Projects (MWh)	-	NA	NA	1,204.00	NA	NA
Complex Projects - Wind Solar Hybrid Projects (MWac)	562.00	NA	NA	300.00	-	NA
Complex Projects - FDRE Projects (MWac/MWh)	762.00	5,573.00	NA	2,980.00	-	NA
Under Construction Awarded Capacity (MWac/MWh)	**2,255.00**	**-**	**NA**	**1,801.00**	**3,426.00**	**NA**
Single Technology Wind Projects (MWac)	-	NA	NA	-		NA
Single Technology Solar Projects (MWac)	-	NA	NA	300.00	3,426.00	NA

Particulars (Fiscal 2026)	Sembcorp Green Infra Limited	ReNew Energy Group PLC	Adani Green Energy Limited	ACME Solar Holdings Limited	NTPC Green Energy Limited	Clean Max Enviro Energy Solutions Limited
Single Technology BESS Projects (MWh)	-	NA	NA	NA	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac)	1,048.00	NA	NA	450.00	NA	NA
Complex Projects - FDRE Projects (MWac/MWh)	1,207.00	NA	NA	1,051.00	NA	NA
Plant Level PLF (%) - Overall	23.69%	NA	NA	25.90%	22.48%	NA
Plant Level PLF (%) - Single Technology Wind Projects	25.42%	27.00%	26.60%	NA	22.29%	35.10%
Plant Level PLF (%) - Single Technology Solar Projects	20.38%	22.00%	24.00%	NA	24.40%	NA
Plant Level PLF (%) - Complex Projects	26.55%	NA	35.20%	NA	NA	45.18%
Plant Availability % - Overall	95.96%	**NA**	**NA**	**99.50%**	**NA**	**98.19%**
Plant Availability % - Single Technology Wind Projects	95.05%	NA	95.60%	NA	NA	NA
Plant Availability % - Single Technology Solar Projects	98.47%	NA	99.20%	NA	NA	NA
Plant Availability % - Complex Projects	97.98%	NA	98.50%	NA	NA	NA
Grid Availability % - Overall	**98.62%**	**NA**	**NA**	**99.20%**	**NA**	**99.24%**
Revenue from operations	26,524.95	134,305.00	129,280.00	20,233.79	28,584.20	19,128.73
Total income	28,284.25	150,635.00	138,190.00	25,070.80	30,351.20	20,752.14
EBITDA	20,987.26	102,489.00	116,590.00	22,650.37	26,517.60	12,945.63
EBITDA Margin %	74.20%	68.04%	84.37%	90.35%	87.37%	62.38%
Profit for the year (PAT)	3,710.83	10,385.00	19,870.00	4,978.85	5,213.50	855.77
Net Debt to Equity	1.52	4.76	3.14	2.48	1.49	1.75
Net Debt to EBITDA	5.51	6.70	8.05	5.55	10.80	7.48
EBITDA as a percentage of Average Adjusted Capital Employed	12.48%	14.29%	12.11%	15.55%	8.57%	14.37%
Days of Receivables Outstanding	29	47	40	NA	46	20
Interest coverage	2.58	1.66	1.80	2.02	2.99	1.65
Cash profit for the year	12,206.82	37,223.00	59,700.00	NA	17,846.10	3,319.41

Particulars (Fiscal 2026)	Sembcorp Green Infra Limited	ReNew Energy Group PLC	Adani Green Energy Limited	ACME Solar Holdings Limited	NTPC Green Energy Limited	Clean Max Enviro Energy Solutions Limited
Weighted average interest rate	7.75%	~9.0%	NA	8.40%	NA	8.50%
Gross Block to EBITDA	10.34	8.13	9.83	NA	16.46	10.05
Gross Block to Operating EBITDA	11.28	9.67	10.65	NA	17.63	11.49

b) Fiscal 2025

Particulars (Fiscal 2025)	Sembcorp Green Infra Limited	ReNew Energy Group PLC	Adani Green Energy Limited	ACME Solar Holdings Limited	NTPC Green Energy Limited	Clean Max Enviro Energy Solutions Limited
Operational capacity (MWac/MWh)	**2,930.56**	**11,167.20**	**14,243.00**	**2,705.00**	**5,902.00**	**2,177.99**
Single Technology Wind Projects (MWac)	2,057.35	4,081.30	2,000.00	NA	483.00	557.98
Single Technology Solar Projects (MWac)	784.81	5,271.10	10,103.00	2,705.00	5,419.00	1,620.01
Single Technology BESS Projects (MWh)	-	NA	NA	NA	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac)	88.40	NA	2,140.00	NA	NA	NA
Complex Projects - FDRE Projects (MWac/MWh)	-	1,814.80	NA	NA	NA	NA
Under Construction Capacity (MWac/MWh)	**2,885.05**	**7,287.60**	**-**	**4,265.00**	**17,277.00**	**2,769.66**
Single Technology Wind Projects (MWac)	189.95	613.80	NA	150.00	3,752.00	812.40
Single Technology Solar Projects (MWac)	635.10	2,364.80	NA	735.00	13,525.00	1,957.26
Single Technology BESS Projects (MWh)	-	NA	NA	NA	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac)	1,610.00	4,309.00	NA	750.00	NA	NA
Complex Projects - FDRE Projects (MWac/MWh)	450.00	NA	NA	2,630.00	NA	NA
Under Construction Contracted Capacity (MWac/MWh)	**1,387.05**	**-**	**-**	**2,175.00**	**-**	**-**
Single Technology Wind Projects (MWac)	189.95	NA	NA	150.00	NA	NA
Single Technology Solar Projects (MWac)	635.10	NA	NA	135.00	NA	NA
Single Technology BESS Projects (MWh)	-	NA	NA	NA	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac/MWh)	562.00	NA	NA	300.00	NA	NA
Complex Projects - FDRE Projects (MWac/MWh)	-	NA	NA	1,590.00	NA	NA

Particulars (Fiscal 2025)	Sembcorp Green Infra Limited	ReNew Energy Group PLC	Adani Green Energy Limited	ACME Solar Holdings Limited	NTPC Green Energy Limited	Clean Max Enviro Energy Solutions Limited
Under Construction Awarded Capacity (MWac/MWh)	**1,498.00**	**-**	**-**	**2,090.00**	**-**	**-**
Single Technology Wind Projects (MWac)	-	NA	NA	NA	NA	NA
Single Technology Solar Projects (MWac)	-	NA	NA	600.00	NA	NA
Single Technology BESS Projects (MWh)	-	NA	NA	NA	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac)	1,048.00	NA	NA	450.00	NA	NA
Complex Projects - FDRE Projects (MWac/MWh)	450.00	NA	NA	1,040.00	NA	NA
Plant Level PLF (%) - Overall	**23.15%**	**NA**	**NA**	**25.60%**	**24.07%**	**NA**
Plant Level PLF (%) - Single Technology Wind Projects	24.14%	24.40%	27.20%	NA	21.01%	31.60%
Plant Level PLF (%) - Single Technology Solar Projects	20.76%	25.00%	24.80%	25.60%	24.17%	NA
Plant Level PLF (%) - Complex Projects	18.05%	NA	39.50%	NA	NA	45.90%
Plant Availability % - Overall	**96.61%**	**NA**	**NA**	**99.50%**	**NA**	**98.17%**
Plant Availability % - Single Technology Wind Projects	95.78%	NA	95.90%	NA	NA	NA
Plant Availability % - Single Technology Solar Projects	99.26%	NA	99.50%	99.50%	NA	NA
Plant Availability % - Complex Projects	97.49%	NA	99.60%	NA	NA	NA
Grid Availability % - Overall	**99.26%**	**NA**	**NA**	**99.80%**	**NA**	**99.10%**
Revenue from operations	23,182.87	97,520.00	112,120.00	14,051.31	22,096.40	14,957.01
Total income	24,498.79	109,070.00	124,220.00	15,752.41	24,657.00	16,103.42
EBITDA	18,371.15	83,078.00	100,870.00	14,055.40	21,727.90	10,150.72
EBITDA Margin %	74.99%	76.17%	81.20%	89.23%	88.12%	63.03%
Profit for the year (PAT)	2,988.29	4,591.00	20,010.00	2,508.21	4,741.20	194.29
Net Debt to Equity	1.68	4.88	3.23	1.65	0.78	1.97
Net Debt to EBITDA	5.75	7.70	7.23	5.30	6.65	6.23
EBITDA as a percentage of Average Adjusted Capital Employed	12.45%	13.46%	13.32%	13.39%	11.96%	14.26%

Particulars (Fiscal 2025)	Sembcorp Green Infra Limited	ReNew Energy Group PLC	Adani Green Energy Limited	ACME Solar Holdings Limited	NTPC Green Energy Limited	Clean Max Enviro Energy Solutions Limited
Days of Receivables Outstanding	38	65	28	52	47	13
Interest coverage	2.54	1.59	1.84	1.85	2.86	1.53
Cash profit for the year	10,667.51	27,782.00	51,670.00	6,312.49	14,090.31	3,464.55
Weighted average interest rate	8.03%	~9.12%	NA	NA	NA	9.19%
Gross Block to EBITDA	9.84	8.69	8.83	10.59	11.52	8.68
Gross Block to Operating EBITDA	10.60	10.09	10.03	12.05	13.06	9.78

c) Fiscal 2024

Particulars (Fiscal 2024)	Sembcorp Green Infra Limited	ReNew Energy Group PLC	Adani Green Energy Limited	ACME Solar Holdings Limited	NTPC Green Energy Limited	Clean Max Enviro Energy Solutions Limited
Operational capacity (MWac/MWh)	**2,685.06**	**9,171.00**	**10,934.00**	**1,340.00**	**2,925.00**	**1,755.21**
Single Technology Wind Projects (MWac)	1,992.85	4,071.00	1,401.00	NA	100.00	508.48
Single Technology Solar Projects (MWac)	620.11	4,159.00	7,393.00	1,340.00	2,825.00	1,246.73
Single Technology BESS Projects (MWh)	-	NA	NA	NA	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac)	72.10	NA	2,140.00	NA	NA	NA
Complex Projects - FDRE Projects (MWac/MWh)	-	941.00	NA	NA	NA	NA
Under Construction Capacity (MWac/MWh)	**2,030.30**	**6,121.90**	**11,019.00**	**4,030.00**	**11,571.00**	**435.80**
Single Technology Wind Projects (MWac)	239.80	1,003.90	1,010.00	150.00	2,000.00	36.30
Single Technology Solar Projects (MWac)	764.00	3,405.00	9,409.00	1,800.00	9,571.00	399.50
Single Technology BESS Projects (MWh)	-	NA	NA	NA	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac)	1,026.50	1,713.00	600.00	830.00	NA	NA
Complex Projects – FDRE Projects (MWac/MWh)	-	NA	NA	1,250.00	NA	NA
Under Construction Contracted Capacity (MWac/MWh)	**720.30**	**-**	**11,019.00**	**1,650.00**	**-**	**-**
Single Technology Wind Projects (MWac)	239.80	NA	1,010.00	150.00	NA	NA
Single Technology Solar Projects (MWac)	464.00	NA	9,409.00	1,500.00	NA	NA

Particulars (Fiscal 2024)	Sembcorp Green Infra Limited	ReNew Energy Group PLC	Adani Green Energy Limited	ACME Solar Holdings Limited	NTPC Green Energy Limited	Clean Max Enviro Energy Solutions Limited
Single Technology BESS Projects (MWh)	-	NA	NA	NA	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac)	16.50	NA	600.00	NA	NA	NA
Complex Projects - FDRE Projects (MWac/MWh)	-	NA	NA	NA	NA	NA
Under Construction Awarded Capacity (MWac/MWh)	**1,310.00**	**-**	**-**	**2,380.00**	**-**	**-**
Single Technology Wind Projects (MWac)	-	NA	NA	NA	NA	NA
Single Technology Solar Projects (MWac)	300.00	NA	NA	300.00	NA	NA
Single Technology BESS Projects (MWh)	-	NA	NA	NA	NA	NA
Complex Projects – Wind Solar Hybrid Projects (MWac)	1,010.00	NA	NA	830.00	NA	NA
Complex Projects - FDRE Projects (MWac/MWh)	-	NA	NA	1,250.00	NA	NA
Plant Level PLF (%) - Overall	**25.01%**	**NA**	**NA**	**24.59%**	**23.86%**	**NA**
Plant Level PLF (%) - Single Technology Wind Projects	26.44%	26.40%	29.40%	NA	19.78%	34.52%
Plant Level PLF (%) - Single Technology Solar Projects	21.51%	25.00%	24.50%	24.59%	23.97%	NA
Plant Level PLF (%) - Complex Projects	2.31%	NA	40.70%	NA	NA	39.18%
Plant Availability % - Overall	**97.14%**	**NA**	**NA**	**99.41%**	**NA**	**98.19%**
Plant Availability % - Single Technology Wind Projects	96.40%	NA	95.50%	NA	NA	NA
Plant Availability % - Single Technology Solar Projects	99.43%	NA	99.70%	99.40%	NA	NA
Plant Availability % - Complex Projects	NA	NA	99.50%	NA	NA	NA
Grid Availability % - Overall	**99.14%**	**NA**	**NA**	**99.40%**	**NA**	**99.26%**
Revenue from operations	22,491.77	83,399.00	92,200.00	13,192.50	19,626.00	13,898.37
Total income	24,018.16	96,531.00	105,210.00	14,662.67	20,376.60	14,253.09
EBITDA	18,227.47	73,386.00	86,190.00	12,361.65	18,190.30	7,415.73
EBITDA Margin %	75.89%	76.02%	81.92%	84.31%	89.27%	52.03%
Profit for the year (PAT)	3,593.58	4,147.00	12,600.00	6,977.81	3,428.60	(376.43)
Net Debt to Equity	1.52	4.64	3.05	2.61	1.98	2.17
Net Debt to EBITDA	4.85	7.70	6.18	5.46	6.78	6.54
EBITDA as a percentage of Average Adjusted Capital Employed	13.22%	13.90%	14.07%	15.44%	14.37%	16.64%

Particulars (Fiscal 2024)	Sembcorp Green Infra Limited	ReNew Energy Group PLC	Adani Green Energy Limited	ACME Solar Holdings Limited	NTPC Green Energy Limited	Clean Max Enviro Energy Solutions Limited
Days of Receivables Outstanding	56	68	27	85	100	37
Interest coverage	2.67	1.54	1.69	1.61	2.63	1.47
Cash profit for the year	10,680.99	27,311.00	42,970.00	4,166.89	11,293.42	2,083.28
Weighted average interest rate	7.93%	~9.15%	NA	NA	NA	9.46%
Gross Block to EBITDA	9.03	8.39	8.00	7.31	10.97	9.72
Gross Block to Operating EBITDA	9.85	10.22	9.42	8.29	11.44	10.20

**Including MW and MWh*

NA: Not available; Parameters to the extent reported by peers have been populated and/or calculated else classified as not available;

Source: Company websites, Annual Reports, Investors Presentations as available on stock exchanges, RHP Filings, Crisil Intelligence

Formulae used:

- ***Operational capacity (MW):*** *Aggregate megawatt/megawatt hour rated capacity of renewable power plants that are commissioned as per the commissioned certificate as at the reporting date.*
- ***Under Construction Capacity:*** *Aggregate megawatt/megawatt hour rated capacity of projects for which PPA or LOA has been signed but the project has not achieved its commercial operation.*
- ***Under Construction Contracted Capacity:*** *Aggregate megawatt/megawatt hour rated capacity of projects for which PPA has been signed but the project has not achieved its commercial operation. The contracted capacity for such projects is based on the terms specified in the PPA.*
- ***Under Construction Awarded Capacity:*** *Aggregate megawatt/megawatt hour rated capacity of projects for which LOA has been signed from the offtaker, but the corresponding PPA has not yet been executed, and the projects have not achieved their commercial operation. The contracted capacity for such projects is based on the terms specified in the LOA.*
- ***Plant Load Factor (%):*** *Plant Load Factor (PLF) is the ratio of quantum of energy the plant is able to generate compared to its maximum possible generation capacity during its operational time.*
- ***Plant Availability %:*** *Plant availability refers to the percentage of time that the power plant is capable of producing electricity as designed. It is a measure of the operational readiness of the plant's equipment and systems.*
- ***Grid Availability %:*** *Grid availability refers to the percentage of time that the electrical grid is available to accept and distribute the electricity generated by the power plant.*

- ***Revenue from operations:*** *Revenue from operations for the year.*
- ***Total income:*** *Total income is the sum of revenue from operations and other income for the year*
- ***EBITDA:*** *EBITDA is calculated as profit/(loss) for the year plus finance costs, total tax expenses, and depreciation and amortisation expenses for the year.*
- ***EBITDA Margin (%):*** *EBITDA Margin (%) is calculated as EBITDA divided by total income for the year.*
- ***Profit for the year (PAT):*** *Profit for the year (PAT) is (Loss)/Profit for the year*
- ***Net Debt to Equity:*** *Net Debt to Equity is calculated as net debt divided by total equity for the year. Net Debt is calculated as the sum of total borrowings (current and non-current), less (i) Cash and cash equivalents, (ii) Bank balances other than cash and cash equivalents, (iii) Bank deposits (non-current), (iv) Investments (current), (v) Interest accrued on bank deposits and (vi) Advance against mutual fund units (pending allotment). Total Equity includes Equity share capital, Other equity and Non-controlling interests.*
- ***Net Debt to EBITDA:*** *Net Debt to EBITDA is calculated as Net Debt divided by EBITDA for the year.*
- ***EBITDA as a percentage of Average Adjusted Capital Employed:*** *EBITDA as a percentage of Average Adjusted Capital Employed is EBITDA divided by Average Adjusted Capital Employed where Average Adjusted Capital Employed refers to the average of Adjusted Capital Employed as at the beginning and end of the relevant year. Further Adjusted Capital Employed is calculated as Total assets less (i) Total current liabilities (excluding current borrowings), (ii) Capital work-in-progress, (iii) Capital advances, (iv) Cash and cash equivalents, (v) Bank balances other than cash and cash equivalents, (vi) Bank deposits (non-current), (vii) Investments (current), (viii) Interest accrued on bank deposits and (ix) Advance against mutual fund units (pending allotment) for the year*
- ***Days of Receivables Outstanding:*** *Days of Receivables Outstanding is calculated as Trade Receivables less (i) unbilled receivables and (ii) unbilled to related parties receivables divided by Revenue from operations during the year plus (i) opening unbilled receivables less closing unbilled receivables, multiplied by days in the given year. Trade Receivables includes both current and non-current trade receivables.*
- ***Interest coverage:*** *Interest Coverage is calculated as EBITDA divided by finance costs for the year.*
- **Cash profit for the year** *: Cash profit for the* year *is calculated as Profit for the year plus (i) Depreciation and amortisation expenses, (ii) Unwinding of discounting on asset retirement obligation, (iii) Impairment loss/(reversal) on financial assets (net), (iv) Net unrealised (gain)/loss on foreign exchange fluctuations, (v) Net fair value changes of derivatives and mutual funds, (vi) Net Change in fair value of contingent consideration, (vii) Net loss on write-off of property, plant and equipment and fair valuation of assets classified as held for sale, (viii) Vendor advances, written off, and (ix) Deferred Tax less (i) Unwinding of interest income on trade receivables and security deposits, (ii) Liabilities no longer required written back.*
- ***Weighted average interest rate:*** *Weighted average interest rate has been calculated based on the borrowings outstanding as at the end of the financial year by applying the respective interest rates as at end of the financial year to such borrowings and weighting them according to their outstanding amounts at the end of the respective year.*
- ***Gross Block to EBITDA:*** *Gross block to EBITDA is calculated as gross block (including right-of-use (ROU) assets excluding capital work-in-progress (CWIP) divided by EBITDA for the year.*

- ***Gross Block to Operating EBITDA:*** *Gross block to operating EBITDA is calculated as gross block (including right-of-use (ROU) assets excluding capital work-in-progress (CWIP) divided by operating EBITDA for the year. Operating EBITDA is calculated as EBITDA minus Other income for the year.*

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