Industry Report on EPC in Power Transmission Infrastructure

Focus Industry: EPC in Power Transmission Infrastructure

February 2026

Prepared for

Om Power Transmission Limited

Disclaimer

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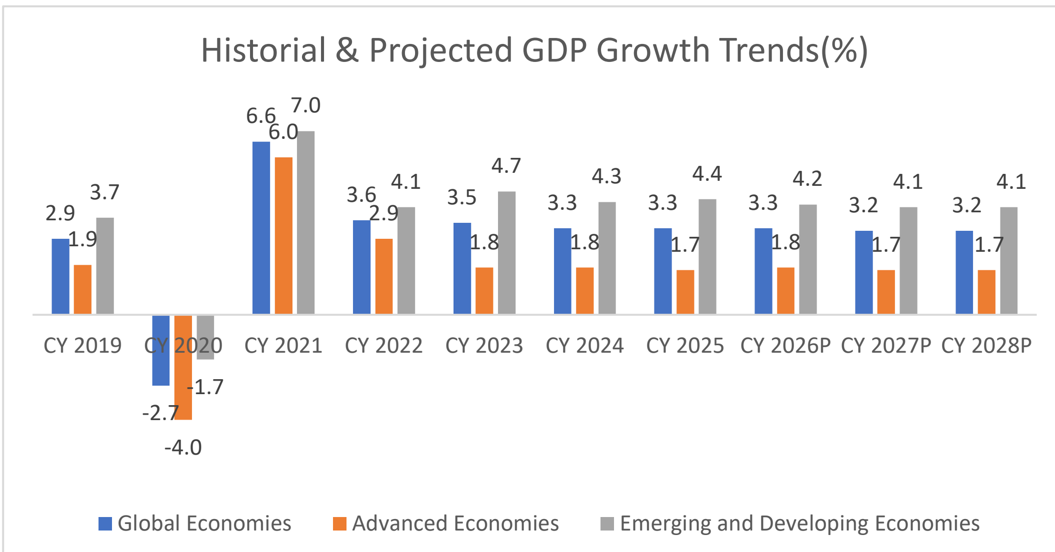
Global Economic Overview

Global growth is projected to remain resilient at 3.3 percent in 2026 and at 3.2 percent in 2027. The forecast marks a small upward revision for 2026 and no change for 2027 compared with that in the October 2025 World Economic Outlook (WEO). This steady performance on the surface results from the balancing of divergent forces. Headwinds from shifting trade policies are offset by tailwinds from surging investment related to technology, including artificial intelligence (AI), more so in North America and Asia than in other regions, as well as fiscal and monetary support, broadly accommodative financial conditions, and adaptability of the private sector



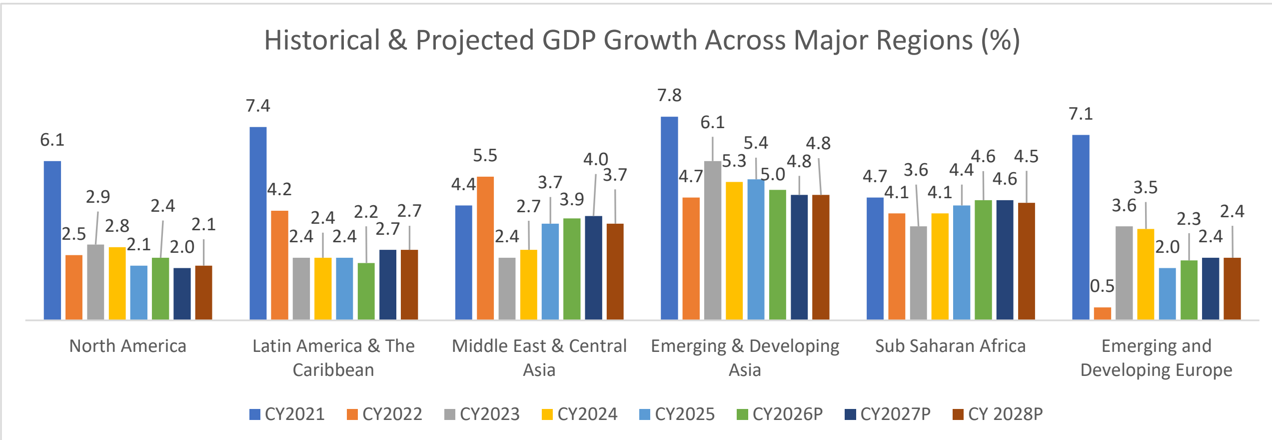
Source – IMF Global GDP Forecast Release January 2026

*Note CY 2028 projection is taken from October 2025(World Economic Outlook)

Note: Advanced Economies and Emerging & Developing Economies are as per the classification of the World Economic Outlook (WEO). This classification is not based on strict criteria, economic or otherwise, and it has evolved over time. It comprises of 40 countries under the Advanced Economies including the G7 (the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada) and selected countries from the Euro Zone (Germany, Italy, France etc.). The group of emerging market and developing economies (156) includes all those that are not classified as Advanced Economies (India, China, Brazil, Malaysia etc.)

Historical and Projected GDP Growth

GDP growth across major regions exhibited a mixed trend during 2024–25. While growth in several regions—including Emerging and Developing Asia as well as Latin America and the Caribbean—is expected to slow further in 2026, performance remains uneven across geographies. In Emerging and Developing Asia (comprising economies such as India, China, Indonesia, and Malaysia), GDP growth is projected to moderate to 5.4% in 2026, compared with 5.3% in the previous year. Similarly, in Latin America and the Caribbean, growth is expected to ease to 2.2% in 2026, before rebounding to 2.7% in 2027 as countries in the region approach potential output from differing cyclical positions.



Source-IMF World Economic Outlook January 2026 update.

*Note CY 2028 projection is taken from October 2025(World Economic Outlook)

By contrast, growth in the Middle East and Central Asia is projected to accelerate, rising from 3.7% in 2025 to 3.9% in 2026 and further to 4.0% in 2027. This acceleration is supported by higher oil output, resilient domestic demand, and ongoing structural reforms. Likewise, growth in Sub-Saharan Africa is expected to strengthen, rising from 4.4% in 2025 to 4.6% in both 2026 and 2027. However, according to the IMF World Economic Outlook, growth is projected to moderate slightly to 4.5% in 2028, driven by ongoing macroeconomic stabilization and reform efforts in several key economies. Meanwhile, in Emerging and Developing Europe, the sharp slowdown to 2.0% in 2025 is expected to reverse, with the region's economies projected to expand at an average rate of 2.3% in 2026 and 2.4% in both 2027 and 2028. Across most regions, this recovery also reflects the diminishing effects of recent shifts in global trade policies.

Global Economic Outlook

Since the October 2025 World Economic Outlook (WEO), trade tensions have continued to abate, although they remain subject to occasional flare-ups. A dispute between China and the United States involving controls on exports of semiconductors and rare earth minerals was followed by a truce that reduced bilateral tariffs until November 2026 and introduced a pause on export controls.

In addition, US authorities removed tariffs on some agricultural products for all countries, offsetting the higher tariffs on certain sectors that were previously announced and are now in effect. As a result, the overall US effective tariff rate remains broadly unchanged from the level assumed in the October 2025 WEO although changes for specific countries are significant. The US Supreme Court is widely expected to deliver a decision in early 2026 regarding the president's use of the International Emergency Economic Powers Act. At the same time, newly signed bilateral trade and other agreements, often including substantial investment and purchase commitments with limited public disclosure, have added further complexity. Although policy uncertainty has declined since October, it remains considerably higher than in January 2025.

Global growth in the third quarter of 2025 decelerated to 2.4 percent on an annualized basis, exceeding expectations; however, upside surprises in some countries were offset by downside surprises in others. In France, a boost from aerospace exports lifted growth to 2.2 percent, whereas in Germany, falling exports continued to weigh on activity, thereby leaving real GDP unchanged between the second and third quarters. Meanwhile, Japan's economy contracted by 2.3 percent, as private and government consumption partially offset the contraction driven by declines in private residential investment and exports. At the same time, China's growth decelerated to 2.4 percent (according to staff estimates), with weak domestic demand—particularly in the housing sector—only partly offset by resilient exports.

In contrast, growth in the United States accelerated to 4.3 percent, supported by a pickup in technology investment and expenditure, which is estimated to have added approximately 0.3 percentage point to average annualized GDP growth during the first three quarters of 2025, thereby offsetting the drag from the federal government shutdown in the final quarter of the year. In addition, there are indications that technology-related investment also contributed to economic activity in Spain and the United Kingdom, although the scale of this contribution was smaller than that observed in the United States.

India–European Union Free Trade Agreement:

India and the EU concluded a landmark Free Trade Agreement (FTA) on 27 January 2026 during the 16th India–EU Summit, which aims to deepen and stabilise trade between India—the world's fourth-largest economy—and the EU, the second-largest economic bloc. The agreement expands market access, reduces trade frictions, and enhances predictability for cross-border commerce, thereby building on an already strong economic relationship reflected in USD 136.54 billion of goods trade in FY25. It supports India's export-led growth by granting preferential access to over 99% of its exports and by integrating Indian industries more deeply into European value chains, while simultaneously providing the EU with a reliable long-term partner and a diversified supply base. Beyond tariff reductions, the FTA strengthens trade conditions by establishing clearer rules, streamlining procedures, and reinforcing compliance and dispute-resolution mechanisms. These measures collectively reduce administrative uncertainty, encourage long-term investment and sourcing decisions, and enable MSMEs and labour-intensive sectors to expand their presence in the EU's large and diverse market.

Against a backdrop of rising commercial engagement, the agreement delivers immediate gains for the EU by improving tariff treatment and clarifying market-entry conditions in India.

- India will eliminate or reduce tariffs on 96.6% of EU goods exports, potentially doubling EU exports to India and saving up to USD 4.79 billion annually in duties.
- Tariffs on cars will drop from 110% to 10%, with a quota of 250,000 vehicles per year, while most car-part tariffs will be phased out over 5–10 years.
- High Indian tariffs on machinery (up to 44%), chemicals (22%), and pharmaceuticals (11%) will largely be eliminated.
- Agri-food tariffs on selected EU priority products—such as confectionery, pastries, pasta, chocolates, and pet food—will be sharply reduced or eliminated over agreed timelines.
- Sheep meat (33%) and olive oil (up to 45%) tariffs will be phased down to zero after the staging period.
- Tariffs on alcoholic beverages will see major cuts: wine from 150% to 30%, spirits from up to 150% to 40%, and beer from 110% to 50%.

These reductions give EU exporters a strong competitive advantage by lowering some of India's highest tariff barriers and improving predictability for market entry. Lower duties across autos, industrial goods, and agri-food products expand market opportunities, strengthen EU price competitiveness, and support deeper distribution and after-sales networks in India. Indian consumers benefit through lower prices, better quality, and wider product choice, while Indian firms face increased competitive pressure—rewarding those that innovate and challenging those dependent on high tariff protection. Overall, the agreement positions the EU to scale exports and gain market share in sectors previously constrained by high border costs.

The U.S.–India Trade Deal:

The U.S.–India Trade Deal 2026 marks a major restructuring of bilateral economic relations by establishing an interim framework that resets tariffs, expands market access, and lays the groundwork for a full Bilateral Trade Agreement (BTA). Under this framework, the United States reduces effective tariffs on Indian goods from 50% to 18%, with plans to eventually eliminate duties on pharmaceuticals, gems and diamonds, and aircraft parts.

- Even after the deal, Section 232 tariffs on steel, aluminum, copper, and related products remain at 50%, while select auto components continue at 25%. At the same time, zero tariffs on certain pharmaceuticals, aircraft and parts, and some mechanical and electronic components continue.
- India, in turn, agrees to eliminate or reduce tariffs on all U.S. industrial goods and a wide range of agricultural products, including dried distillers' grains, sorghum for feed, tree nuts, fruits, soybean oil, wine, and spirits.

- In addition to tariff changes, the framework incorporates commitments on non-tariff barriers (NTBs) by simplifying certification, reducing procedural delays, and aligning standards in sectors such as medical devices and ICT goods, where regulatory friction has long affected trade.
- Both sides also pledge cooperation on digital trade rules, investment reviews, and supply-chain resilience, reflecting the broader strategic dimension of the agreement.
- India further commits to aggregate purchases of up to USD 500 billion in U.S. goods over five years—covering energy and technology products—partly contingent on significantly reducing imports of Russian crude.

Given India's strong presence in U.S. supply chains—with about 112,000 Indian suppliers out of 1.1 million foreign suppliers supporting U.S. businesses—the tariff rollback is expected to produce rapid economic effects across multiple sectors. Overall, the deal improves bilateral trade flows while deepening regulatory, technological, and strategic cooperation, enabling more predictable and resilient economic engagement.

Global Growth Projection

At broader level, the global growth is expected to remain steady, as momentum in high-tech sectors is projected to slow but continue to partly offset the drag elsewhere. While tariffs and elevated uncertainty are expected to weigh on the level of activity, their impact on growth is projected to fade during 2026,2027 and 2028. At 3.3 percent in 2026 and 3.2 percent in 2027 and 2028, global growth is therefore expected to decelerate slightly from the estimated 3.3 percent recorded in 2025. Compared with the October 2025 World Economic Outlook (WEO), the forecast for 2026 has been revised upward by 0.2 percentage point, whereas the forecast for 2027 remains unchanged. Nevertheless, there are significant revisions for some countries, with changes occurring in different directions.

Growth in advanced economies is projected at 1.8 percent in 2026 and 1.7 percent in 2027 and 2028. In the United States, economic activity is expected to expand by 2.4 percent in 2026, supported by fiscal policy and a lower policy rate, while the impact of higher trade barriers gradually wanes. This 0.3 percentage point upward revision relative to October reflects a stronger-than-expected GDP outturn in the third quarter of 2025, a rebound in activity in the first quarter of 2026 compared with the fourth quarter of 2025 following the end of the federal government shutdown, and the associated carryover effects. Looking ahead, growth in the United States is projected to remain solid at 2.0 percent in 2027, supported by a near-term fiscal boost from tax incentives for corporate investment under the One Big Beautiful Bill Act of 2025. Although technology-driven momentum is expected to moderate, it is still projected to provide a partial offset to lower immigration and moderating consumption.

In the euro area, growth is expected to remain steady at 1.3 percent in 2026 and to increase modestly to 1.4 percent in 2027. The slightly faster growth in 2027 reflects projected increases in public spending, particularly in Germany, alongside continued strong performance in Ireland and Spain. Overall, the forecast remains broadly unchanged from October, with the subdued growth outlook reflecting unresolved structural headwinds. The impact of the planned increase in defense spending is expected to materialize only in subsequent years, as commitments to reach target levels are phased in gradually through 2035. Compared with other regions, the euro area benefits less from the recent technology-driven investment boost. In addition, the lingering effects of persistently higher energy prices following Russia's invasion of Ukraine are expected to continue weighing on manufacturing, with additional pressure stemming from the real appreciation of the euro relative to the currencies of countries exporting similar products. In Japan, growth is projected to moderate from 1.1 percent in 2025 to 0.7 percent in 2026 and to 0.6 percent in 2027 and 2028. This marks a small upward revision relative to the October figure, reflecting in part the fiscal stimulus package announced by the new government.

In emerging market and developing economies, growth is projected to hover just above 4.0 percent in 2026, 2027, and 2028. Relative to the October forecast, China's growth in 2025 has been revised upward by 0.2 percentage point to 5.0 percent, reflecting the implementation of stimulus measures and additional policy bank lending for investment. Growth in China for 2026 has also been revised upward by 0.3 percentage point to 4.5 percent, as a result of lower effective US tariff rates on Chinese goods following the yearlong trade truce agreed in November, alongside stimulus measures assumed to be implemented over a two-year period. However, the economy's growth rate is expected to decelerate to 4.0 percent in 2027, as structural headwinds increasingly weigh on activity.

Key factors impacting Global Macroeconomic landscape

- Geopolitics remains a defining global risk factor. Ongoing conflict between Russia and Ukraine, heightened tensions in the Middle East, and increasing U.S. geopolitical actions involving countries such as Venezuela, Nigeria, and even regions like Greenland are amplifying systemic uncertainty. These developments are disrupting energy markets and reshaping global supply chains. At the same time, resource nationalism and strategic competition for rare earth minerals have moved from abstract concerns to day-to-day operations.
- The period of frictionless trade shaped by free trade agreements has given way to a stronger push toward regionalization and nearshoring. Geopolitical fragmentation and tariff uncertainty continue to challenge global trade flows.

- Technology adoption and sustainability have become core strategic priorities. Organizations are advancing digital transformation by embedding AI, automation, and cybersecurity into their operations to enhance productivity and safeguard critical assets. AI adoption is emerging as a visible driver of optimism, particularly within the information and communications sectors.

India Macroeconomic Analysis

The International Monetary Fund (IMF) has revised upward India's economic growth for 2025 by 0.7 percentage point to 7.3%. In its World Economic Outlook update, the IMF stated that the upward revision reflects strong growth momentum in the fourth quarter of the current fiscal year. At the same time, the IMF projects India's growth at 6.4 percent in the CY 2026, noting that despite the expected moderation, India is expected to remain a key driver of growth among emerging market and developing economies. In addition, the IMF expects inflation in India to return to near-target levels following a marked decline in 2025, driven by subdued food prices, which is expected to provide further support to domestic demand. However, the IMF cautioned that AI-driven productivity gains could lead to a pullback in investment and tighter global financial conditions, with spillover effects for emerging economies.

Country	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024	CY 2025	CY 2026 P	CY 2027 P	CY 2028 P
India[1]	–5.8%	9.7%	7.6%	9.2%	6.5%	7.3%	6.4%	6.4%	6.5%
China	2.3%	8.6%	3.1%	5.4%	5.0%	5.0%	4.5%	4.0%	4.0%
United States	-2.2%	6.1%	2.5%	2.9%	2.8%	2.1%	2.4%	2.0%	2.1%
Japan	-4.2%	2.7%	0.9%	1.4%	-0.2%	1.1%	0.7%	0.6%	0.6%
United Kingdom	-10.3%	8.6%	4.8%	0.4%	1.1%	1.4%	1.3%	1.5%	1.4%
Russia	-2.7%	5.9%	-1.4%	4.1%	4.3%	0.6%	0.8%	1.0%	1.1%
Germany	-4.1%	3.9%	1.8%	-0.9%	-0.5%	0.2%	1.1%	1.5%	1.2%

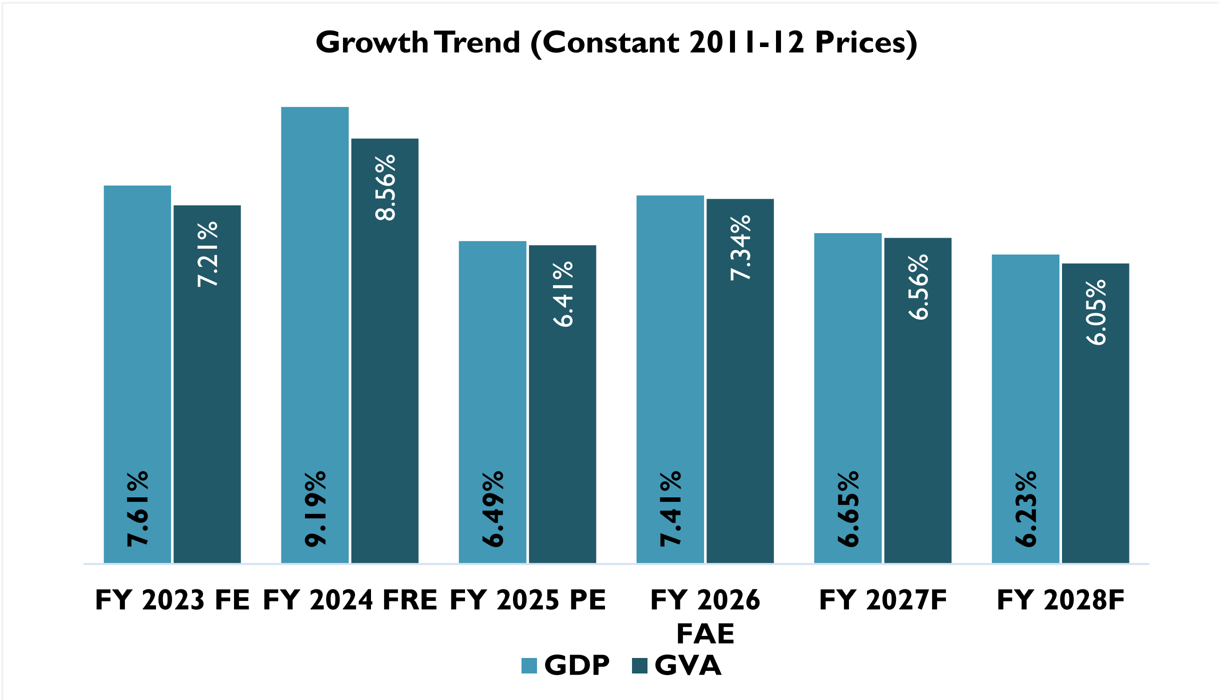
Source: World Economic Outlook, January 2026

*Note CY 2028 projection is taken from October 2025(World Economic Outlook)

Historical GDP and GVA Growth trend

As per the CMIE economics outlook, India's GDP at constant prices is estimated to grow to INR 2,28,74,197 crore in FY 2028 with the real GDP growth rates estimated to be 6.23% for FY 2028. Similarly, real Gross Value Added (GVA) growth stood is estimated to 6.0% in FY 2028. Even amidst global economic uncertainties, India's economy exhibited resilience supported by robust consumption and government spending.

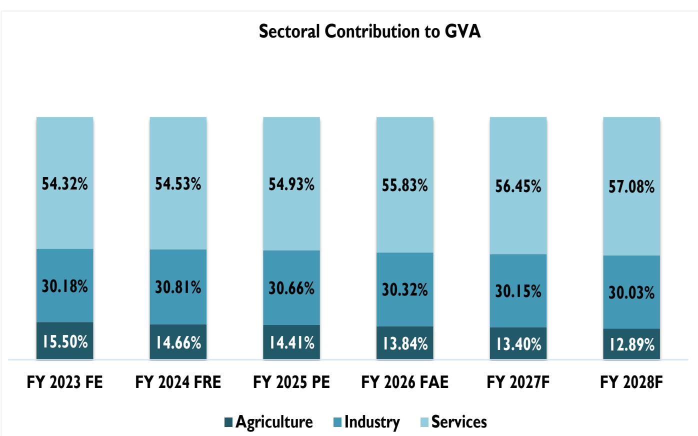
[1] For India, data and projections are presented on a fiscal year (FY) basis, with FY 2024/25 (starting in April 2024) shown in the 2024 column. India's growth projections are 6.4 percent for 2026, 6.4 percent for 2027 and 6.5% for 2028 based on calendar year

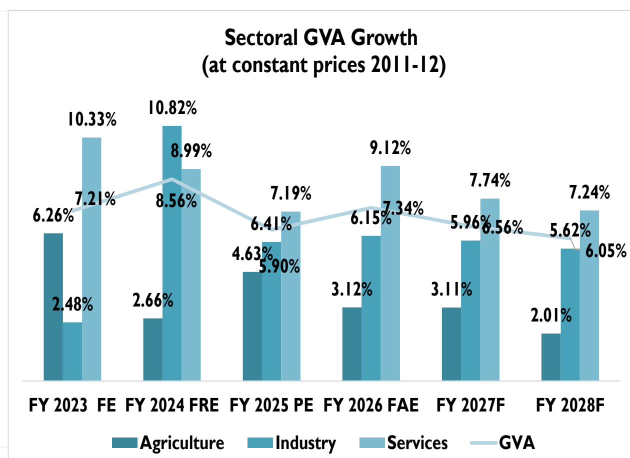


Source: Ministry of Statistics & Programme Implementation (MOSPI), National Account Statistics: FY2025, CMIE Economics Outlook

FE is Final Estimates, FRE is First Revised Estimate, PE is Provisional Estimates and FAE: First Advance Estimates, F: Forecasted

Sectoral Contribution to GVA and annual growth trend





Source: Ministry of Statistics & Programme Implementation (MOSPI), CMIE Economics Outlook

FE is Final Estimates, FRE is First Revised Estimate, PE is Provisional Estimates and FAE: First Advance Estimates, F: Forecasted

Sectoral analysis of GVA from FY 2025 to FY 2028 indicates a gradual normalization of growth across agriculture, industry, and services following the strong rebound in earlier years. In FY 2025, agriculture recorded a growth rate of 4.63%, which softened to 3.12% in FY 2026, and further moderated to 3.11% in FY 2027 and 2.01% in FY 2028. Correspondingly, the sector's contribution to GVA declined marginally from 14.41% in FY 2025 to 12.89%

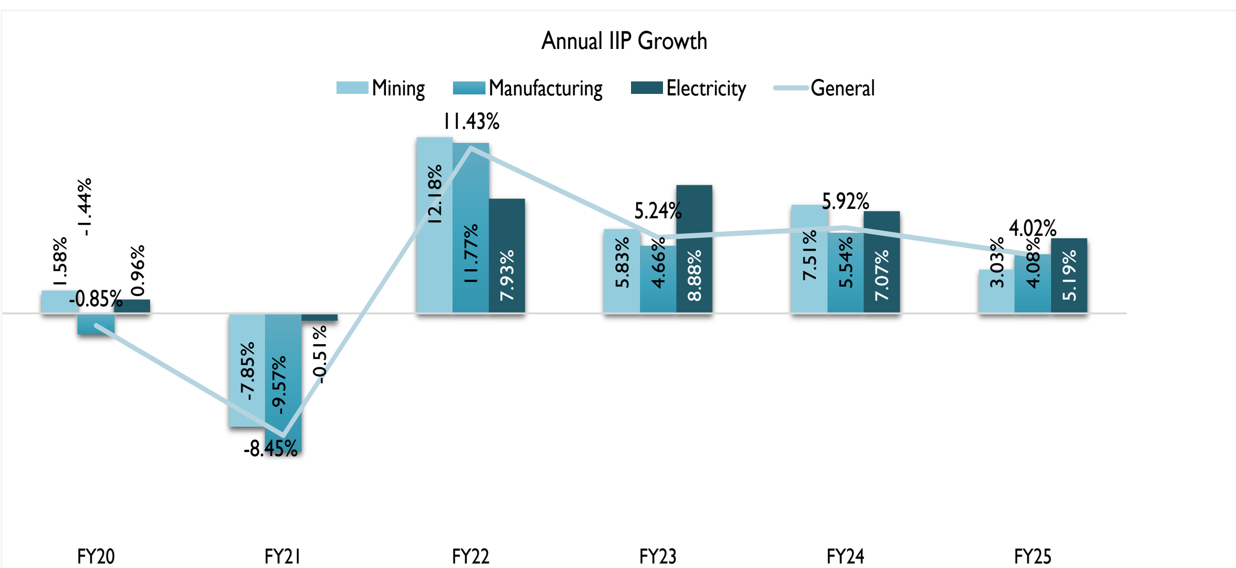
in FY 2028. Overall Gross Value Added (GVA) growth also moderated during this period, easing from 6.41% in FY 2025 to 6.05% in FY 2028.

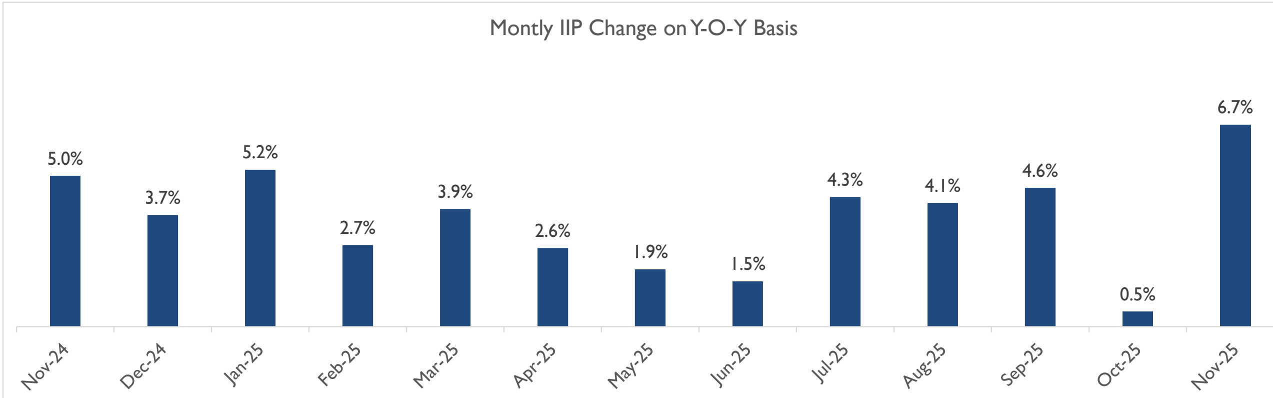
Industrial sector growth followed a stable but mildly easing trajectory, expanding by 6.41% in FY 2025, improving slightly to 6.15% in FY 2026, and then softening to 5.96% in FY 2027 and 5.62% in FY 2028. Within the industrial sector, growth moderated across subsectors, with mining and construction activities recording –0.69% and 7.03% growth, respectively, in FY 2026, compared with 2.69% and 9.35% in FY 2025. Looking ahead, mining output is expected to improve to 2.10%, while construction activity is projected to ease to 6.54% by FY 2028. Growth in the utilities segment also slowed, moderating to 2.07% in FY 2026 from 5.88% in the previous year. Reflecting these trends, the industrial sector's contribution to GVA declined slightly from 30.66% in FY 2025 to 30.32% in FY 2026, with a further moderation expected to 30.03% by FY 2028.

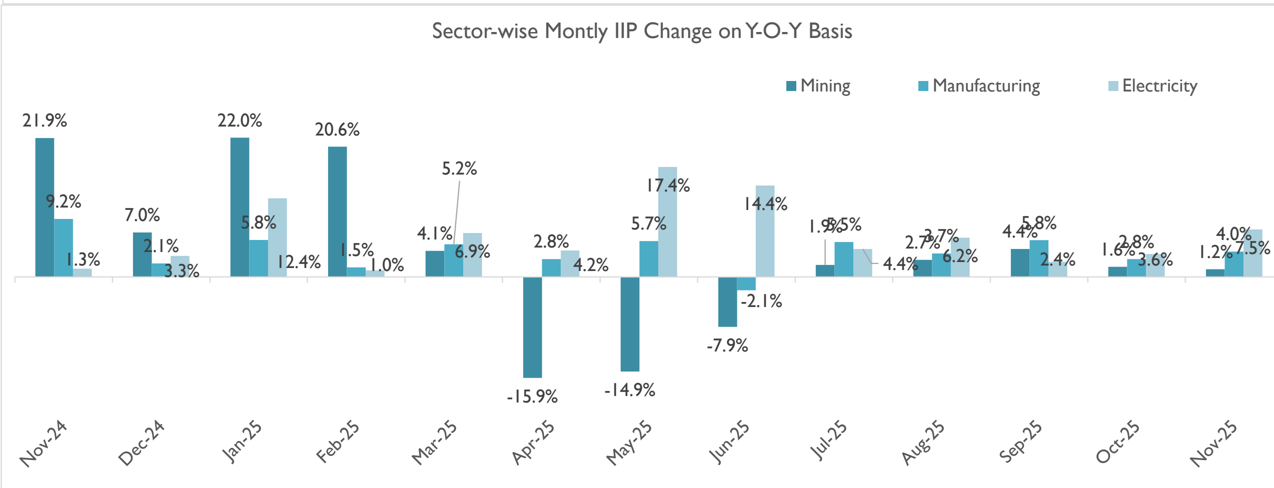
The services sector continued to be the main driver of economic growth. It expanded by 9.12% in FY 2026 from 7.19% in FY 2025. The services sector retained its position as the largest contributor to GVA, rising from 54.53% in FY 2024 to 54.93% in FY 2025, with a further increase to 57.08% in FY 2028.

Annual & Monthly IIP Growth

Industrial sector performance as measured by IIP index exhibited moderation in FY 2025, recording a 4.02% y-o-y growth against 5.92% increase in the previous year. The manufacturing index showed moderation and grew by 4.08% in FY 2025 against 5.54% in FY 2024. Mining sector index too moderated and exhibited a growth of 3.03% in FY 2025 against 7.51% in the previous years while the Electricity sector Index, also witnessed moderation of 5.19% in FY 2025 against 7.07% in the previous year.





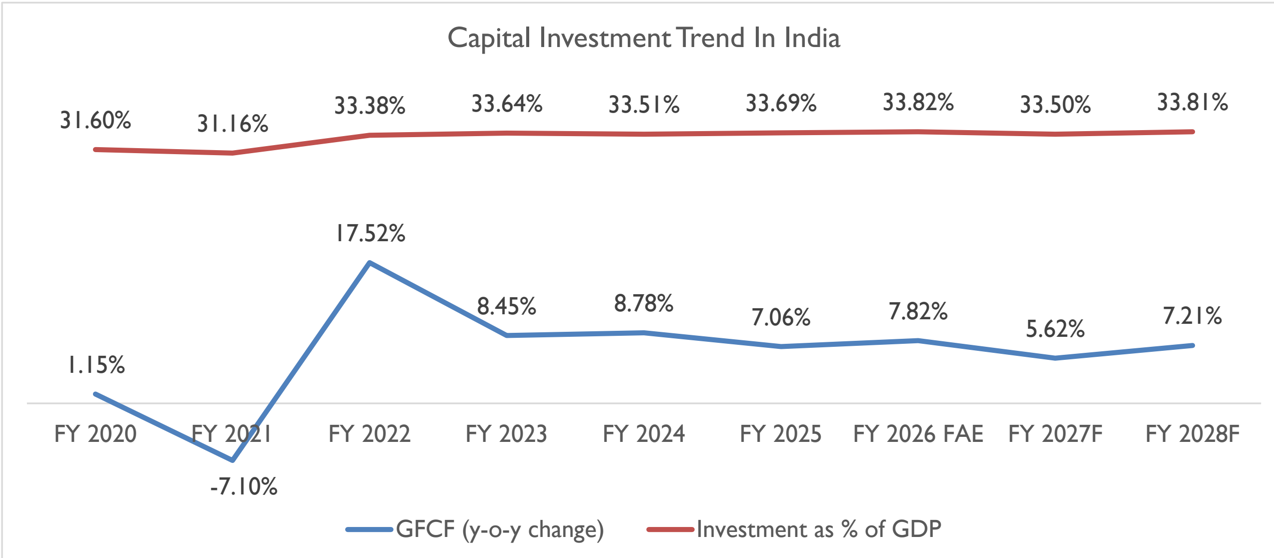


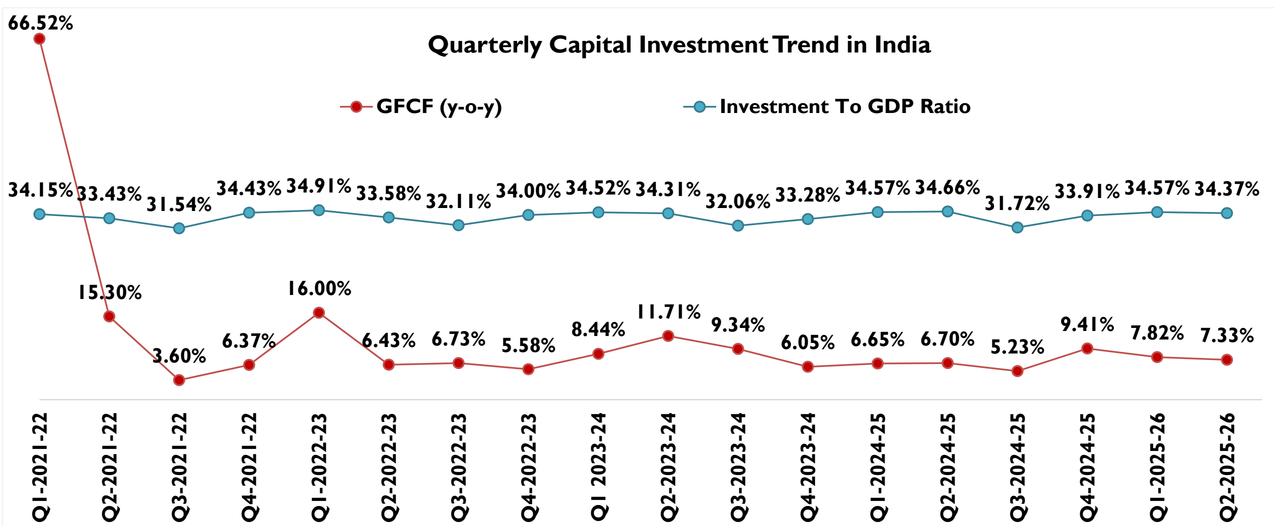
Source: Ministry of Statistics & Programme Implementation (MOSPI)

The IIP growth rate for the month of November 2025 is 6.7% which was 0.5% in the month of October 2025. The growth rates of the three sectors, Mining, Manufacturing and Electricity for the month of November 2025 were 5.4%, 8.0% and -1.5% respectively.

Annual and Quarterly: Investment & Consumption Scenario

Other major indicators such as Gross fixed capital formation (GFCF), a measure of investments, has shown fluctuation during FY 2025 as it registered 7.06% year-on-year growth against 8.78% yearly growth in FY 2024, taking the GFCF to GDP ratio measured to 33.69%.

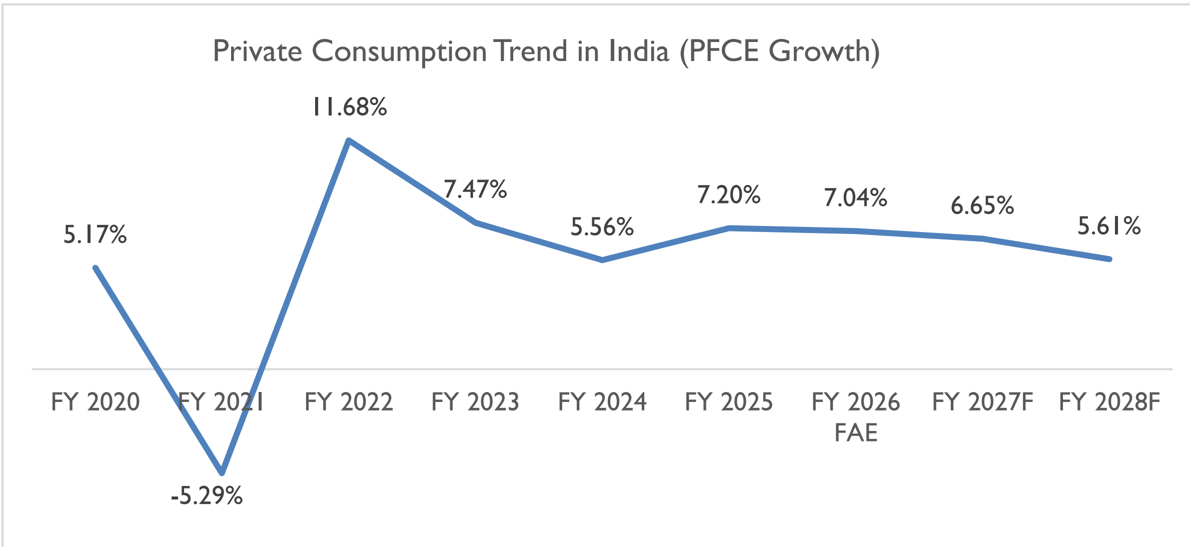


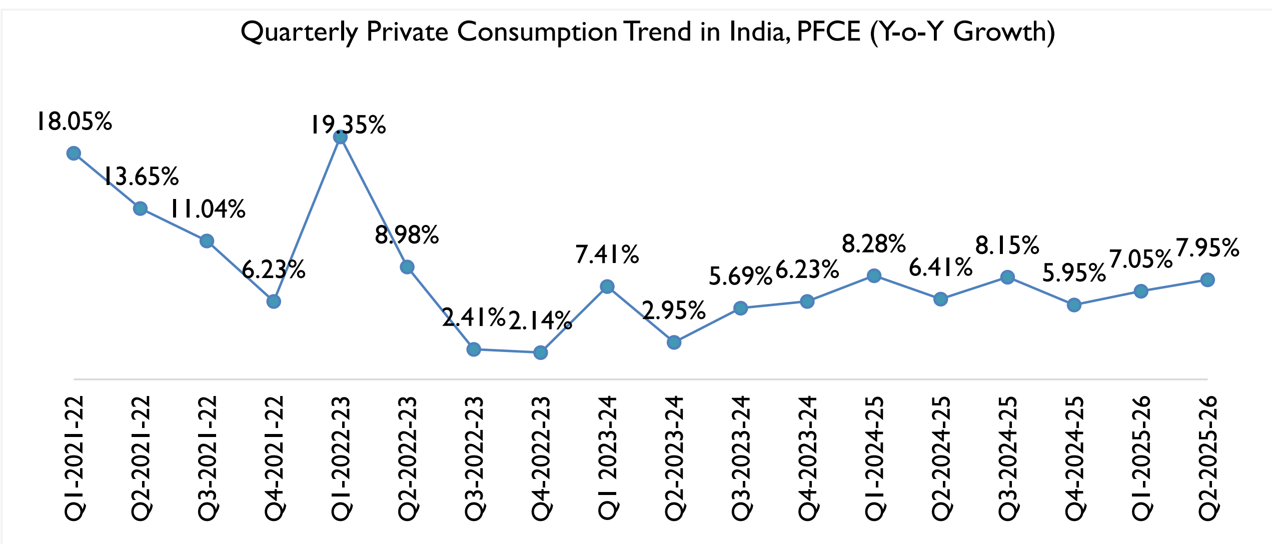


Source: Ministry of Statistics & Programme Implementation (MOSPI), CMIE Economics Outlook

On a quarterly basis, GFCF showed a fluctuating trend in year-on-year growth. After a sharp spike of 66.52% in Q1 FY 2021-22, growth moderated significantly and remained volatile across subsequent quarters. In FY 2024, the growth rate eased to 6.05% in Q3 (Dec quarter) compared to 9.34% in Q2, as government capital spending slowed ahead of the 2024 general election. It improved slightly to 6.65% in Q1 FY 2024-25 but moderated again to 6.70% in Q2 and 5.23% in Q3, before rebounding to 9.41% in Q4. In Q2 FY 2025-26, growth stood at 7.33%, lower than the previous quarter. The GFCF to GDP ratio measured 34.37% in Q2 FY 2025-2026.

Private Consumption Scenario





Sources: MOSPI, CMIE Economics Outlook

Private Final Expenditure (PFCE) a realistic proxy to gauge household spending, observed growth in FY 2025 as compared to FY 2024. Quarterly Private Final Consumption Expenditure (PFCE) has reported 7.95% growth rate during Q2 of FY 2025-26 as compared to the 6.41% growth rate in the corresponding period of previous financial year.

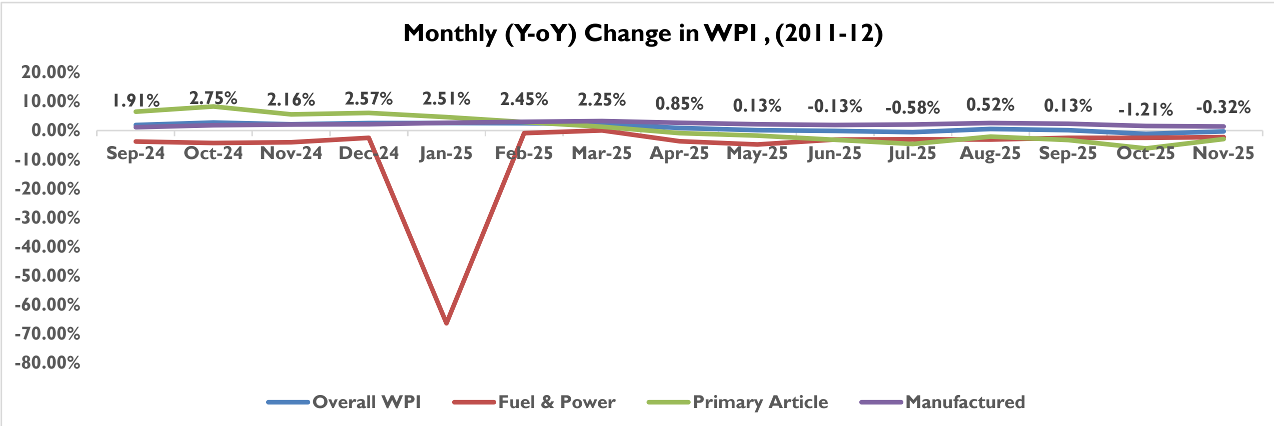
Inflation Scenario

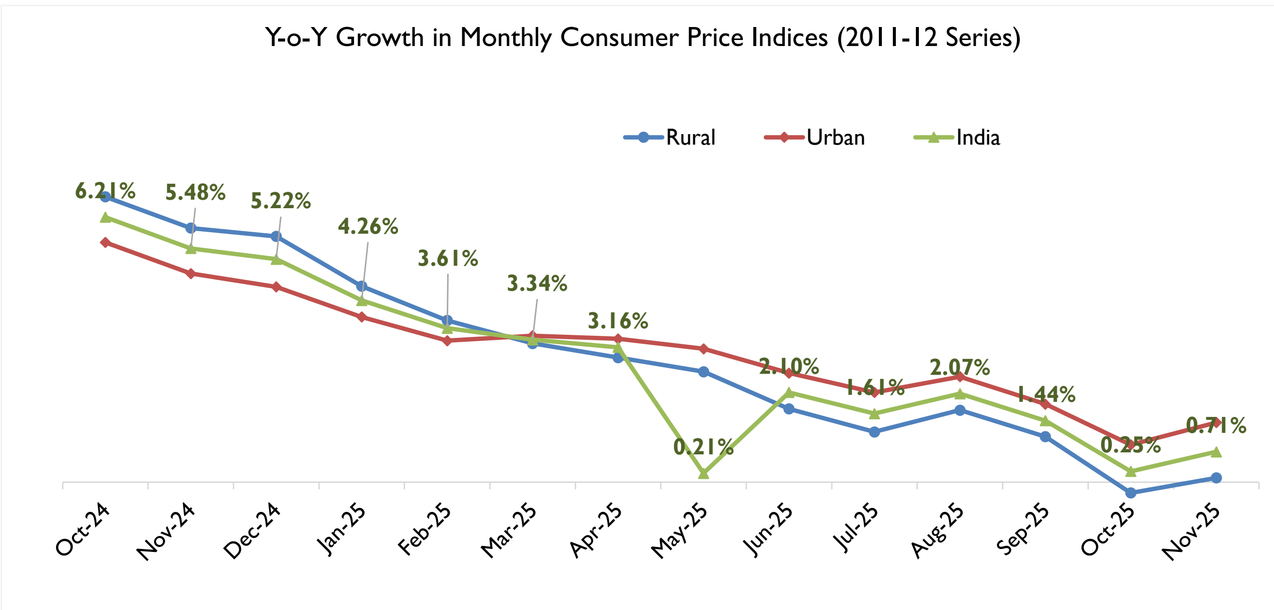
The annual rate of inflation based on All India Wholesale Price Index (WPI) number is (-) 0.32% (provisional) for the month of November 2025 (over November 2024). Negative rate of inflation in November 2025 is primarily due to decrease in prices of food articles, mineral oils, crude petroleum & natural gas, manufacture of basic metals and electricity etc.

Primary Articles (Weight 22.62%): The index for this major group increased by 2.07% from 188.2 (provisional) for the month of October 2025 to 192.1 (provisional) in November 2025. Moreover, the price of minerals (4.50%), food articles (2.50%) and non-food articles (1.28%) increased in November 2025 as compared to October 2025. However, the price of Crude Petroleum & Natural Gas (-1.62%) decreased in November 2025 as compared to October 2025.

Fuel & Power (Weight 13.15%): The index for this major group increased by 1.03% from 145.0 (provisional) for the month of October 2025 to 146.5 (provisional) in November 2025. Furthermore, the price of electricity (6.70%) increased in November 2025 as compared to October 2025. In contrast, the price of mineral oils (0.67%) decreased in November 2025 as compared to October 2025. The price of coal remained same as in the previous month.

Manufactured Products (Weight 64.23%): The index for this major group decreased by (-) 0.07% from 145.1 (provisional) for the month of October 2025 to 145.0 (provisional) in November 2025. In addition, out of the 22 NIC two-digit groups for manufactured products, 14 groups witnessed a decrease in prices, 7 groups witnessed an increase in prices and 1 group witnessed no change in prices. Some of the important groups that showed month-over-month decrease in prices were manufacturers of fabricated metal products, except machinery and equipment; food products; other non-metallic mineral products; computer, electronic and optical products and chemicals and chemical products etc. Conversely, some of the groups that witnessed an increase in prices were other manufacturing; machinery and equipment; textiles; electrical equipment and wearing apparel etc. in November 2025 as compared to October 2025.

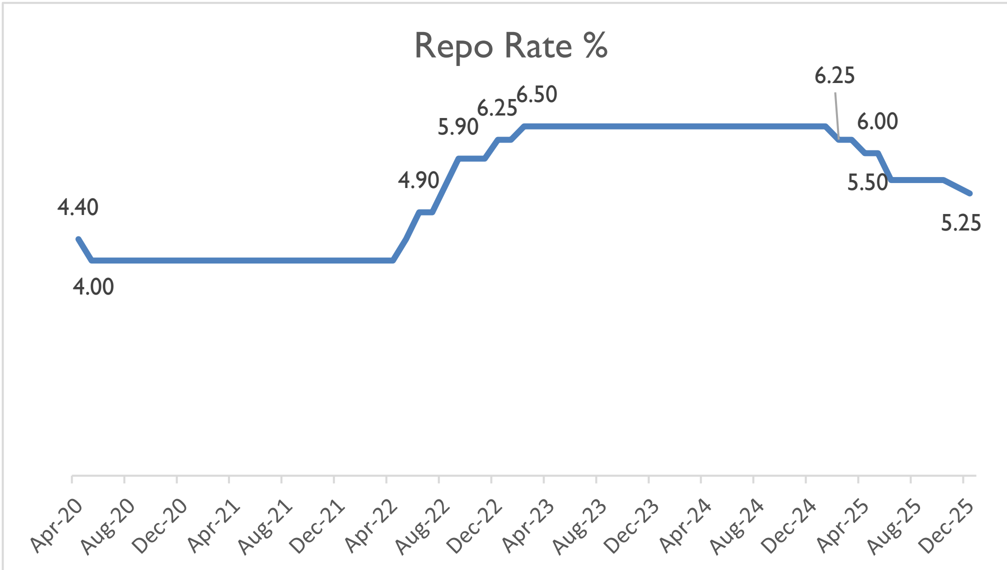




Source: MOSPI, Office of Economic Advisor

Retail inflation rate (as measured by the Consumer Price Index) in India showed notable fluctuations between November 2024 and November2025. Year-on-year inflation rate based on All India Consumer Price Index (CPI) for the month of November 2025 over November 2024 is 0.71% (Provisional). Moreover, there is an increase of 46 basis points in headline inflation of November 2025 in comparison to October 2025.

Rural Inflation: An increase in headline and food inflation in the rural sector is observed in November 2025. The headline inflation is 0.10% (Provisional) in November 2025 while it was -0.25% in October 2025. Furthermore, in urban inflation, an increase from 0.88% in October 2025 to 1.40% (Provisional) in November 2025 is observed in headline inflation of the urban sector. In addition, an increase is also observed in food inflation from -5.18% in October 2025 to -3.60% (Provisional) in November 2025. As part of its anti-inflationary stance, the Reserve Bank of India (RBI) hiked the repo rate by 250 basis points between May 2022 and 8 February 2023, holding it steady at 6.50% until January 2025. On 5 December2025, the RBI reduced the repo rate by 25 basis points, bringing it to 5.25%.



Sources: CMIE Economic Outlook

Growth Outlook

The Union Budget 2026–27 sets out a quantitatively strong push to build resilient supply chains and develop next-generation industrial capacity. The record ₹12.2 trillion capital expenditure outlay aims to ease logistics bottlenecks and enhance India's cost competitiveness. Employment measures extend across both urban and rural India in one sweep. In cities and large towns, capex is channelled into "connectors" such as the seven proposed high-speed rail corridors and upgraded Tier-2 and Tier-3 infrastructure, creating construction, logistics, and service jobs while cutting commute times. In smaller towns and villages, jobs are expected to grow through mega textile parks, the Mahatma Gandhi Gram Swaraj Initiative's push for khadi and handloom, training for tourist guides, and new waterways and coastal shipping. Together, these steps broaden the wage base instead of providing a short-term bump.

Strategic supply chains receive an important push. Dedicated rare earth corridors in Odisha, Kerala, Andhra Pradesh, and Tamil Nadu; customs exemptions for capital goods used in critical mineral processing and battery cells; and the India Semiconductor Mission 2.0 aim to pull manufacturing deeper into components and materials. If executed well, these measures reduce import dependence in magnets, batteries, and chip inputs and lift the share of higher-productivity manufacturing jobs — raising household incomes durably.

The conclusion of the India–EU FTA negotiations mark a major strategic milestone, as it unlocks near-universal market access for 99.5% of India's exports by value and integrates India more deeply into a USD 24 trillion economic bloc. By providing duty-free entry for key labour-intensive sectors, expanding services access, and establishing a mobility framework for Indian professionals, the agreement strengthens India's export competitiveness, supports high-value job creation, and ensures a predictable, rules-based environment for long-term trade and investment flows.

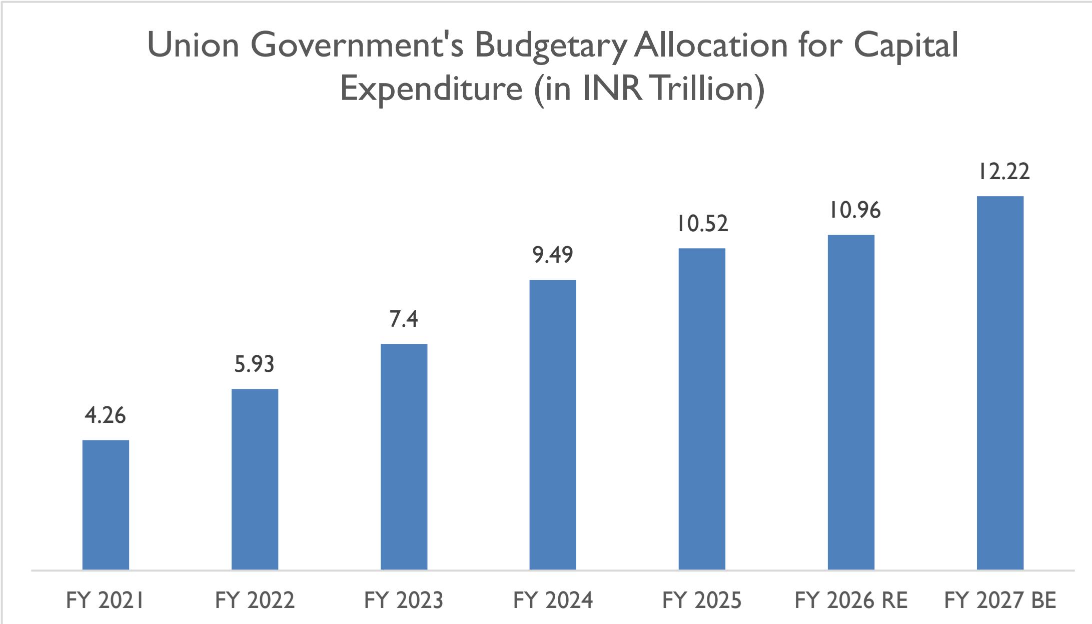
The India–Oman CEPA creates a comprehensive framework covering goods, services, investment, and regulatory cooperation. With bilateral trade at USD 10.61 billion in FY 2024–25, the CEPA grants India 100% duty-free access across 98.08% of Oman's tariff lines (99.38% of export value) from Day One. This access expands opportunities across engineering goods, pharmaceuticals, agriculture, chemicals, electronics, textiles, marine products, and gems & jewellery, while a calibrated exclusion list protects sensitive domestic and MSME-linked sectors

Key Growth/Demographic Drivers for Economic Growth

Government focus on infrastructure development

The infrastructure sector has received a strong boost in Budget FY27, marked by a record Rs 12.2trn public capital expenditure allocation, reinforcing the government's focus on making assets more efficient and sustainable. The introduction of the landmark Infrastructure Risk Guarantee Fund aims to provide partial credit guarantees to lenders and revitalise private sector participation in large-scale projects. By lowering project risk premiums and easing borrowing costs, this mechanism is likely to help crowd in private capital and accelerate construction phase financing across the sector. The transport and logistics sector, in particular, will buoy infrastructure growth. Railways have received a substantial boost in allocation, which will help support the planned development of seven new high speed rail corridors and a Dankuni-Surat DFC, which aims to cut logistics costs and improve national connectivity. Moreover, the rollout of 20 new National Waterways, new ship repair hubs and a scheme to double the share of coastal and inland water transport from 6.0% to 12.0% by 2047 will together build a greener, more efficient multimodal freight network. Urban transformation continues through targeted development of Tier 2 and Tier 3 cities – with populations over 0.5mn – alongside the creation of City Economic Regions, each supported by multi year challenge based financing to establish new growth hubs and reduce pressure on metros. A broader ecosystem of reforms strengthens medium term sector prospects. The government aims to scale domestic construction and infrastructure equipment manufacturing, reducing import dependence and improving execution capability in tunnelling, metro construction and road building machinery. The monetisation of CPSE assets will be accelerated through dedicated REIT structures, helping unlock liquidity for redevelopment and new project pipelines. Additional support flows through region specific initiatives, such as industrial corridor expansion, and tourism development in cultural and Buddhist heritage zones will further reinforce construction demand.

Together, these measures will strengthen India's infrastructure ecosystem through higher public investment, improved risk mitigation tools and wider multimodal connectivity – creating a constructive environment for sustained growth in construction, logistics and urban development.



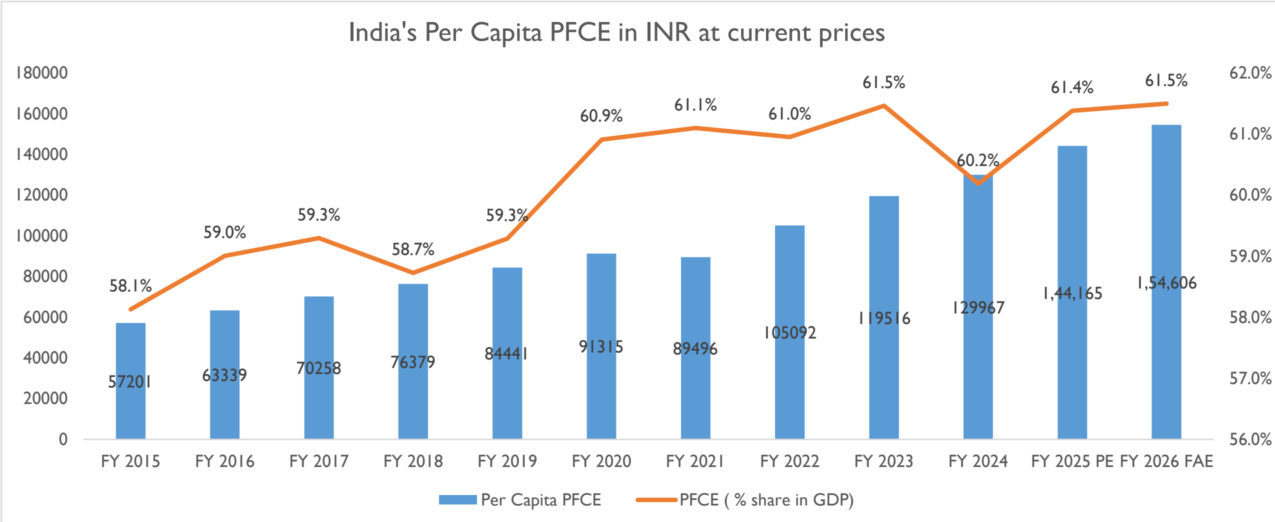
Union Budget, Government of India

Development of Domestic Manufacturing Capability

The Government launched Production Linked Incentive (PLI) scheme in early 2020, initially aimed at improving domestic manufacturing capability in large scale electronic manufacturing and gradually extended to other sectors. At present it covers 14 sectors, ranging from medical devices to solar PV modules. The PLI scheme provides incentives to companies on incremental sales of products manufactured in India. This incentive structure is aimed to attracting private investment into setting up manufacturing units and thereby beef up the domestic production capabilities. The overall incentives earmarked for PLI scheme is estimated to be INR 2 trillion. If fully realizing the PLI scheme would have the ability to add nearly 4% to annual GDP growth, by way of incremental revenue generated from the newly formed manufacturing units.

Strong Domestic Demand

Domestic demand has traditionally been one of the strong drivers of Indian economy. After a brief lull caused by Covid-19 pandemic, the domestic demand is recovering. Consumer confidence surveys by Reserve Bank / other institutions are points to an improvement in consumer confidence index, which is a precursor of improving demand. India has a strong middle-class segment which has been the major driver of domestic demand. Factors like fast paced urbanization and improving income scenario in rural markets are expected to accelerate domestic demand further. This revival is perfectly captured by the private final consumption expenditure (PFCE) metric. The PFCE at current prices is on steady rise from FY 2022 onwards. Between FY 2015-26, PFCE in India has improved by nearly 2.5 times its share in GDP has increased from 58.1% to about 61.5% in FY 2026 (as per the first advance estimates).

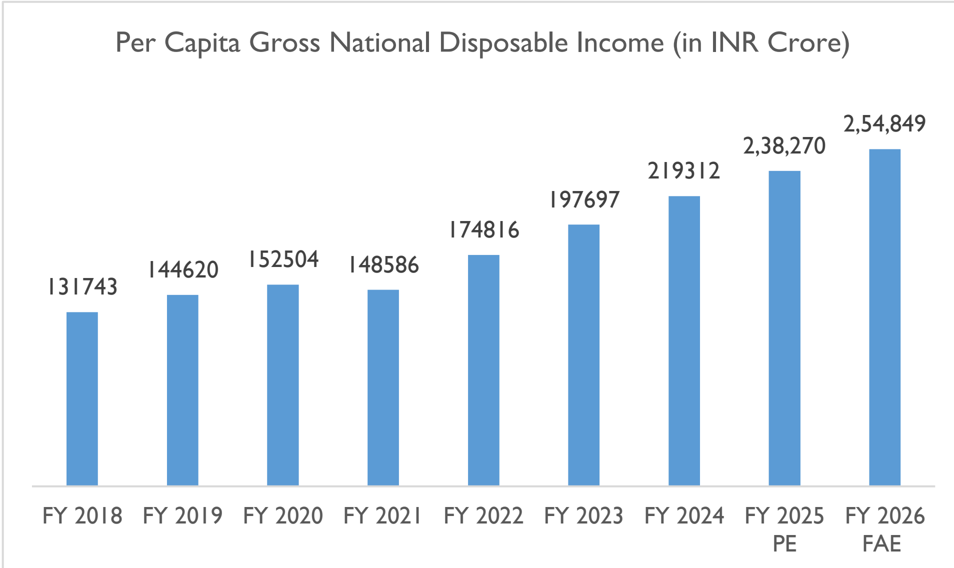


Source: Ministry of Statistics & Programme Implementation (MOSPI)

There are two factors that are driving this domestic demand: One the large pool of consumers and second the improvement in purchasing power.

- The share of middle class increased from nearly 14% in 2005 to nearly 30% in 2021 and is expected to cross 60% by 2047 [2]. This expanding middle class household segment is fuelling India's growth story and would continue to play a key role in propelling India's economic growth.
- Consumer driven domestic demand is majorly fuelled by this growth in per capita income. As per National Statistics Office (NSO) As per National Statistics Office (NSO), India's per capita net national income (at constant prices) stood at INR 1,21,968 crore in FY 2026 against INR 1,14,710 crore in FY 2025 and INR 87,586 in FY 2018. This increase in per capita income has impacted the purchasing pattern as well as disposable income. The disposable income during the FY 2018-26 has increased from INR 131,753 to INR 2,54,849 increasing at CAGR 9.2%.

[2] As per the survey conducted by People Research on India's Consumer Economy. Households with annual income in the range of INR 5 – 30 lakh is considered as middle-class households.

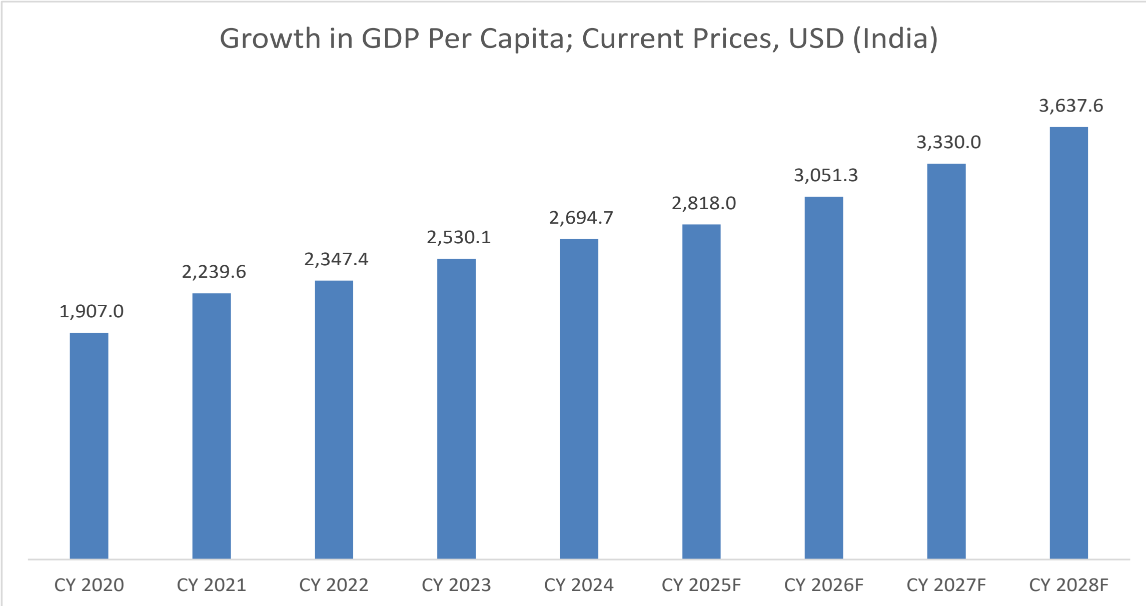


Source: Ministry of Statistics & Programme Implementation (MOSPI)

India's Per capita GDP trends

India is poised to become the world's third-largest economy with a projected GDP of USD 5 trillion within the next three years, driven by ongoing reforms. As one of the fastest-growing major economies, India currently holds the position of the fifth-largest economy globally, following the US, China, Japan, and Germany. By 2027-28, it is anticipated that India will surpass both Germany and Japan, reaching the third-largest spot. This growth is bolstered by a surge in foreign investments and a wave of new trade agreements with India's burgeoning market of 1.4 billion people. The aviation industry is witnessing unprecedented orders, global electronics manufacturers are expanding their production capabilities, and suppliers traditionally concentrated in southern China's manufacturing hubs are now shifting towards India.

To achieve its vision of becoming the world's third-largest economy by 2027-28, India will need to implement transformative industrial and governmental policies. These policies will be crucial for sustaining the consistent growth of the nation's per capita GDP over the long term.

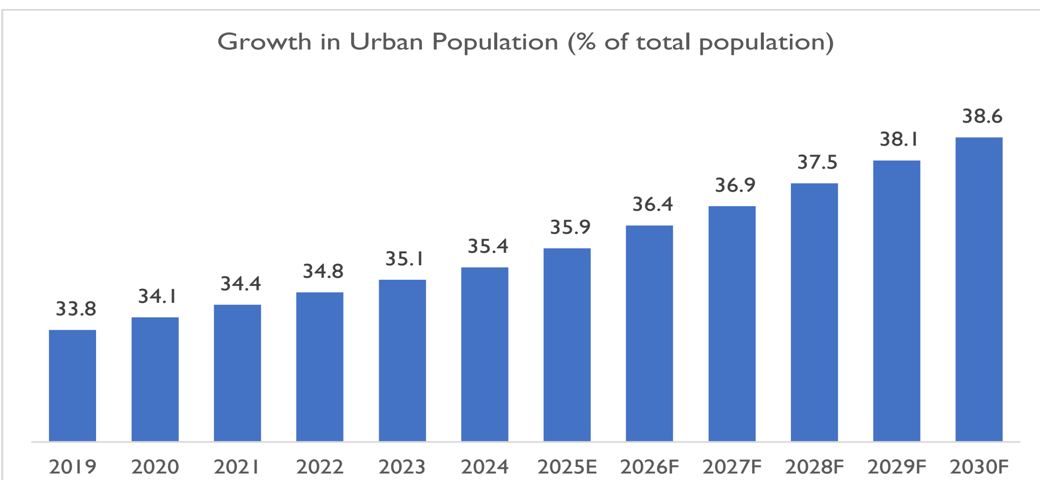


Source: IMF

From CY 2024-30, India's per capita GDP is projected to grow at a compound annual growth rate of 7.8%. This growth will be driven by the service sector, which now accounts for over 50% of India's GDP, marking a significant shift from agriculture to services.

Increasing Urbanization

As per the handbook of urban statistics 2022, India's urban population has been on a steady rise, with urban dwellers accounting for over 469 million in 2021, is projected to soar to over 558 million by 2031 and further exceed to 600 million by 2036.



Source: World Bank, [3] D&B Research and Estimates

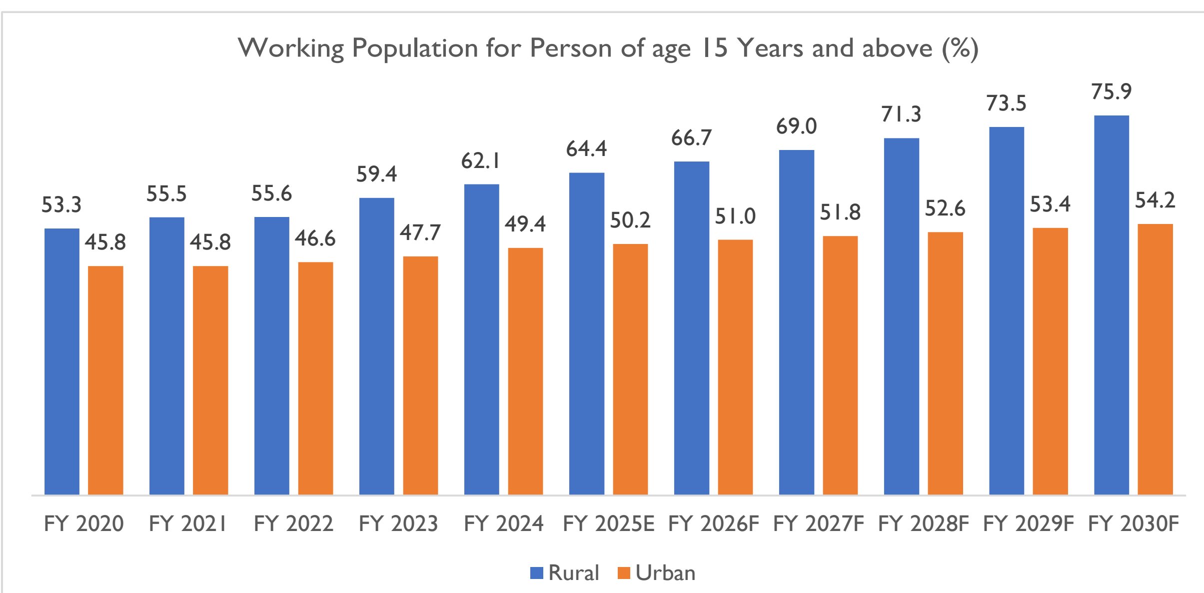
[3] https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?end=2022&locations=IN&skipRedirection=true&start=1960&view=chart

The share of urban population in total population has been quickly escalating. In 2019, 33.81% of the total population was urban. By 2024, its has reached to 35.38%, showing an increment of 1.15% in span of five years. The share of urban population is further forecasted to cross 40% by 2030. This increase in urban population is set to demand drastic changes in infrastructure development. Cities are a major driver for the construction industry. With cities expanding rapidly, there will be an increased need for improved housing, water supply, sewage systems, and electricity. Urban planning will need to account for higher population densities, necessitating the development of smart cities with integrated technology for efficient management of resources and services. The Smart Cities Mission targeted at 100 cities is aimed at improving the quality of life through modernized/ technology driven urban planning. This transformation will also require significant investment in public health, education, and recreational facilities to enhance the quality of urban living. The surge in urban population will also propel demand for improvement in multimodal transport infrastructure for freight and passenger travel requirement..

Rural Vs Urban Working Population Age Group

As India continues to experience economic growth and development, the working population in both rural and urban areas is increasing. In case of urban population, this growth is marked from a share of 45.8% in FY20 to 49.4% in FY24, whereas in rural areas, it grew from 53.3% in FY20 to 62.1% in FY24.

This growth is driven by a combination of factors, including demographic changes, economic policies, and the expansion of various industries. The rise in employment opportunities across sectors such as agriculture, manufacturing, services, and information technology has contributed to the overall increase in the working population, thereby fostering economic stability and enhancing the standard of living for many Indians.

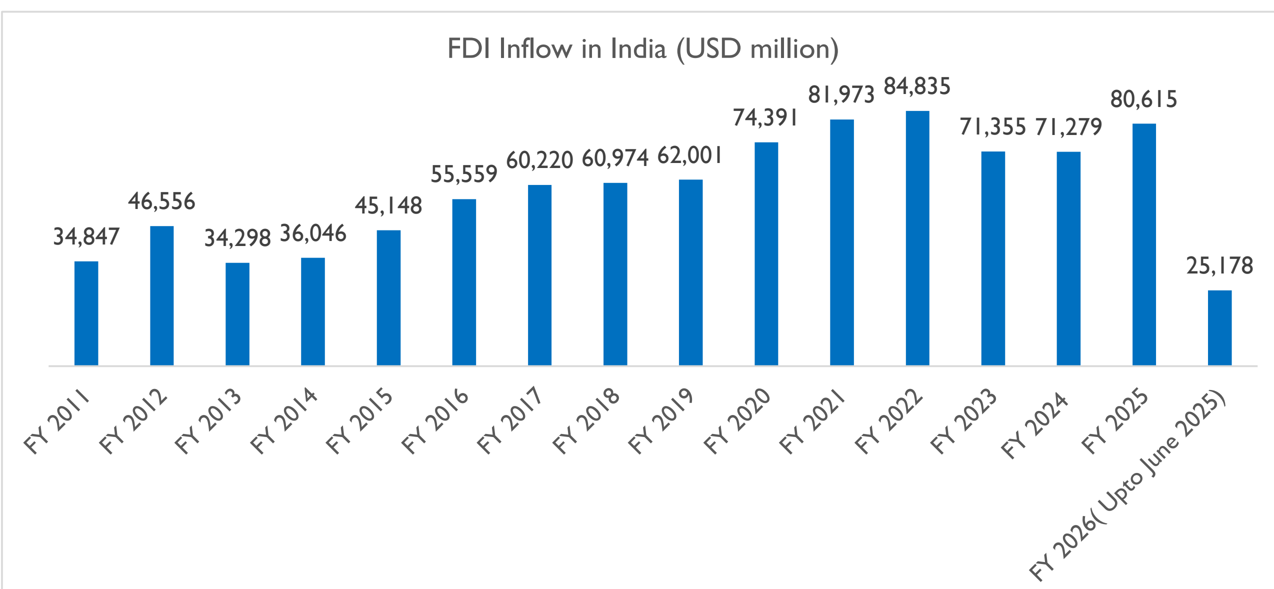


Source: Periodic Labour Force Survey (PLFS) Annual Report 2023-2024, D&B Research and Estimates

In urban areas, the working population is growing rapidly due to the proliferation of jobs in sectors like IT, finance, retail, and healthcare. Additionally, the development of infrastructure, such as improved transportation networks and housing, has made urban centers more accessible and desirable for the working population. In rural areas, the working population remains substantial, primarily due to the dominance of the agricultural sector. Government initiatives aimed at rural development, such as improved access to education and skill development programs, have also played a crucial role in enhancing employment prospects in these regions. The dominance of the rural working population over their urban counterparts can be attributed to the agricultural sector's labour-intensive nature ensures a consistent demand for human labor despite advancements in mechanization, sustaining employment rates in rural areas.

Foreign Direct Investment Trend in India

FDI inflow in India has observed a steady increase between FY 2013 till FY 2022 while it witnessed a decline of 15% in FY 2023 and of -0.1% in FY 2024 due to several factors, including the ongoing conflict between Russia and Ukraine, changes in US monetary policy, and other global uncertainties. However, the country has received substantial FDI inflow between from April 2000-December 2024. This increasing FDI can be attributed to the new investment facilitation measures like the National Single-Window System (NSWS), which streamlines the approval and clearance process for investors, entrepreneurs, and businesses sectoral along with PLI schemes, emerging growth prospects in tier-2 and tier-3 cities. Further, tax compliance for startups and foreign investors have been simplified where the Income Tax Act, 1961 has been amended in 2024 to abolish angel tax and to reduce income tax rate chargeable on income of a foreign company.



Sources: Department for Promotion of Industry and Internal Trade

- As per World Investment report 2025, India ranking improved by one position to rank 15th place for global FDI destinations, attracting USD 27.6 billion as an FDI destination in 2024, up from 16th in 2023.
- India ranked as the 4th largest recipient of greenfield projects with 1,080 greenfield projects in 2024 announcements, as per the World Investment Report 2025.

Electricity Generation, Transmission & Distribution (T&D) Scenario in India

Brief overview of electricity landscape in India: generation, transmission & distribution segments

India's electricity industry is separated in three different segments: (i) Electricity Generation; (ii) Transmission; and Distribution. India's electricity landscape is characterized by its vast, diverse, and rapidly evolving infrastructure that supports one of the world's largest and most complex power systems. The country's electricity ecosystem is shaped by a mixed energy basket, including thermal, hydro, nuclear, and a growing share of renewable energy sources. With growing industrialization, urbanization, and rural electrification, the demand for electricity continues to rise steadily, pushing the sector towards capacity expansion, technological upgrades, and policy reforms. India's power sector has undergone significant transformation, particularly in terms of increasing private sector participation, regulatory structuring, and focus on sustainability.

Government-led reforms, institutional restructuring, and schemes like "Power for All" have focused on ensuring universal access, improving power quality, and modernizing outdated infrastructure. These efforts are aligned with India's broader goals of energy security, affordability, and environmental sustainability. Institutions like the Ministry of Power, Central Electricity Authority (CEA), and state electricity boards play key roles in policy implementation and system coordination. Additionally, renewable energy integration and grid modernization have become central themes in recent years, aided by national missions and smart grid initiatives.

Generation Segment:

Electricity generation in India operates through a mixed portfolio of energy sources that include coal, gas, hydro, nuclear, and renewable sources such as solar and wind. Historically, coal-based thermal power has dominated, but the country is steadily diversifying toward cleaner options. The generation landscape includes central public sector undertakings, state-owned plants, and a significant share of private players, especially in renewables. This competitive and layered structure promotes capacity expansion, pricing efficiency, and innovation in generation technologies.

The government has set ambitious targets for renewable energy generation, prompting a surge in solar parks, wind farms, and hybrid energy projects. The policy framework promotes independent power producers and facilitates bidding mechanisms that ensure competitive tariffs. Technological innovations like ultra-supercritical coal plants, floating solar panels, and offshore wind projects are being explored to increase generation efficiency and reduce carbon footprints. Decentralized generation through rooftop solar and bioenergy also plays a growing role, particularly in rural and remote areas.

Transmission Segment:

India's electricity transmission segment acts as the backbone of the power sector, enabling the transfer of electricity from generating stations to distribution networks across states and regions. The national grid, operated by the Power Grid Corporation of India and other state-level entities, is structured to handle high-voltage bulk transfers across long distances. A key characteristic of the Indian transmission system is its increasing inter-regional connectivity, ensuring resource optimization and power availability across different parts of the country.

The transmission segment has witnessed significant modernization with the introduction of high-voltage direct current (HVDC) lines, smart grid technologies, and real-time monitoring systems. Policies have encouraged private sector participation through tariff-based competitive bidding and joint ventures, contributing to both capacity and operational efficiency. Transmission planning has become increasingly aligned with the expansion of renewable energy, with the development of dedicated green energy corridors and grid integration solutions for variable power sources.

Distribution Segment:

The distribution segment is the most consumer-facing part of the electricity value chain and also the most stressed. It involves delivering power from substations to end-users, including residential, commercial, agricultural, and industrial consumers. Distribution utilities primarily state-owned discoms have long grappled with issues like technical and commercial losses, poor billing efficiency, and financial distress. This has led to service reliability concerns and impacted the overall viability of the power sector.

Reforms in the distribution space have gained momentum through initiatives aimed at improving efficiency, reducing aggregate technical and commercial (AT&C) losses, and ensuring financial sustainability. Schemes promoting smart metering, feeder segregation, and prepaid billing are helping utilities improve operations and customer experience. Additionally, privatization of discoms and performance-linked incentives are being explored in several regions to enhance accountability and service quality. However, structural issues like cross-subsidization, outdated infrastructure, and limited tariff rationalization continue to hinder the progress. Moving forward, the emphasis is on digital transformation, regulatory clarity, and consumer-centric approaches to make the distribution system more robust and responsive. Technologies like artificial intelligence for load forecasting, blockchain for energy trading, and integrated energy platforms are gradually reshaping the distribution ecosystem in India.

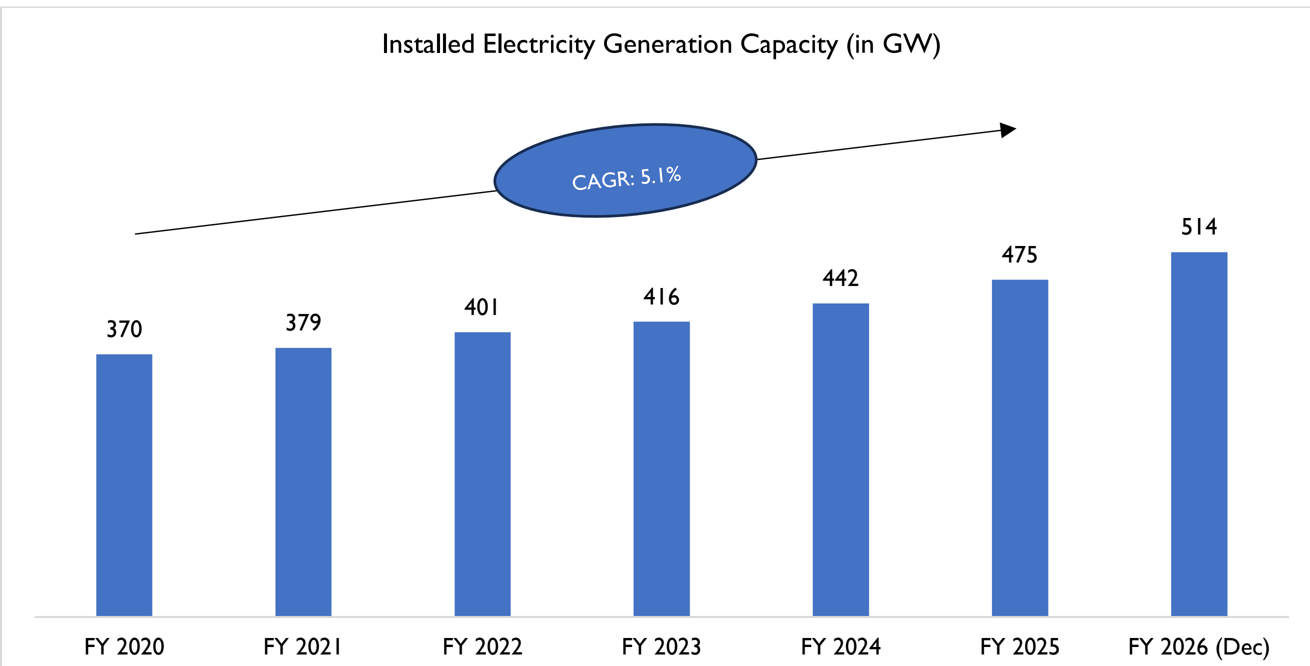
Generation Scenario

India's electricity generation scenario is undergoing a significant transformation, driven by a shift from conventional fossil-fuel-based sources toward a more diversified and sustainable energy mix. While coal remains a dominant player in baseload generation, there is strong policy and investment momentum around renewable energy particularly solar, wind, and hydro to enhance energy security and reduce environmental impact. Public sector utilities, private independent power producers, and state-level generators contribute to a competitive and evolving generation landscape. The focus is now expanding beyond capacity addition to include efficiency, cleaner technologies, and improved grid integration, especially as decentralized and variable sources like rooftop solar become more prevalent across rural and urban regions.

Installed electricity generation capacity: current scenario & historical growth trends (last 5 years)

Electricity demand in India has grown exponentially on the back of rapid urbanization, and large-scale industrialization. The two factors have increased the pool of consumers, as well as increased the per-unit consumption. This developing demand landscape has led to a rapid scale-up in the generation sector, with capacity addition happening across thermal, hydroelectric, nuclear, and renewable energy.

Installed Capacity



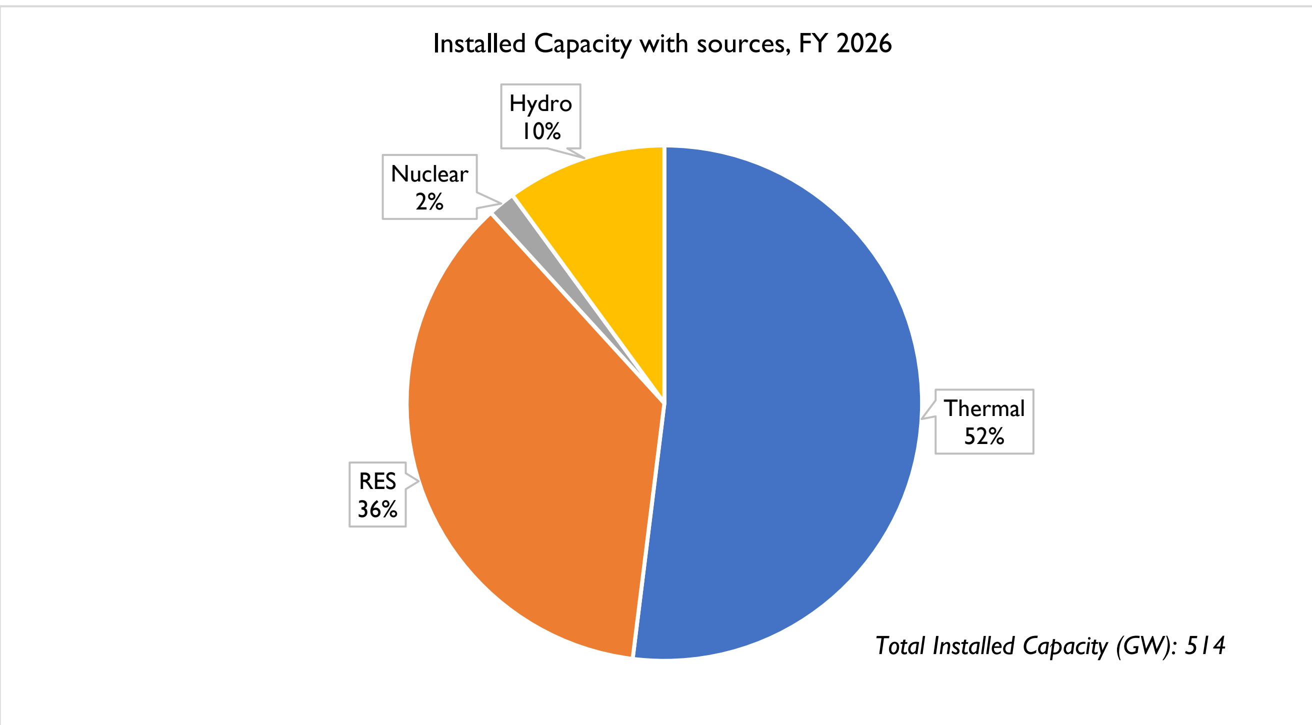
Source: Central Electricity Authority, Ministry of Power

India's installed electricity generation capacity has recorded steady growth over recent years, increasing from 370 GW in FY 2020 to 475 GW in FY 2025, representing a CAGR of 5.1%. This consistent expansion reflects the country's sustained efforts to strengthen its power infrastructure in line with rising energy demand across industrial, commercial, and residential segments. Capacity additions have been driven by continued investments in both conventional and renewable energy sources, highlighting a strategic focus on energy diversification, reliability, and long-term sustainability.

The growth momentum has further accelerated in FY 2026, with installed electricity generation capacity reaching 514 GW as of December 2025, underscoring India's proactive approach to ensuring energy security. As of FY 2025, the installed base of 475.2 GW already reflected a well-diversified energy mix, and the subsequent increase reinforces national objectives of supporting economic growth, expanding energy access, reducing import dependence, and transitioning toward a cleaner and more resilient power system.

Generation capacity by sources (thermal / renewable / hydro / others)

India's electricity generation capacity is built on a diverse mix of energy sources, structured to balance energy security, affordability, and environmental sustainability. Thermal power, primarily coal-based, has historically dominated the installed capacity due to its reliability in providing continuous baseload power. Natural gas and lignite contribute smaller portions within the thermal category. Over time, the country has significantly expanded its non-fossil fuel capacity, particularly in the renewable energy space, driven by supportive policy frameworks, technological advances, and international climate commitments. sources, with a growing emphasis on grid flexibility, energy storage, and hybrid systems to support the integration of variable renewable energy.



Source: Central Electricity AuthorityRenewables, including solar, wind, small hydro, and biomass, now form a key pillar of India's installed capacity strategy, with solar and wind showing strong year-on-year growth. Large hydroelectric projects, while technically renewable, are often tracked separately and continue to play a critical role in peak power and grid balancing. Other sources like nuclear energy provide clean baseload power, though their share remains modest due to long development timelines and regulatory complexities. Overall, India's capacity mix is shifting steadily toward cleaner

Thermal power continues to dominate the energy landscape, accounting for 52% of the total installed capacity, or 246.93 GW. This includes coal, lignite, gas, and diesel-based generation. Despite growing environmental concerns, thermal power remains the backbone of India's electricity supply due to its ability to provide consistent base-load power and support grid stability, particularly in regions with high demand and limited renewable penetration.

Renewable Energy Sources (RES), comprising solar, wind, biomass, and small hydro, make up 36% of the installed capacity, totalling 172.36 GW. This significant share reflects India's strong commitment to clean energy, driven by ambitious government targets, favourable policy frameworks, and increased private sector participation. Solar and wind energy, in particular, have seen rapid growth due to falling technology costs and large-scale project implementation under national missions.

Hydropower contributes 10% of the capacity (47.72 GW), reinforcing its role as a flexible and dispatchable renewable source. Hydropower not only aids in peak load management but also supports grid balancing, especially with the growing share of intermittent renewables like solar and wind. Meanwhile, nuclear energy, with a capacity of 8.18 GW (or 2%), provides a stable, low-emission base-load alternative and continues to play a supporting role in India's clean energy ambitions.

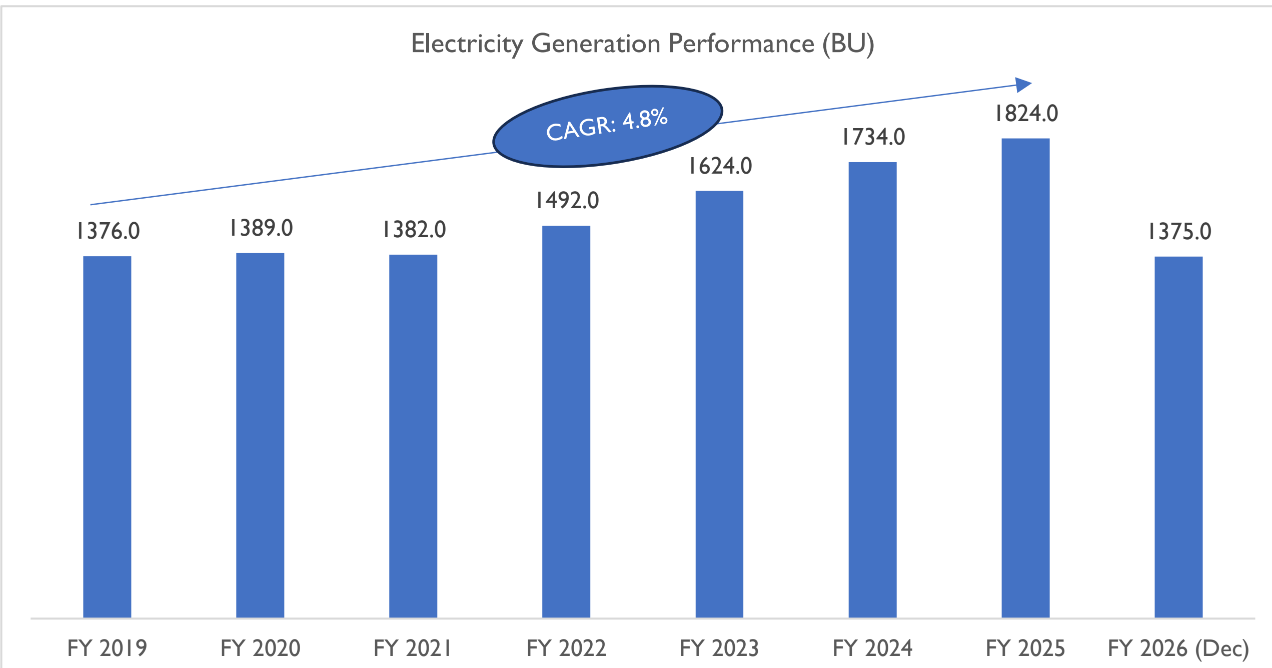
This distribution of capacity in FY 2025 reflects India's multi-pronged approach to energy planning, maintaining reliable conventional generation while accelerating the shift toward greener and more sustainable energy solutions.

Electricity generation scenario in India: current scenario & historical growth trend in generation (last 5 years)

India's electricity generation landscape is marked by a diversified energy mix and a strong emphasis on capacity expansion to meet rising demand. While India's Generations segment has been predominantlydominated by thermal power sources, there has been a significant shift towards renewable energy sources (consisting of solar, wind, biomass, and small hydro), in line with climate commitments and sustainability goals. The government has implemented numerous policy initiatives to promote clean energy, enhance grid integration, and ensure a reliable supply. With a focus on self-reliance and energy security, India is also investing in nuclear power and emerging technologies like green hydrogen and battery storage. The sector is undergoing a transformation with increasing private participation, digitalization of power assets, and enhanced efficiency through modern generation techniques and environmental compliance.

India's electricity generation performance has demonstrated a steady growth trend over recent fiscal years, reflecting expanding generation capacity alongside rising electricity demand. Total electricity generation, measured in billion units (BU), exhibited a clear upward trajectory from FY 2019 to FY 2025, registering an overall Compound Annual Growth Rate (CAGR) of 4.8%. Generation stood at 1,376 BU in FY 2019, increased marginally to 1,389 BU in FY 2020, and moderated slightly to 1,382 BU in FY 2021. A stronger recovery was observed in FY 2022, with generation rising to 1,492 BU, followed by sustained growth to 1,624 BU in FY 2023.

The upward trend continued, with electricity generation reaching 1,824 BU in FY 2025, reflecting robust demand growth and improved supply availability. In FY 2026, electricity generation has remained strong, with 1,375 BU generated as of December 2025, indicating a healthy pace of production within the first nine months of the fiscal year. This sustained performance underscores India's improving power sector efficiency and its ability to meet rising consumption driven by economic activity, urbanisation, and increasing electrification across sectors.



Source: Ministry of Power

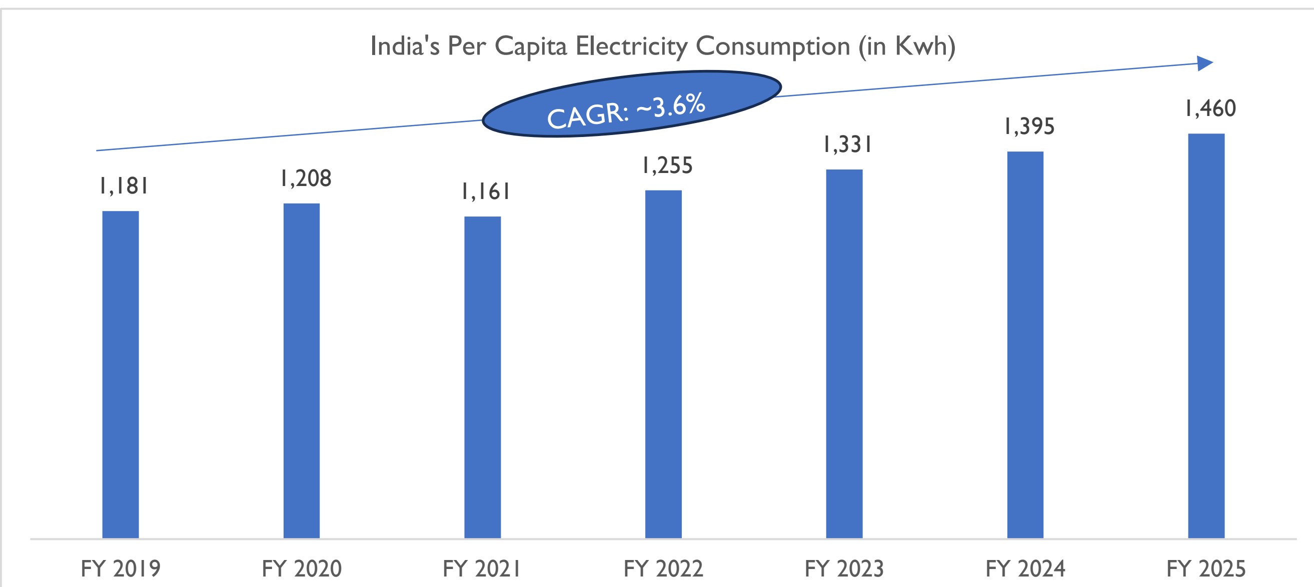
This growth can be attributed to various factors, including improvements in power generation infrastructure, higher utilization of existing capacity, and the addition of new generation projects. It also reflects the country's ongoing efforts to meet the rising electricity demand driven by population growth, urbanization, and economic development.

The steady increase in electricity generation performance underscores the effectiveness of India's energy policies and investment in the power sector. The electricity generation performance reveals a strong and positive trend, reflecting India's expanding power sector and its ability to meet growing electricity demand. The consistent growth in generation capacity is indicative of a well-functioning energy sector poised to support the country's future development needs.

Tracking the per capita electricity consumption growth in India (last 5 years)

India's Per Capita Electricity Consumption

India's per capita electricity consumption has been steadily increasing over the years, reflecting its rapid industrialization, urbanization, and efforts to electrify rural areas. The per capita consumption, measured in kilowatt-hours kWh, exhibited a consistent increase from FY 2019 to FY2025, with an overall CAGR of 3.4%. In FY 2019, the per capita consumption stood at 1,181 kWh. This figure increased modestly to 1,208 kWh in FY 2020. Despite a slight dip to 1,161 kWh in FY 2021, the consumption rebounded to 1,255 kWh in FY 2022. This upward trend continued into FY 2023, with per capita consumption reaching 1,331 kWh. This upward trend continued into FY 2024, with per capita consumption reaching 1,395 kWh. The latest data for FY2025 indicates a further rise to 1,460 kWh. This growth trajectory signifies an ongoing rise in electricity demand, likely driven by economic development, increased industrial activity, and improving access to electricity across various regions.



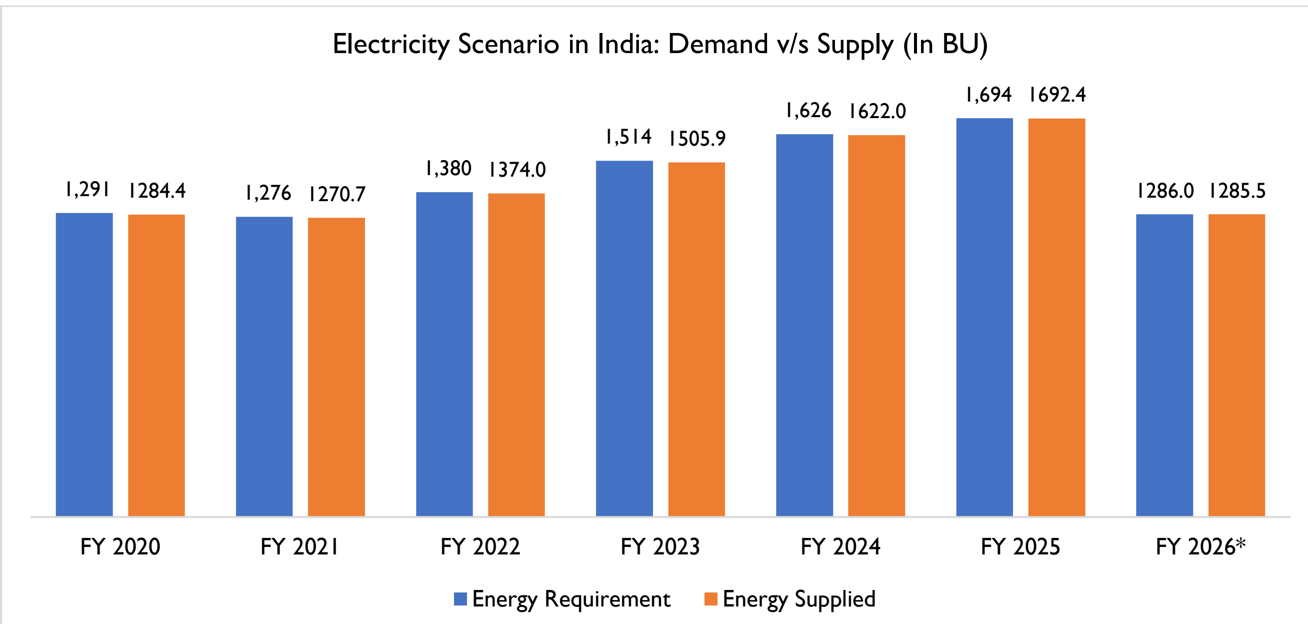
Source: Central Electricity Authority, CEA

Electricity consumption growth in India includes extensive rural electrification efforts through initiatives such as Saubhagya and the Deen Dayal Upadhyaya Gram Jyoti Yojana, which have provided electricity access to millions of rural households. Additionally, the expansion of industries, particularly in manufacturing, cement, steel, and textiles, has significantly fuelled industrial demand. The rapid pace of urbanization, along with increasing appliance ownership and evolving consumption patterns, has further driven higher electricity usage in residential sectors.

Despite these advancements, India's per capita electricity consumption remains considerably lower than that of many developed nations, largely due to its vast population and diverse socio-economic conditions.

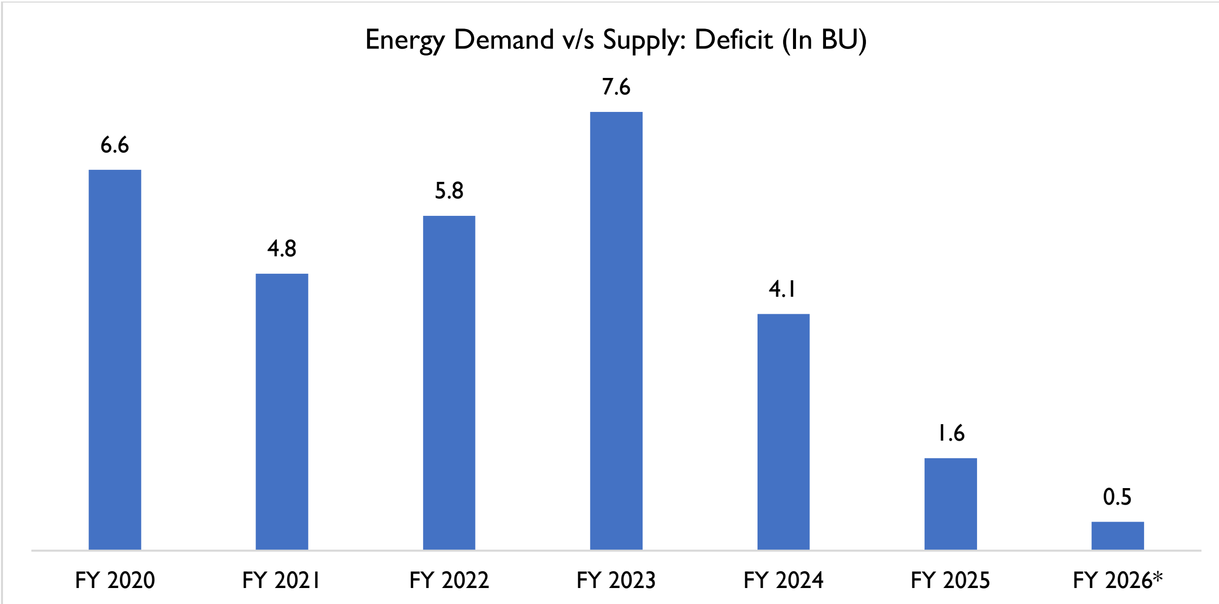
Electricity demand v/s supply scenario in India

India's electricity demand has grown steadily over recent years, reflecting increased industrial activity, urbanization, and rural electrification. Between FY 2020 and FY 2025, the total energy requirement rose from 1,291 BU to 1,694 BU, registering a Compound Annual Growth Rate (CAGR) of 5.6% on the back of strong economic growth, expanding infrastructure, and higher consumption across residential and industrial segments. This consistent rise highlights the expanding energy needs of the country's growing economy. In parallel, electricity supply has kept pace, improving significantly in both volume and reliability. For instance, while the supply in FY 2020 was 1,284.4 BU, it increased to 1,692.4 BU by FY 2025, resulting in a sharp decline in the power deficit from 6.6 BU to just 1.6 BU over the same period. Till FY 2026 December, the energy requirement stood at 1,286 BU, energy supplied at 1,285.5 BU, and the power deficit further narrowed to 0.5 BU.



Source: Central Electricity Authority, Ministry of Power,

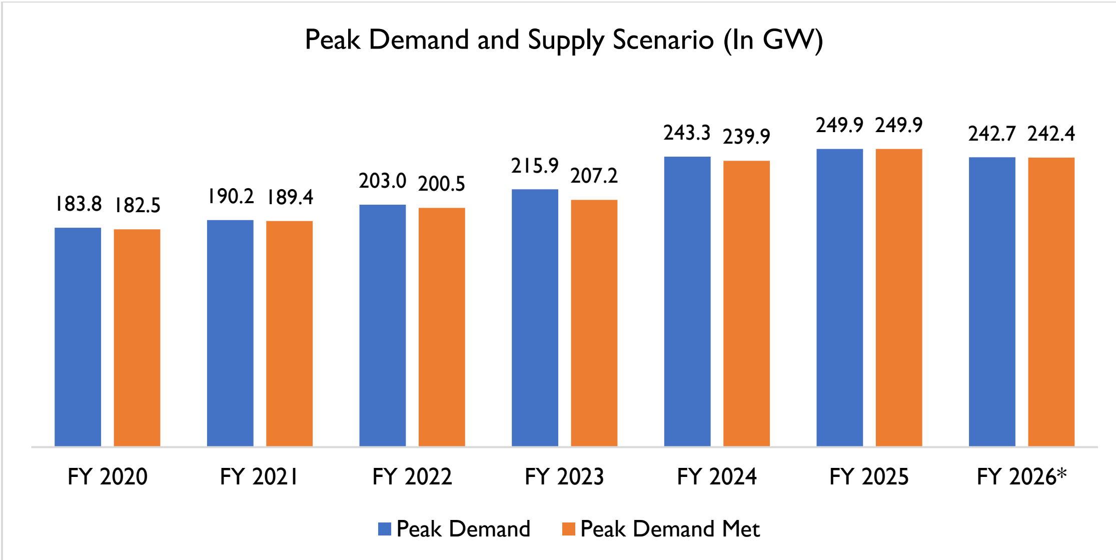
*Note: For FY 2026, the figures are up to December 2025



Source: Central Electricity Authority, Ministry of Power
*Note: For FY 2026, the figures are up to December 2025

The narrowing gap between demand and supply over these years indicates improvements in generation capacity, grid infrastructure, and operational efficiency. Even as demand surged year after year, the shortfall remained marginal and continued to shrink. Notably, in **FY 2026 (up to May)**, the deficit stood at just **0.1 BU**, pointing to a near-balanced power scenario. This performance underscores India's progress toward achieving energy adequacy, ensuring uninterrupted supply, and reducing regional and seasonal shortages. It reflects the success of sustained investments in power generation, particularly in renewables, along with better demand forecasting and grid management.

India's peak electricity demand has seen a steady upward trajectory in recent years, driven by rising consumption across residential, industrial, and commercial sectors. From 183.8 GW in FY 2020, the country's peak demand increased to 249.9 GW in FY 2025, reflecting a CAGR of 6.3% over the five-year period. This robust growth mirrors the country's broader economic expansion, increased electrification, and higher appliance and cooling loads, especially during summer months.



Source: Central Electricity Authority, Ministry of Power
*Note: For FY 2026, the figures are up to December 2025

Alongside rising demand, the country has significantly improved its ability to meet peak load requirements. While in earlier years there were minor gaps, such as a shortfall of 1.3 GW in FY 2020 and 8.7 GW in FY 2023, India achieved full demand met in FY 2025, with supply matching peak demand at 249.9 GW. This milestone highlights improvements in power system reliability, better grid resilience, and enhanced coordination between generation and transmission infrastructure.

For FY 2026, provisional figures up to December 2025 indicate a peak demand of 242.7 GW, with a marginal shortfall of 0.3 GW. While these values may increase as the year progresses, especially during peak summer, early data suggests continued strength in India's ability to handle peak load situations. Overall, the trend points to a power sector that is becoming more responsive and resilient, capable of keeping pace with rising demand while maintaining grid stability and supply adequacy.

As per National Electricity Plan published in October, 2024 by CEA, Peak Electricity Demand is expected to increase to 93,126 MW and 101,054 MW in Western and Northern Region for 2026-2027. The following table forecasts Peak Electricity Demand for Western and Northern Region on State-wise basis:

Northern Region	Peak Electricity Demand 2026-2027 (MW)
Chandigarh	492
Delhi	9,460
Haryana	16,337
Himachal Pradesh	2,571
Jammu & Kashmir	3,566
Ladakh	85
Punjab	17,698
Rajasthan	23,383
Uttar Pradesh	36,499
Uttarakhand	3,122

Northern Region	Peak Electricity Demand 2026-2027 (MW)
Total (Northern Region)	**101,054**

Source: National Electricity Plan, October, 2024

Western Region	Peak Electricity Demand 2026-2027 (MW)
Chhattisgarh	7,661
DNH & DD	1,766
Goa	901
Gujarat	30,873
Madhya Pradesh	22,400
Maharashtra	36,775
Total (Western Region)	**93,126**

Source: National Electricity Plan, October, 2024

Transmission & Distribution (T&D) Scenario

Based on the projected increase in electrical energy requirements and peak electricity demand in India, there is a clear need for substantial growth in power transmission and distribution infrastructure. The country's projected energy demand is expected to grow to 1,907 billion units (BU) in FY 2027 and 2,473 BU in FY 2032 and the expected increase in peak electricity demand from 216 gigawatts (GW) in FY 2023 to 277 GW in FY 2027 and 366 GW in FY 2032. To meet the rising demand, significant investments and advancements in the power sector are being made. It is expected that the transmission and distribution infrastructure will experience a substantial expansion to accommodate the growing electricity requirements.

The power transmission and distribution network will need to be strengthened and expanded with significant augmentation of the distribution infrastructure. This will involve the construction of new transmission lines, substations, and transformers, as well as upgrades to existing distribution networks to enhance the capacity and efficiency of the grid. Additionally, the deployment of advanced technologies such as smart grids and grid automation will be necessary to ensure optimal power flow and monitoring.

Furthermore, the expected increase in additional capacity requirement will also require the installation of new transformers, distribution lines, and metering systems to handle the higher loads and ensure reliable power supply to consumers. Thus, growth in power transmission and distribution infrastructure in India is essential to meet the steadily increasing demand for electricity. The expansion of these networks will enable the efficient and reliable supply of power, supporting the nation's economic growth, industrial development, and achieving all power and energy goals.

Review of Transmission System augmentation during the period 2017-22

1,04,400 ckm of transmission lines and 3,27,889 MVA of transformation capacity in sub-stations at 220 kV and above voltage levels were planned to be added during the period 2017-22. Against this target, 88,865 ckm (85 % of the target) of transmission lines and 349,685 MVA transformation capacity (107 % of the target) has been added during 2017-22. In addition, 14,000 MW of HVDC bi-pole capacity as planned has also been added during 2017-22 as detailed below:

Transmission System Type	Voltage Class	Unit	Target for 2017-22	Achievement during 2017-22	Achievement wrt Target
Transmission Lines	HVDC	CKM	3,531	3,819	108.16%
	765 kV	CKM	25,670	19,783	77.07%
	400 kV	CKM	36,770	36,191	98.43%
	230/220 kV	CKM	38,429	29,072	75.65%
Total-Transmission Lines		**CKM**	**1,04,400**	**88,865**	**85.12%**
Sub-Stations-AC	765 kV	MVA	1,16,700	89,700	76.86%
	400 kV	MVA	1,25,535	1,52,306	121.33%
	230/220 kV	MVA	85,654	1,07,679	125.71%
Total AC Sub-stations		**MVA**	**3,27,889**	**3,49,685**	**106.65%**
HVDC	Bi-pole/Monopole	MW	14,000	14,000	100.00%
	Back-to-back capacity	MW	0	0	-
Total-HVDC		**MW**	**14,000**	**14,000**	**100.00%**

Source: National Electricity Plan, October, 2024

At the end of 2021-22 (31.03.2022), the length of transmission lines and transformation capacity in sub-stations (220 kV and above voltage level) were 4,56,716 ckm and 10,70,950 MVA, respectively. The HVDC bi-pole capacity, including back-to-back capacity, was 33,500 MW. There has been an increase in the transmission system at higher voltage levels (400 kV and 765 kV levels). This aspect of growth in transmission systems highlights the requirement of transmission networks to carry bulk power over longer distances and at the same time optimize right of way, minimize losses and improve grid reliability.

Brief overview of T&D network in India

The transmission and distribution (T&D) system is the backbone of India's power sector, ensuring reliable and continuous delivery of electricity from generating stations to end-users. The transmission segment plays a critical role in evacuating power from generation plants and supplying it seamlessly to distribution entities across the country. To keep pace with the growing generation capacity, transmission infrastructure requires regular augmentation, enabling smooth flow of electricity and minimising bottlenecks.

A modern T&D system comprises transmission lines, substations, switching stations, transformers, and distribution lines, which are integrated into a national grid structure. This grid interlinks multiple generating stations and load centres, ensuring uninterrupted supply even during local generation failures or scheduled maintenance. Power can also be rerouted through alternative lines to prevent outages.

In India, the T&D framework operates in a three-tiered structure distribution networks, state grids, and regional grids. While state transmission utilities and electricity departments oversee intra-state systems, most inter-state and inter-regional transmission links are owned and operated by Power Grid Corporation of India Limited (PGCIL). These regional interconnections help balance surpluses and deficits across states and facilitate optimal power scheduling.

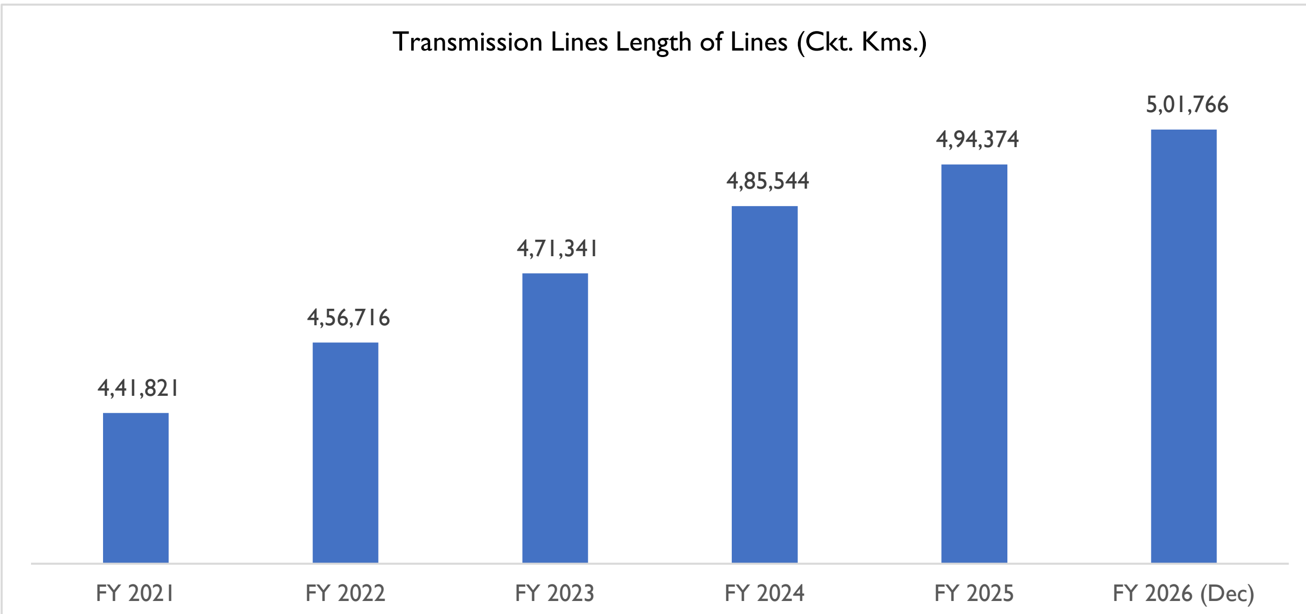
Voltage levels in the system are classified as:

- **Extra High Voltage (EHV):** 765 kV, 400 kV, 220 kV
- **High Voltage (HV):** 132 kV, 66 kV
- **Medium Voltage (MV):** 33 kV, 11 kV, 6.6 kV, 3.3 kV
- **Low Voltage (LV):** 1.1 kV, 220 volts and below

Currently, India's power grid is divided into five regional grids (Northern, Eastern, Western, Southern, and North-Eastern), which are interconnected to form a unified national grid. This allows surplus power in one region to be transferred to deficit areas, while also ensuring efficient outage management and coordinated plant operations.

The transmission and distribution (T&D) network forms the backbone of India's power sector, facilitating the reliable transfer of electricity from generation plants to distribution entities across the country. The transmission segment is crucial for ensuring seamless evacuation of power and requires continuous expansion to match the pace of generation capacity addition. A T&D system typically consists of transmission lines, substations, switching stations, transformers, and distribution lines, all of which are interconnected into a grid structure that enables uninterrupted power flow. This grid ensures that in case of a failure or maintenance shutdown at a local generating station, supply can still be maintained through alternative routes.

In India, the T&D system is organised into a three-tier framework comprising distribution networks, state grids, and regional grids, with most inter-state and inter-regional links being operated by Power Grid Corporation of India Limited (PGCIL). The system operates at multiple voltage levels ranging from extra high voltage (765 kV, 400 kV, 220 kV) to high, medium, and low voltages, ensuring power reaches end consumers through a structured hierarchy. Regional grids, covering the Northern, Eastern, Western, Southern, and North-Eastern states, are interconnected into a national grid, allowing power to be transferred from surplus to deficit areas and enabling coordinated outage management.



Source: Central Electricity Authority

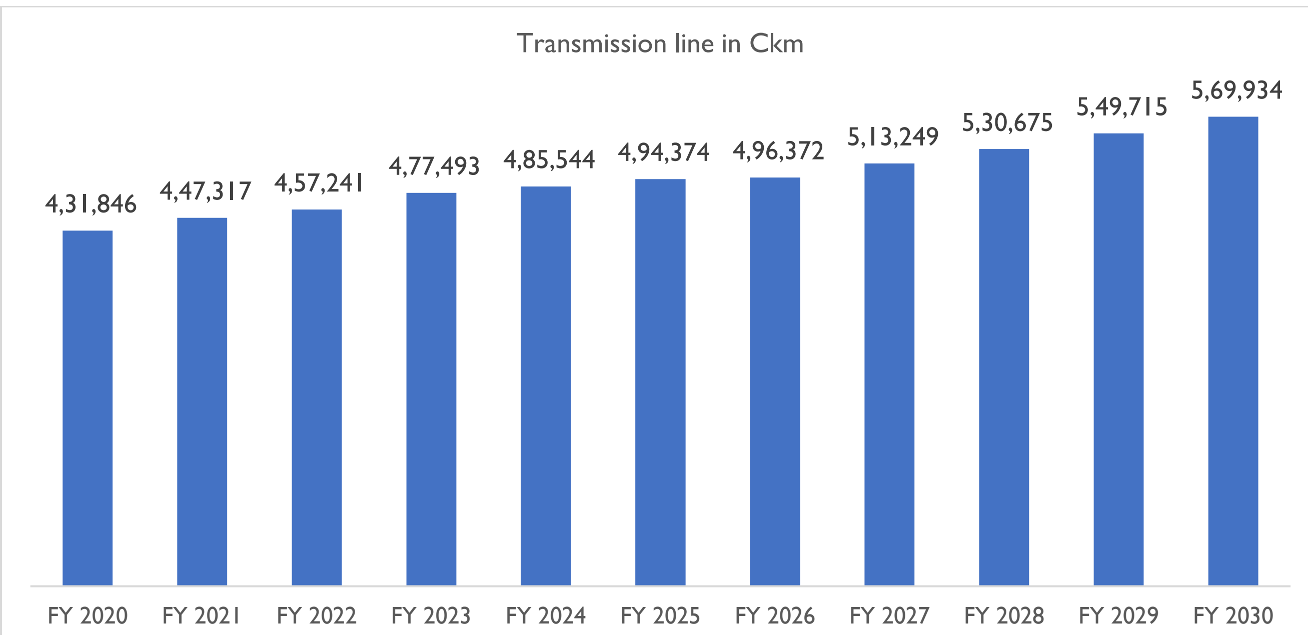
India's transmission network has expanded steadily over recent years, reflecting continuous strengthening of grid infrastructure to support rising electricity demand and the integration of renewable energy. The total length of transmission lines increased from 4,41,821 circuit kilometres in FY 2021 to 4,56,716 circuit kilometres in FY 2022, followed by a further rise to 4,71,341 circuit kilometres in FY 2023. This consistent expansion highlights sustained investments in transmission capacity to enhance grid connectivity and reliability across regions.

The growth momentum continued in subsequent years, with transmission line length reaching 4,85,544 circuit kilometres in FY 2024 and increasing further to 4,94,374 circuit kilometres in FY 2025. As of January, FY 2026, the total transmission network expanded to 5,01,766 circuit kilometres, indicating ongoing infrastructure additions. The steady increase in transmission line length underscores India's commitment to strengthening its power transmission framework to facilitate efficient power evacuation, improve grid resilience, and support the country's evolving energy mix.

Insight on standard voltage level and its applications

➢ **Extra High Voltage (EHV):** (220 kV & above)

India's transmission network has seen consistent capacity additions in recent years, underscoring the country's focus on building a resilient and reliable grid to meet growing electricity demand. Between FY 2020 and FY 2025, the total transmission line length expanded from 4,31,846.0 circuit kilometres to 4,94,374.0 circuit kilometres, registering a CAGR of 2.7%. This steady growth reflects ongoing investments in high-voltage and extra-high voltage corridors, expansion of interstate links, and the creation of evacuation infrastructure for large generation projects, particularly in renewable-rich states. The historic trend demonstrates the sector's ability to maintain incremental additions year on year while strengthening the backbone of the national grid.

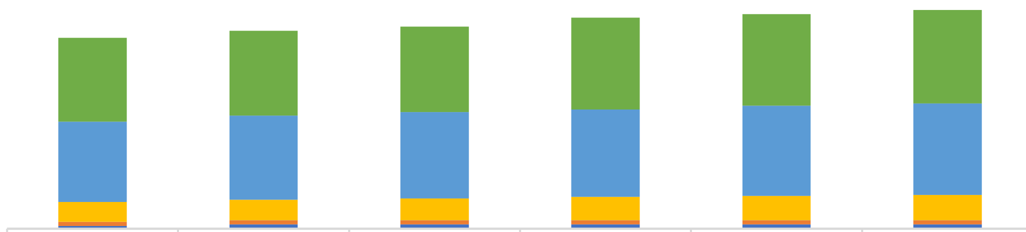


Source: Central Electricity Authority[4]

Looking ahead, the transmission network is projected to rise from 4,94,374.0 circuit kilometres in FY 2025 to 5,69,934.4 circuit kilometres by FY 2030, translating into a CAGR of 2.9% over this period. This indicates a continuation, and even a slight acceleration, of grid expansion, driven by the need to integrate large-scale renewable projects, ensure inter-regional balancing, and enhance cross-border flows. The projected addition of over 75,000 circuit kilometres in five years highlights India's commitment to building capacity not just for current demand but also for future resilience. Together, the historic growth and projected expansion underline the strategic importance of transmission infrastructure as the backbone of India's energy transition, ensuring reliable power delivery, reduced losses, and long-term energy security.

[4] As per the CEA's 2023 annual report, transmission line data is now primarily reported for voltage levels of 220 kV and above. Official statistics on line length and capacity additions are consistently published for 220 kV, 400 kV, 765 kV (AC), and HVDC, which together constitute the EHV segment.

Transmission Lines in (Ckt. kms.) by Extra High Voltages



	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
230/220 kV	1,89,836	1,91,365	1,93,762	2,07,776	207534	211252
400 kV	1,81,601	1,90,426	1,95,318	1,97,726	203838	206792
765kV	44,851	46,108	48,743	52,573	54797	56955
± 320 KV HVDC	-	330	330	330	288	288
±500 kV HVDC	9,432	9,432	9,432	9,432	9432	9432
±800 kV HVDC	6,126	9,656	9,656	9,656	9655	9655

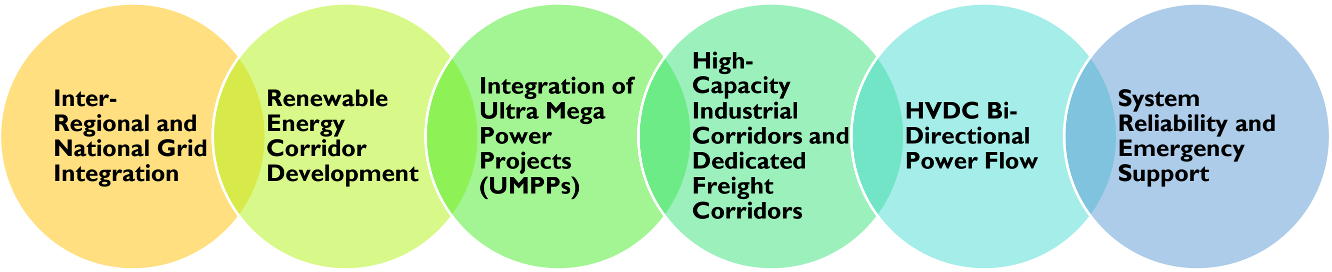
Source: Central Electricity Authority

Extra high voltage (EHV) lines, covering **220 kV, 400 kV, 765 kV, and HVDC corridors (±320 kV, ±500 kV, ±800 kV)**, form the backbone of India's national grid, enabling the transfer of bulk power across states and regions. Operating at these high levels ensures minimal transmission losses (I^2R losses) and supports long-distance delivery of electricity from generation centres, often located in remote areas, to major consumption hubs. EHV infrastructure is critical for grid reliability, renewable energy integration, and maintaining stability in India's synchronised national network.

As per Central Electricity Authority (CEA) data, India's EHV network has consistently expanded. At the **230/220 kV level**, line length rose from **1,89,836 circuit kilometres in FY 2020** to **2,11,252 circuit kilometres projected for FY 2025**. Similarly, **400 kV lines** increased from **1,81,601 circuit kilometres in FY 2020** to **2,06,792 circuit kilometres in FY 2025**. The **765 kV network**, representing India's thrust towards ultra-high voltage transmission, grew from **44,851 circuit kilometres in FY 2020** to **56,955 circuit kilometres in FY 2025**. On the HVDC front, **±500 kV lines** have remained steady at about **9,432 circuit kilometres**, while **±800 kV lines** stand at **9,655 circuit kilometres**. Meanwhile, **±320 kV HVDC** has been introduced in limited capacity, with around **288–330 circuit kilometres** operational since FY 2021.

This historic and projected expansion underscores the strategic importance of EHV transmission in enabling **inter-regional power transfers, renewable energy corridor development, and balancing power surpluses and deficits across states**. The scaling-up of 765 kV ultra-high voltage lines, along with HVDC corridors, is particularly significant for meeting India's growing electricity demand, enhancing energy security, and ensuring grid stability as renewable energy integration accelerates in the coming years.

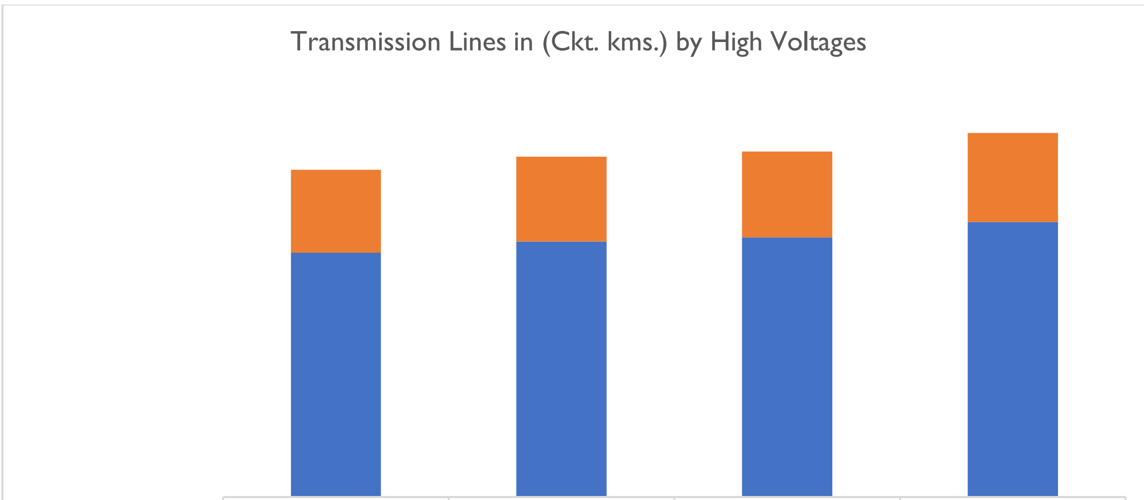
Extra High Voltage Application:



- **Inter-Regional and National Grid Integration:** EHV lines (220 kV, 400 kV, and 765 kV) act as the structural backbone of India's unified national grid. They enable real-time balancing between regional grids (Northern, Western, Eastern, Southern, and North-Eastern), ensuring smooth power flow across vast geographies. This allows the system to meet fluctuating demand in deficit regions by drawing on surplus generation elsewhere.
- **Renewable Energy Corridor Development:** Ultra-high voltage lines are increasingly being deployed under **Renewable Energy Corridors** to connect large solar and wind clusters in resource-rich states such as Rajasthan, Gujarat, Tamil Nadu, and Karnataka. EHV lines facilitate bulk evacuation of renewable power, ensuring it can be delivered to load centres hundreds of kilometres away without significant losses.
- **Integration of Ultra Mega Power Projects (UMPPs):** EHV infrastructure supports the evacuation of electricity generated by UMPPs and other large generating stations. By stepping up power directly to 400 kV or 765 kV, these projects achieve efficient long-distance transmission. Dedicated EHV lines link UMPPs to state and regional grids, helping meet base-load requirements.
- **High-Capacity Industrial Corridors and Dedicated Freight Corridors:** India's upcoming industrial belts and freight corridors demand uninterrupted, high-capacity power. EHV lines supply these strategic projects with stable electricity, supporting large-scale manufacturing, metro rail systems, and logistics infrastructure that cannot risk outages.
- **HVDC Bi-Directional Power Flow:** Alongside AC networks, **±500 kV and ±800 kV HVDC corridors** are deployed for secure and bi-directional long-distance transmission. These systems are used to connect hydro-dominated regions like the North-East to demand centres in Northern and Western India, improving flexibility and stability of the grid.

- **System Reliability and Emergency Support:** EHV lines provide redundancy during contingencies, allowing rerouting of power when lower-voltage transmission paths are overloaded or unavailable. This ensures grid stability during peak demand, plant outages, or maintenance shutdowns.

➢ **High Voltage (HV):**



	FY 2020	FY 2021	FY 2022	FY 2023
78/66 kV	71,285	72,987	73,868	76,669
132/110/90 kV	2,10,269	2,19,892	2,23,522	2,36,593

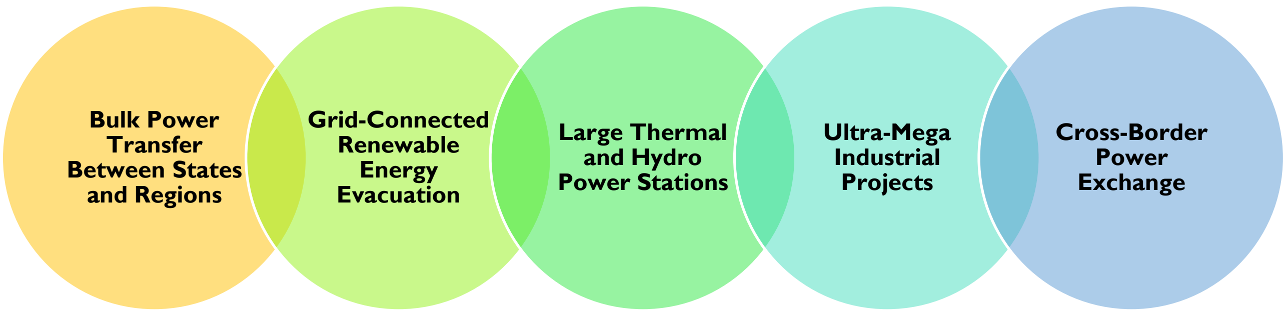
Source: Central Electricity Authority

High voltage transmission in India generally covers the 66 kV to 132 kV range, which acts as a critical link between extra-high voltage (EHV) backbones and medium-voltage sub-transmission networks. These lines are designed to transfer sizeable quantities of power over moderate distances, helping step down from bulk interstate transfers to state-level and regional demand centres. The 66 kV level typically functions as a transition point between sub-transmission and higher-voltage transmission, while 132 kV and its variants (110 kV, 90 kV) are more widely deployed across state grids for feeding distribution substations.

As per the Central Electricity Authority's records, the total length of HV transmission lines has steadily expanded over recent years. At the 132/110/90 kV level, line length rose from 2,10,269 circuit kilometres in FY 2020 to 2,36,593 circuit kilometres by FY 2023. Similarly, 66/78 kV lines increased from 71,285 circuit kilometres in FY 2020 to 76,669 circuit kilometres in FY 2023. This consistent addition underscores the importance of HV lines in strengthening intra-state transmission, balancing regional demand, and ensuring reliable connectivity between generating stations and urban/industrial load centres.

Unlike the extra-high voltage grid (220 kV and above), which focuses on bulk interstate transfer, the HV segment plays a bridge role within state and regional networks. By efficiently linking EHV systems with medium-voltage distribution, these lines enhance the resilience of the overall grid and support seamless last-mile integration.

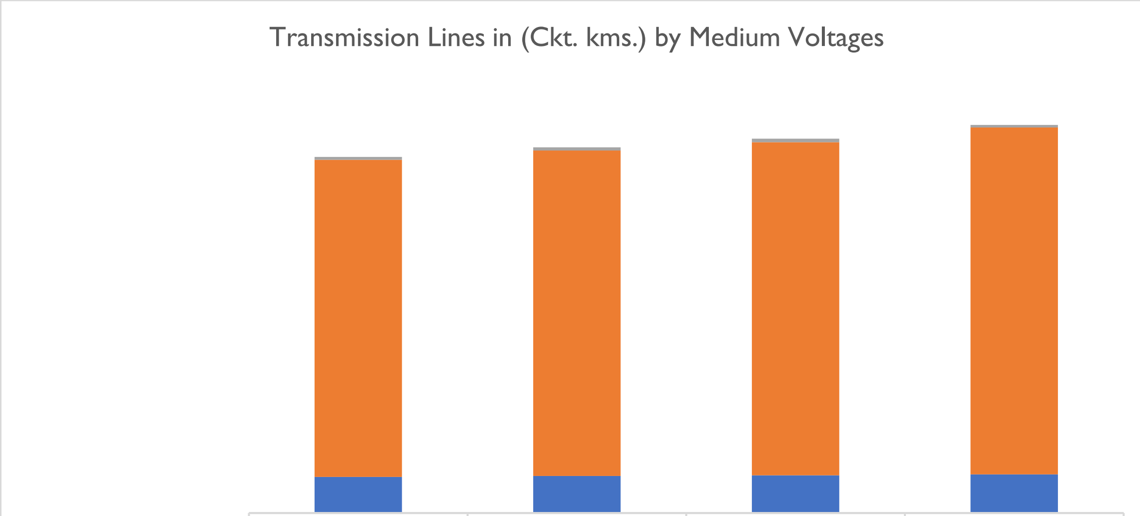
High Voltage Application:



- **Bulk Power Transfer Between States and Regions:** High-voltage transmission lines (132kV/220kV/400kV/765kV) are used to move electricity from surplus to deficit states or regions. This inter-regional connectivity enables better grid stability and avoids localized blackouts. The Power Grid Corporation of India operates this infrastructure, maintaining a synchronized national grid. HVDC corridors are also used for long-distance, point-to-point bulk transfer with minimal loss.
- **Grid-Connected Renewable Energy Evacuation:** Large-scale solar and wind parks are connected to 220kV or 400kV substations for evacuation to the grid. These parks are often located in remote areas (e.g., Rajasthan, Gujarat) and need extra high-voltage lines to transport power to demand centers. Green energy corridors have been set up to enable smooth integration of renewable power. These projects are supported by state transmission utilities and central funds.
- **Large Thermal and Hydro Power Stations:** Power generated at large thermal or hydroelectric stations is stepped up to 400kV or 765kV for transmission. These voltages reduce transmission losses and improve system efficiency over long distances. Generator transformers at the plant site handle the voltage transformation. The generated power is then injected into the transmission network managed by load dispatch centers.
- **Ultra-Mega Industrial Projects:** Projects like steel plants, refineries, and metro rail systems require massive energy inputs and thus receive supply at 132kV or 220kV. These projects install their own grid substations and step-down voltage internally. The reliability of supply at these voltages is crucial, and any interruptions can halt production or transport systems.

- **Cross-Border Power Exchange:** India exports and imports electricity to/from neighbouring countries like Nepal, Bhutan, and Bangladesh through 132kV and above interconnectors. These cross-border links are regulated by bilateral agreements and monitored by the Ministry of Power. HV infrastructure enables efficient international cooperation in energy markets.

➢ **Medium Voltage (MV):**



	FY 2020	FY 2021	FY 2022	FY 2023
6.6/4.4/3.3/2.2 kV	44,178	44,172	47,819	36,853
15/11 kV	44,52,730	45,72,823	46,80,074	48,71,967
33/22/20 kV	5,08,226	5,20,304	5,29,906	5,43,826

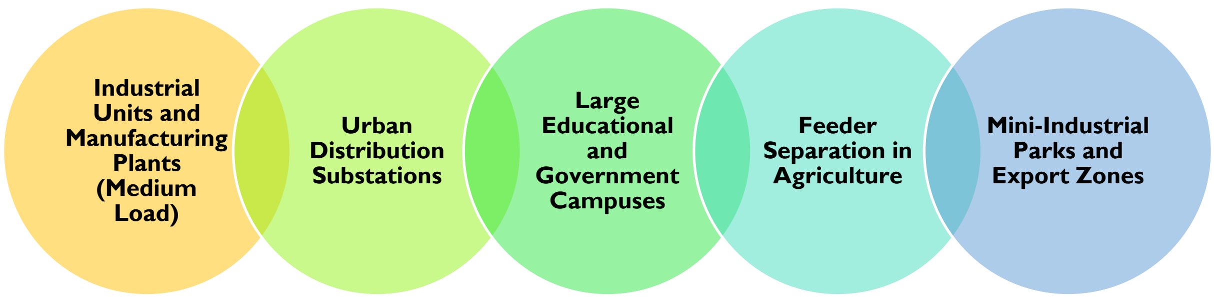
Source: Central Electricity Authority

Medium voltage networks form the critical sub-transmission and distribution backbone in India's power sector, bridging the gap between high-voltage transmission lines and low-voltage distribution delivered to end consumers. Typically operating in the range of 33 kV, 22 kV, 20 kV, 15 kV, 11 kV, and down to 6.6 kV / 4.4 kV / 3.3 kV / 2.2 kV, these systems step power down from state or regional grids and deliver it to city networks, industrial clusters, and semi-urban or rural areas. MV networks ensure voltage stability, efficient load management, and safe distribution across multiple consumer categories.

According to Central Electricity Authority data, India's MV transmission lines have demonstrated consistent expansion over recent years. At the 33/22/20 kV level, the line length increased from 5,08,226 circuit kilometres in FY 2020 to 5,43,826 circuit kilometres by FY 2023. Similarly, 15/11 kV networks, which form the largest component of MV infrastructure, expanded from 44,52,730 circuit kilometres in FY 2020 to 48,71,967 circuit kilometres in FY 2023. The lower MV category (6.6/4.4/3.3/2.2 kV) remained relatively small in comparison, fluctuating between 44,178 circuit kilometres in FY 2020 and 36,853 circuit kilometres in FY 2023.

This steady growth highlights the pivotal role of MV lines in strengthening last-mile connectivity and meeting India's growing demand for electricity in both urban and rural areas. By directly feeding industrial parks, commercial hubs, and agricultural demand centres, MV networks not only ensure efficient load distribution but also act as the foundation for rural electrification schemes and city-level grid resilience.

Medium Voltage Applications:



- **Industrial Units and Manufacturing Plants (Medium Load):** Industries such as textile mills, packaging units, and food processing facilities typically use 11kV or 33kV supply. They operate equipment like induction motors, compressors, and CNC machines that require significant electrical input. These consumers often install in-house transformers to step down voltage to usable levels. They are billed under industrial tariffs with demand-based charges.
- **Urban Distribution Substations:** Urban localities are supplied via 11kV or 33kV feeders that step down to low voltage at pole-mounted or ground-mounted transformers. These substations serve a cluster of households, offices, or apartment complexes. They form the primary backbone of the urban electricity distribution network. Utility engineers can remotely control breakers and isolators at these substations for load management.
- **Large Educational and Government Campuses:** Universities, railway stations, airports, and administrative offices often require 11kV or 33kV connections due to the scale of operations. Centralized distribution and energy monitoring help manage multiple buildings from a single control point. Energy usage in such facilities spans HVAC systems, lifts, IT infrastructure, and heavy lighting.
- **Feeder Separation in Agriculture:** Under schemes like Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY), agricultural and non-agricultural loads are separated using 11kV feeders. This prevents

overloading of rural grids during peak irrigation hours and ensures better voltage regulation for domestic users. These dedicated feeders also help in time-controlled supply and reducing AT&C losses.

- **Mini-Industrial Parks and Export Zones:** Export processing zones and mini-industrial estates are supplied with 33kV power to ensure quality and uninterrupted supply. These zones may be developed under state industrial infrastructure schemes. Each industrial unit has its metered connection, but the bulk supply is received at a single switchyard.

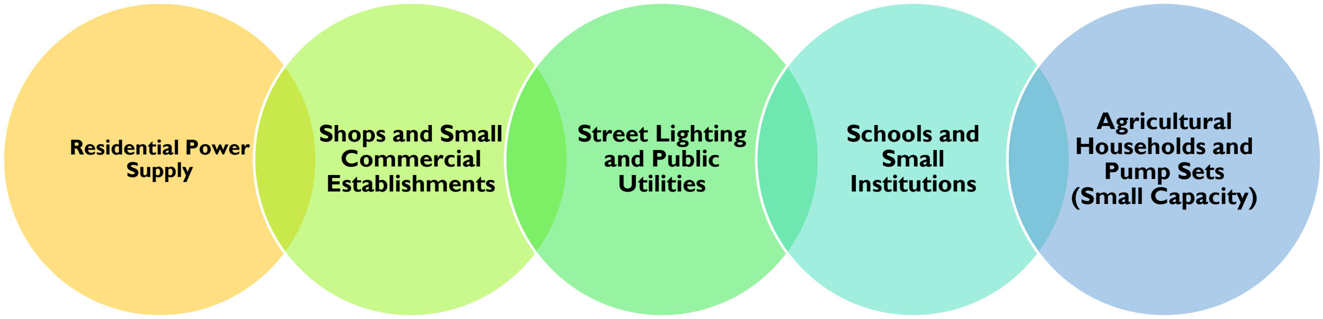
- **Low Voltage (220 volts and below):**

In India, 230 volts (single-phase) and 400 volts (three-phase) are the standard low-voltage levels supplied to end-users. This tier of the network caters primarily to residential households, small commercial establishments, and light industrial consumers. Electricity at this level is delivered through local distribution transformers, which step down power from medium-voltage systems such as 11 kV. The 230V/400V supply ensures compatibility with household appliances, lighting systems, office equipment, and small machinery, forming the final stage in the electricity delivery chain where safety, reliability, and voltage stability are paramount.

Regulations issued by the Central Electricity Authority (CEA) and respective state electricity regulatory commissions mandate that supply to individual consumers must not exceed 230V for single-phase or 400V for three-phase connections under normal conditions. These levels are enforced under supply codes such as the MSERC Electricity Supply Code, 2011, which ensures voltage consistency and protection for consumer equipment. At the operational level, distribution transformers typically step-down power from 11 kV to 400V, serving clusters of households or small facilities across both urban and rural areas.

Although low-voltage lines represent a smaller share of total transmission in terms of circuit kilometres, they form the most widespread and consumer-facing portion of the grid. India's distribution network below 66 kV spans over 14 million circuit kilometres, with a significant proportion attributed to this low-voltage tier. This segment is critical for last-mile connectivity, acting as the interface between utilities and end consumers, and directly shaping the quality and reliability of power supply experienced by millions of users across the country.

Low Voltage Applications:



- **Residential Power Supply**: Low voltage is the standard for powering homes across India. It supports lighting, fans, televisions, refrigerators, washing machines, and other household appliances. This voltage is safe for end-users and easy to control using domestic wiring and circuit breakers. Distribution transformers in neighborhoods step down power from 11kV to 400V to supply multiple homes. Electricity boards ensure voltage regulation to prevent fluctuations that can damage appliances.
- **Shops and Small Commercial Establishments:** Small retail shops, salons, clinics, and local offices use 400V three-phase or 230V single-phase supply depending on their load. They run basic electrical equipment such as point-of-sale systems, air conditioners, coolers, lights, and freezers. These setups are designed for moderate power needs and do not require in-house transformers. Supply is typically metered by the local discom, with tariffs based on consumer category.
- **Street Lighting and Public Utilities:** Street lighting systems, traffic signals, and small water pumps operate on 230V/400V networks. Municipal corporations are major users in this segment. Timers, control panels, and automatic switching mechanisms are integrated into low-voltage systems. These setups allow for easy maintenance and flexibility in controlling specific zones. Since safety is critical, protective devices like earth leakage circuit breakers are commonly installed.
- **Schools and Small Institutions**: Educational institutions like primary schools and tuition centers use low voltage for lighting, computing, and fans. Labs and small server rooms can also be supported with this supply. These institutions are often part of dedicated low-voltage feeders in urban or rural localities. In rural areas, these are connected via pole-mounted transformers that supply a group of buildings.
- **Agricultural Households and Pump Sets (Small Capacity):** Small farmers use 230V or single-phase 400V supply for low-power agricultural applications like domestic water pumps or drip irrigation systems. Though large agricultural pumps use higher voltage (11kV), households with limited land or water requirements can manage with this tier. Electricity boards may offer subsidized tariffs in this segment to support rural livelihoods.

Insight on regional grids in India

India's electricity transmission system is broadly organized into five regional grids Northern, Eastern, Western, Southern, and North-Eastern each originally developed for planning and operational purposes. These regional grids were interconnected over time: the Eastern and North-Eastern grids in 1991, the Western grid in 2003, and the Northern grid in 2006, culminating with the Southern grid's synchronization in December 2013 via the 765 kV Raichur- Solapur line. With this final integration, India achieved the "One Nation, One Grid, One Frequency" model, unifying all regional grids under a single 50 Hz frequency regime.

The National Grid, now managed by Power Grid Corporation of India (PGCIL) under the Ministry of Power, ensures frequency stability and inter-regional power exchange across the country. Operational control is exercised through Grid India (formerly POSOCO), which runs the National Load Dispatch Centre (NLDC), five Regional Load Dispatch Centres (RLDCs), and multiple State Load Dispatch Centres (SLDCs). These centers coordinate electricity scheduling, manage inter-state transmission, and integrate renewable energy sources at a national scale.

Each regional grid comprises a diverse energy resource mix: for example, the Northern and Western regions have substantial coal, hydro, and nuclear capacity, while the Southern and Western regions lead in wind and solar installations. Over time, renewable energy zones in these regions have become critical sourcing points, necessitating robust transmission links to share clean energy surplus across grids. The interconnected grid model facilitates optimal resource use and supports India's ambition to channel power from resource-rich to load-centric regions.

The unified grid has also positioned India as the largest synchronous grid in the world, with an installed generation capacity exceeding 480 GW as of mid-2025. Despite geographic exclusions such as the Andaman & Nicobar and Lakshadweep islands, this integrated setup enables reliable electricity trade between regions, interstate power trading, and enhanced grid resilience. Cross-border interconnections with Bhutan, Nepal, Bangladesh, and Myanmar further augment regional energy security under this national-level architecture.

Growth of Transmission System in India, 2019-20 to 2023-25

AS on Year ending on 31st March	Transmission Lines (AC+HVDC) (ckm) (220KV and above) (MVA)	Transformation Capacity of Substations (220KV and above) (MVA)
FY 2020	425,071	967,893
FY 2021	441,821	1,025,468
FY 2022	456,716	1,104,450
FY 2023	471,341	1,180,352
FY 2024	485,544	1,251,080
FY 2025	494,374	1,337, 513

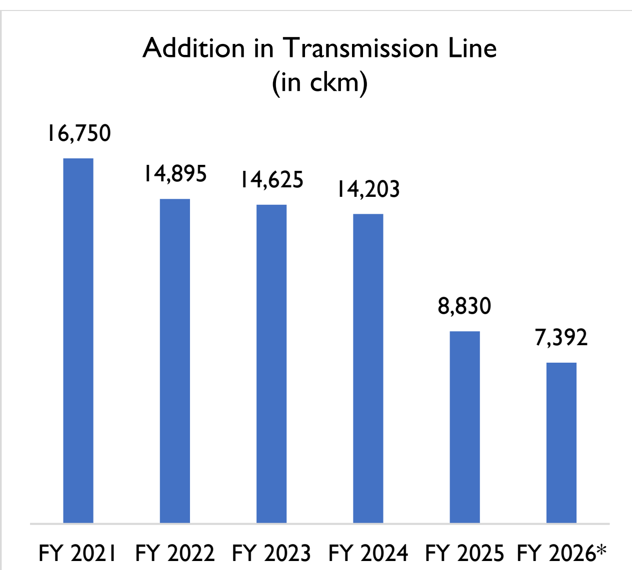
Source: Central Electricity Authority

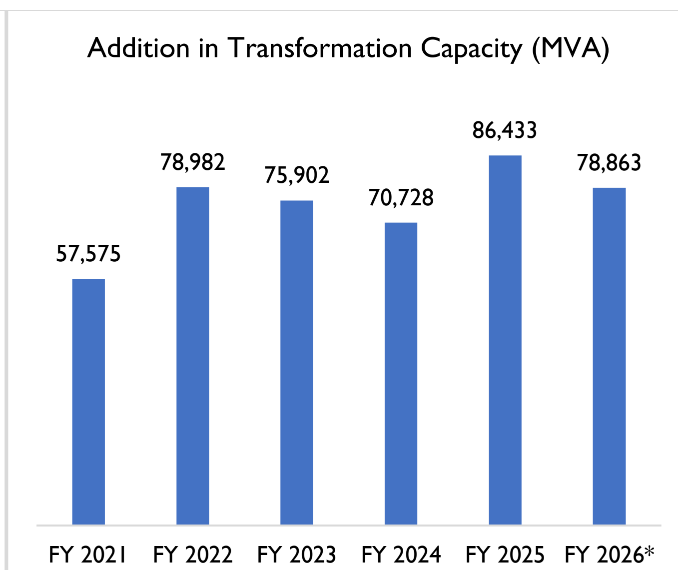
In recent years, India has made substantial progress in expanding this network. Between FY 2020-25, India's power transmission infrastructure witnessed steady growth, both in terms of transmission lines and the transformation capacity of substations. The total length of transmission lines (AC+HVDC) increased from 425,071 ckm in FY 2020 to 490,374 ckm in FY 2025, reflecting an overall CAGR of approximately 3.1%. This expansion signifies continuous efforts to improve electricity transmission across the country, ensuring better connectivity and efficiency in power distribution.

Simultaneously, the transformation capacity of substations (220KV and above) saw a substantial increase from 967,893 MVA in FY 2020 to 1,337,513 MVA in FY 2025, marking a notable growth of around 6.7%. This rise indicates significant investments in substation infrastructure to support higher power loads, enhance grid stability, and facilitate the integration of renewable energy sources. The consistent expansion of both parameters highlights India's commitment to strengthening its transmission network, meeting rising electricity demand, and ensuring a more resilient and efficient power supply system.

Annual Addition Trend

In , FY 2026 till January, the country added 7,392 CKM (“**Circuit Kilometres**”) of transmission lines and increased transformation capacity by 78,863 MVA. Over the past five years, India maintained an average annual addition of 13,860.6 ckm of transmission lines and 73,924 MVA of transformation capacity.





Source: Central Electricity Authority, Ministry of Power*FY 2026- As of January 2026

The bar chart illustrates the annual addition of transmission lines (in circuit kilometres, ckm) in India from FY 2020 to FY 2026 till January. The data shows a peak in FY 2021 with 16,750 ckm added, reflecting a significant infrastructure push possibly aligned with early post-COVID recovery and renewable integration efforts. This was followed by a relatively stable period from FY 2022 to FY 2024, with annual additions hovering between 14,200 and 14,900 ckm. However, FY 2025 saw a sharp decline to 8,830 ckm, marking the lowest capacity addition in the six years. Till January 2026, the capacity addition for the transmission line stood at 7,392 ckm and the capacity addition at 78,863. This downturn may be attributed to project delays, funding constraints, or a temporary saturation in capacity build-up after earlier acceleration phases. Overall, the trend reflects a cyclical investment approach with a recent slowdown warranting policy or execution-level attention.

Perspective Transmission Plan for the period 2027-32

Considering the planned generation capacity addition and projected electricity demand, about 76,787 ckm of transmission lines and 4,97,855 MVA of transformation capacity in the substations (220 kV and above voltage level) are planned to be added during the period 2027-32. In addition, 32,250 MW of HVDC bi-pole capacity is also planned to be added during 2027-32. With the planned addition, the length of transmission lines and transformation capacity in sub-stations (220 kV and above voltage level) would become 6,48,190 ckm and 23,45,135 MVA respectively. The HVDC bi-pole capacity including back-to-back capacity would increase to 66,750 MW by 2031-32. Details are given below:

Transmission System Type	Voltage Class	Unit	At the end of 2021-22	Likely addition during 2022-27	Likely at the end of 2026-27	Likely addition during 2027-32	Likely at the end of 2031-32
Transmission lines	HVDC	CKM	19,375	80	19,455	15,432	34,887
	765 kV	CKM	51,023	36,558	87,581	27,138	1,14,719
	400 kV	CKM	1,93,978	34,618	2,28,596	20,989	2,49,585
	230/220 kV	CKM	1,92,340	43,431	2,35,771	13,228	2,48,999
Total Transmission Lines		**CKM**	**4,56,716**	**1,14,687**	**5,71,403**	**76,787**	**6,48,190**
Sub-stations	765 kV	MVA	2,57,200	3,43,500	6,00,700	3,19,500	9,20,200
	400 kV	MVA	3,93,113	2,84,970	6,78,083	1,35,745	8,13,828
	230/220 kV	MVA	4,20,637	1,47,860	5,68,497	42,610	6,11,107
Total Substations		**MVA**	**10,70,950**	**7,76,330**	**18,47,280**	**4,97,855**	**23,45,135**
HVDC	Bi-pole link	MW	30,500	1,000	31,500	32,250	63,750
	Back-to-back	MW	3,000	0	3,000	0	3,000
Total HVDC		**MW**	**33,500**	**1,000**	**34,500**	**32,250**	**66,750**

Source: National Electricity Plan, October, 2024

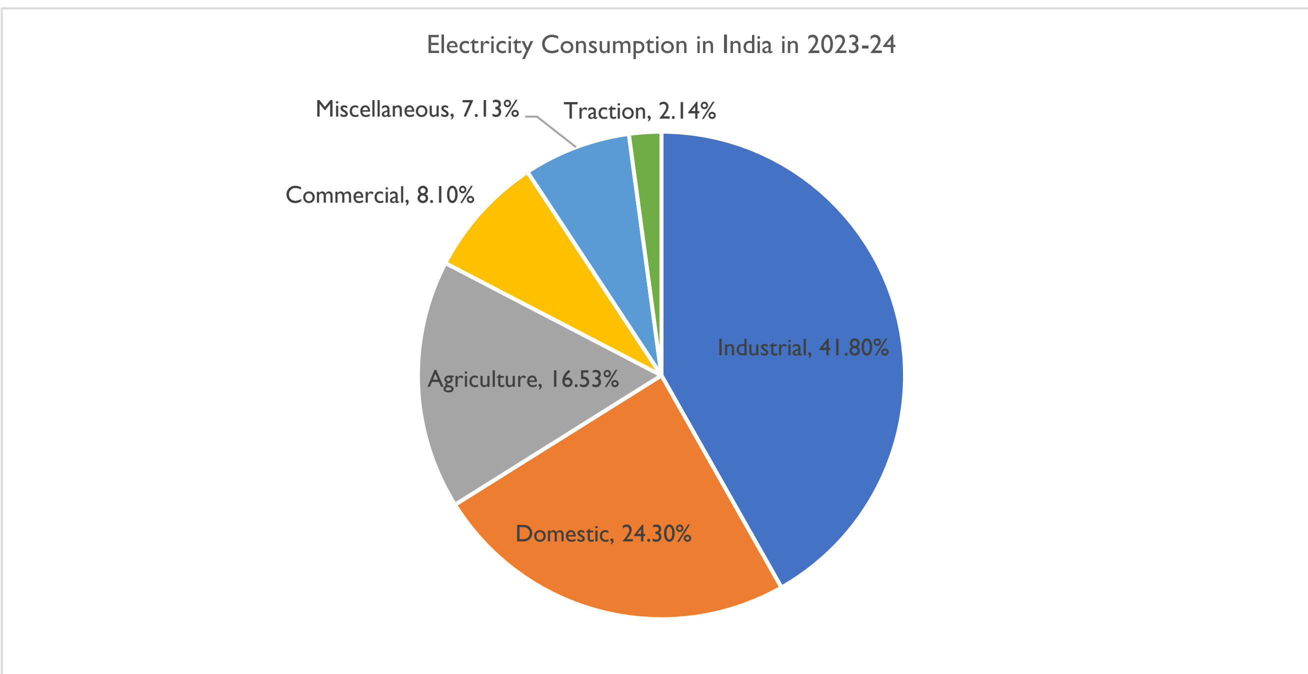
Distribution:

Distribution is the final stage in the electricity supply chain and plays a crucial role in the overall efficiency of the sector. Majority of the distribution segment is owned and managed by State Electricity Distribution Companies (DISCOMs) and State Electricity Boards (SEBs).

Growth of Electricity Consumption in India (Consumer category-wise) (BU), 2019-20 to 2023-24

Year	Domestic	Commercial	Industrial	Agriculture	Traction	Misc.	Total
FY 2020	308.75	106.05	532.82	211.30	19.15	70.03	1248.09
FY 2021	330.81	86.95	508.78	221.30	14.67	67.70	1230.21
FY 2022	339.78	97.12	556.48	228.45	21.94	73.00	1316.76
FY 2023	353.16	117.23	593.90	243.85	30.03	102.15	1440.31
FY 2024*	375.00	125.00	645.00	255.00	33.00	110.00	1543.00

Note: * = Provisional.



Source: Central Electricity Authority

India's electricity consumption has shown a steady increase across all consumer categories between FY 2020 - 24. Domestic consumption rose from 308.75 BU in FY 2020 to 375.00 BU in FY 2024, indicating a growing demand for household electricity due to urbanization and rising appliance usage. The commercial sector exhibited fluctuations, dropping to 86.95 BU in FY 2021 due to the pandemic but rebounding to 125.00 BU in FY 2024.

Industrial electricity consumption, a key driver of economic activity, saw a dip in FY 2021 but recovered significantly, reaching 645.00 BU in in FY 2024. The agricultural sector also saw consistent growth, with consumption increasing from 211.30 BU to 255.00 BU, highlighting the expanding demand for irrigation and farming operations. Traction and miscellaneous categories followed a similar upward trend, reflecting increased electrification in railway operations and other sectors. Overall, total electricity consumption grew from 1248.09 BU in 2019-20 to 1543.00 BU in 2023-24, underscoring India's increasing energy needs driven by economic expansion and infrastructure development.

Transmission Sector in the State of Gujarat

Gujarat is one of the leading states in Transmission Infrastructure with addition of 3,428 CKM of transmission lines and 108 substations during 2023-2024. GETCO has been notified as State Transmission Utility (STU) by Government of Gujarat vide Notification No.GHU-04-31-GEB-1104-2946-K Dated 29th May 2004 with the purpose of improving efficiency in the state's electricity transmission activities.

As per the Network Planning Report of GETCO, March -2024, Power Infrastructure of Gujarat consists of 76,482 CKM of Transmission line and 2,311 numbers of substations, having total transformation capacity of 1,70,537 MVA. Following data provides additions made during the 2023-2024, in the Power Infrastructure of State of Gujarat.

Voltage Class	As on 31.03.2023		Additions during the year 2023-2024		As on March 31.03.2024	
	Substation (Nos.)	Transmission Lines (ckm)	Substation (Nos.)	Transmission Lines (ckm)	Substation (Nos.)	Transmission Lines (ckm)
400 kV	18	6722	0	847	18	7569
220 kV	113	21820	5	432	118	22252
132 kV	52	5833	0	114	52	5947
66kV and 33kV	2020	38679	103	2035	2123	40714
Total	2203	73054	108	3428	2311	76482

Source: Network Planning Report, GETCO, March, 2024

Substations Planned upto year 2028-29:

Voltage Class	As on 31.03.2024	Year					Total Planned (2024-29)
		2024-25	2025-26	2026-27	2027-28	2028-29	
765 kV	-	-	-	1	3	-	4
400 kV	18	1	1	3	3	-	8
220 kV	118	8	14	28	8	6	64
132 kV	52	1	2	1	1	-	5
66 kV	2123	85	85	85	85	85	425
Total	**2311**	**95**	**102**	**118**	**100**	**91**	**506**

Source: Network Planning Report, GETCO, March, 2024

Year wise Transformation Capacity (in MVA) to be added up to year 2028-29:

Voltage Class	Year					Total Planned (2024-29)
	2024-25	2025-26	2026-27	2027-28	2028-29	
765 kV	-	-	3000	90000	-	12000
400 kV	1000	1000	3000	3000	-	8000
220 kV	2560	4480	8960	2560	1920	20480
132 kV	200	400	200	-	-	800
66 kV	2550	2550	2550	2550	2550	12750
Total	**6310**	**8430**	**17710**	**17710**	**4470**	**54030**

Source: Network Planning Report, GETCO, March, 2024

Item	Quantity		Name of S/S
765 kV Substation	1 No.		Ghela Somnath (Saurashtra), Saykha, Radhanesda (PS), Kutch (PS-1)
400 kV Substation	8 Nos.	8	Achhalia, Babarzar, Kalavad, Keshod, Pipavav, Prantij, Saykha, Shivlakha
220 kV Substation	64 Nos.	51	**New substation:** Avaniya, Babarzar, Bagasara, Balethi, Bhalgamda, Bhesan, Bhuteshwar, Chalala, Chikada, Dadusar, Dhama, Dharampur, Dhank, Dholera, Dumas, Gondal.
			II (Gomta), Ghodasar (Rah),Hajipir (Dhordo), Gadhada, Gadhsisa Halol, Hathsani, Jambusar, Kakwadi, Keshod, Khajod, Kharod, Khambhalia, Kheradi,Khimat, Khodu, Khumapur, Kotda Sangani, Kutiyana, Limzar (Vansda), Maglana, Mandali, Makansar,Mota Asrana, Manjusar, Munjpur, Nagor, Nichimandal (Vankda), Olpad, Patkhilori, Rangpar, Raghanesda, Rajula, Ramsan, Rupavati, Sarvala, Sisrana (Satlasana), Vansi, Veraval
		13	**Upgradation from existing 66 kV/132 kV to 220 kV level-** *66 kV:* Bhat, Bhildi, Gandhidham-B (or Padana), Kanbha, Mahuva, Sarigam, Siddheshwar, Velanja, Metoda, Mera. *132 kV :* Ankleshwar, Chiloda, Manjusar
132 kV Substation	1 No.		New substation: 132 kV Kansumra, Karli, Vidhutnagar, Sachin, Subhanpura

Source: Network Planning Report, GETCO, March 2024

Transmission schemes planned during FY 2028-29:

(1) 765 kV Transmission schemes:

Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
[A] 2026-27				
1.	765 kV Ghela Somnath (Saurashtra) (Rajkot)	1. 765 kV D/C Saurashtra - Vataman line 2. 400 kV D/C Kalvad - Saurashtra line 3. 765/400 kV, 2X1500 MVA ICTs 4. 400/220 kV, 3 X 500 MVA ICTs	400 240	RE Integration
[B] 2027-28				
2.	765 kV Saykha (Bharuch)	1. Upgradation of 400 kV Saykha substation to 765 kV level 2. 765/400 kV, 2X1500 MVA ICTs	--	System Strengthening
3.	765 kV Radhanesda PS (Banaskantha)	1. 400 kV D/C Radhanesda-Zerda line 2. 400 kV D/C Radhanesda-Kheralu line 3. 220 kV D/C Radhanesda-Tharad line 4. 220 kV D/C Radhanesda-Ghodasar line 5. 400/220 kV, 2 X 500 MVA ICTs 6. 400/220 kV, 4 X 500 MVA ICTs	100 180 50 90	RE Integration
4.	765kV Kutch PS –I (Kutch)	1. 765 kV D/C Kutch (PS)-1 - Kutch (PS)-2 line-I 2. 765 kV D/C Kutch (PS)-1 - Kutch (PS)-2 line-I 3. 765/400 kV, 2X1500 MVA ICTs	480 480	RE Integration

(2) 400 kV Transmission schemes:

Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
[A] 2024-25				
1.	400 kV Kalavad (Rajkot)	1. LILO of 400 kV D/C Essar-Hadala line at Kalavad substation 2. 220 kV D/C Bhatia – Kalavad line (Commissioned) 3. 220 kV D/C Kalavad – Kangasiyali line (Commissioned) 4. 400/220 kV, 2 X 500 MVA ICTs 5. 220/66, 2 X 160 MVA ICTs	16 238 112	RE Integration
[B] 2025-26				

Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
2.	400 kV Prantij (GIS) (Sabarkantha)	1. 400 kV D/C Prantij – Sankhari line 2. LILO of one ckt of proposed 400 kV D/C Wanakbori – Soja line at Prantij substation 3. 220 kV D/C Prantij – Agiyol line 4. 220 kV D/C Prantij – Dhansura line 5. 400/220 kV, 3 X 500 MVA ICTs 6. 220/66 kV, 2 X 160 MVA ICTs	100 40 60 70	RE Integration
[C] 2026-27				
3.	400 kV Saykha (Bharuch)	1. 400 kV D/C Pachchham - Saykha line 2. 400 kV D/C Shapar - Pachchham line LILO of 220 kV S/C Haldarwa – Dahej line and 220 kV S/C Wagra – Dahej line at 400 kV Saykha (Both circuit on M/C tower) 3. 220 kV D/C Saykha – Suva on M/C tower 4. 400/220 kV, 3 X 500 MVA ICTs 5. 220/66 kV, 2 X 160 MVA ICTs	320 320 2 1 5	System Strengthening
4.	400 kV Babarzar (Jamnagar)	1. LILO of both circuits of 400 kV D/C Bhogat – Kalavad line at Babarzar substation 2. 400/220 kV, 2 X 500 MVA ICTs	6	RE Integration
5.	400 kV Shivlakha (Kutch)	1. 400 kV D/C Bhachunda – Shivlakha line (Twin AL-59) 2. 400 kV D/C Shivlakha - Veloda (Sankhari) line (Twin AL-59) 3. LILO of both circuit of 220 kV D/C Tappar – Shivlakha line at Shivlakha (400 kV) substation (M/C tower AL-59) 4. 400/220 kV, 2 X 500 MVA ICTs 5. 220/66 kV, 2 X 160 MVA ICTs	210 245 25	RE Integration
[D] 2027-28				
6.	400 kV Keshod (GIS) (Junagadh)	1. LILO of both circuits of 400 kV D/C EPGL Vadinar - Amreli line at Keshod 2. LILO of both circuits of 220 kV D/C Visavadar - Timbdi line at 400 kV Keshod 3. 400/220 kV, 3 X 500 MVA ICTs	150 32 (M/C) 50	
7.	400 kV Balani Vav (Pipavav) (Amreli)	1. I. 400 kV D/C Pipavav-Amreli line 2. 2. 220 kV D/C Pipavav – Otha line	150 50	System Strengthening

Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
		3. 3. 220 kV D/C Pipavav-Bagasara line 4. 4. 220 kV D/C Pipavav – Rajula line 5. 5. 400/220 kV, 2 X 500 MVA ICTs 6. 6. 220/66 kV, 2 X 160 MVA ICTs	80 12	
8.	400 kV Achhalia (Bharuch)	1. 1. 400 kV D/C Kosamba – Achchhalia line 2. 2. LILO of 400 kV S/C SSP – Asoj line at Achhalia 3. 3. LILO of 400 kV S/C SSP – Kasor at Achhalia 4. 4. LILO of 220 kV D/C Ukai (T) – Achhalia line at 400 kV Achhalia 5. 5. Termination of 220 kV D/C GPEG – Haldarava line at Achhalia 6. 6. 220 kV D/C Suva – Achhalia line 7. 7. 400/220 kV, 2 X 500 MVA ICTs	140 40 40 20 90 140	System Strengthening

(3) 220 kV Transmission schemes:

Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
[A] 2024-25				
1.	Up-gradation of 66 kV Mera to 220 kV (AIS) (Banaskantha)	1. LILO of one circuit of 220 kV D/C Tharad- Deodar at 220 kV Mera substation 2. 220 kV D/C Mera – Agathala line 3. 220/66 kV, 2 X 160 MVA ICTs	10 70	System Strengthening (KSY)
2.	220 kV Bhesan (Junagadh)	1. LILO of 220 kV S/C Jetpur – Visavadar line at 220 kV Bhesan substation 2. 220 kV S/C Jetpur – Bhesan line 3. LILO of 220 Kv S/C Visavadar-Savarkundla line at 220 Kv Bhesan substation 4. 220/66 kV, 2X160 MVA ICTs	8 30 20	System Strengthening (KSY)
3.	220 kV Patkhilori (Rajkot)	1. LILO of one circuit of 220 kV D/C Tharad- Deodar at 220 kV Mera substation 2. 220 kV D/C Mera – Agathala line	40 50	System Strengthening (KSY)

Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
		3. 220/66 kV, 2 X 160 MVA ICTs		
4.	220 kV Babarzar (Jamnagar)	1. 220 kV Moti gop – Babarzar line 2. 220/66 kV, 2X160 MVA ICTs	20	System Strengthening (KSY)
5.	Up-gradation of 66 kV Metoda to 220 kV (GIS) (Rajkot)	1. LILO of 220 kV S/C Jetpur-Rajkot line at Metoda substation (3.2 U/g cable + 1 Overhead line) 2. 220/66 kV, 2 X 160 MVA ICTs	4.2	System Strengthening
6.	Upgradation of 66 kV Sarigam to 220 kV (GIS) (Valsad)	1. 220 kV D/C Bhilad - Sarigam line LILO of 220 kV S/C Tarapur - Vapi line at Sarigam 2. 220/66 kV, 2 X 160 MVA ICTs	15 (on M/C Tower)	System Strengthening
7.	Up-gradation of 66 kV Bhildi to 220 kV (GIS) (Patan)	1. LILO of both Circuit of 220 kV D/C Kansari (Zerda) – Deodar line at 220 kV Bhildi 2. 220/66 kV, 2 X 160 MVA ICTs	80	System Strengthening (KSY)
8.	Up-gradation of 66 kV Velanja 220 kV (GIS) (Surat)	1. LILO of 220 kV S/C GSEG - Kim line at Velanja 2. LILO of 220 kV S/C GSEG - Mora - Kim line at Velanja 3. 220/66 kV, 2 X 160 MVA ICTs	10 (on M/C Tower)	System Strengthening
[B] 2025-26				
9.	220 kV Sisrana (Banaskantha)	1. LILO of both circuit of 220 kV D/C Palanpur – Kheralu line at 220 kV Sisrana/Satlasana substation 2. 220/66 kV, 2X160 MVA ICTs	12	System Strengthening (KSY)
10.	220 kV Ghodasar Rah (Banaskantha)	1. LILO of both circuit of 220 kV D/C Tharad- Dhanera at 220 kV Rah substation 2. 220/66 kV, 2 x 160 MVA ICTs	20	System Strengthening (KSY)
11.	220 kV Nichimandal (Vankda) (Morbi)	1. LILO of both circuit of 220 kV Charadva - Bhimasar at 220 kV Shapar 2. 220/66 kV, 2 X 160 MVA ICTs	10	RE Integration
12.	220 kV Maglana (Bhavnagar)	1. 220 kV D/C Amreli (400 kV) - Maglana line 2. 220/66 kV, 2 X 160 MVA ICTs	200 10	System Strengthening
13.	220 kV Dhama (S'nagar)	1. 220 kV D/C Dhama - Bechraji line (AL-59) 2. 220/66 kV, 2 X 160 MVA ICTs	90	RE Integration
14.	220 kV Khambhalia (Jamnagar)	1. LILO of both circuits of 220 kV D/C Bhatia- Kalavad-Kangasiyali line at Khambhalia substation	40	RE Integration

Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
		2. 220/66 kV, 2 X 160 MVA ICTs		
15.	220 kV Makansar (Hybrid) (Rajkot)	1. LILO of 220 kV S/C Sartanpar - Wankaner line at 220 kV Makansar substation 2. LILO of 220 kV S/C Morbi - Hadala line at 220 kV Makansar substation 3. 220/66 kV, 2 X 160 MVA ICTs	2 20	System Strengthening
16.	220 kV Siddheshwar (GIS) (Rajkot)	1. LILO of both circuit of 220 kV D/C Kalavad – Kangashiyali line at 220 kV Siddheshwar substation 2. 220/66 kV, 3X160 MVA ICTs	5.5	System Strengthening
17.	220/66 kV substation at Hajipir / Dhordo / Luna (GIS) (Kutch)	1. LILO of 220 kV Akrimota – Nakhatrana and 220 kV Akrimota - Bhachunda lines at 220 KV Hajipir / Dhordo / Luna substation 2. 220/66 kV, 3X160 MVA ICTs	50	System Strengthening
18.	220 kV Munjpur (Patan)	1. LILO of 220 KV D/C Munjpur - Mehsana line 2. 220 KV D/C Dhama - Munjpur line (AL-59) 3. 220/66 kV, 2 x 160 MVA ICTs	60 60	RE Integration (GEC-II)
19.	Up-gradation of 66 kV Kanbha to 220 kV (GIS) (A'bad)	1. LILO of one circuit of 220 kV D/C Ranasan – Kanbha line at 220 kV Kanbha substation 2. 220 kV D/C Dehgam – Kanbha line 3. 220/66 kV, 2 X 160 MVA ICTs	0.5 5	System Strengthening
20.	220 kV Mota Asarana Dist. Amreli	1. LILO of both circuits of 220 kV D/C GPPC - Otha line at Mota Asarana (Mandan) 2. 220/66 kV, 2 X 160 MVA ICTs	80	System Strengthening
21.	220kV Khumapur Dist. Aravalli	1. LILO of one circuit of 220 kV D/C Agiyol - Mathasur (Bhutiya) line ay Khumapur 2. LILO of one circuit of 220 kV D/C Agiyol - Dhansura line ay Khumapur 3. 220/66 kV, 2 X 160 MVA ICTs	60 70	System Strengthening (KSY)
22.	220kV Khimat Dist. Banaskantha	1. LILO of both circuits of 220 kV D/C Zerda (Kansari) - Thavar (Dhanera) line at Khimat 2. 220/66 kV, 2 X 160 MVA ICTs	60	System Strengthening (KSY)
[C] 2026-27				
23.	220 kV Khajod (GIS) (Surat)	1. LILO of both the circuits of 220 kV D/C Kawas - Navsari (PG) line	10	System Strengthening

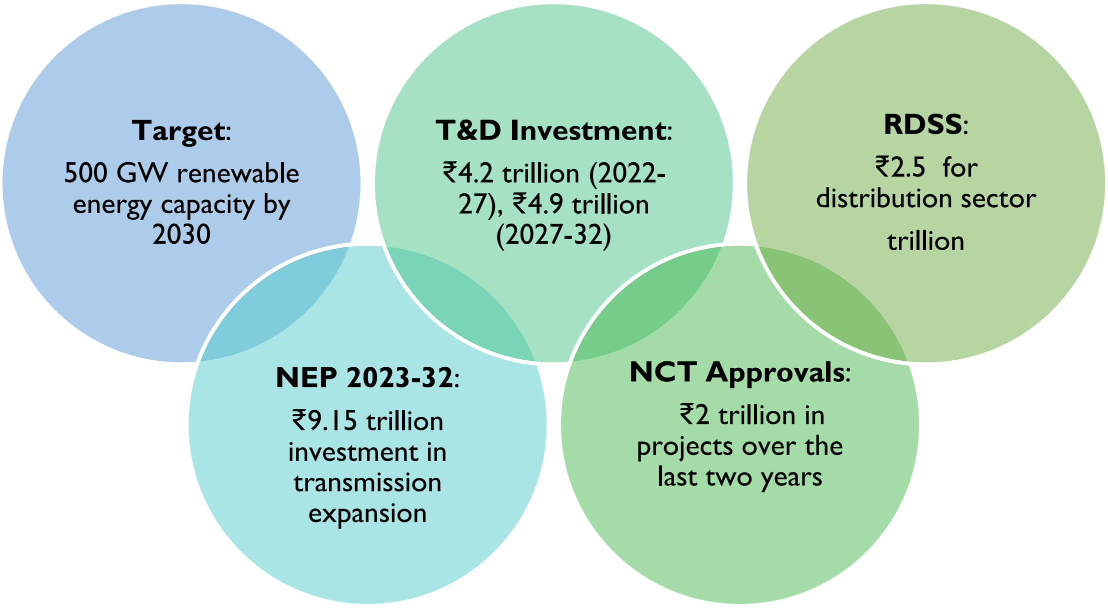
Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
		at 220 kV Khajod 2. 220/66 kV, 2 X 160 MVA ICTs		
24.	220 kV Olpad (GIS) (Surat)	1. LILO of both circuits of 220 kV D/C GSEG - Kosamba line at 220 kV Olpad substation with pile foundation 2. 220/66 kV, 2 X 160 MVA ICTs	35	System Strengthening
25.	220 kV Halol (GIS) (Panchmahal)	1. LILO of one circuit of 220 kV D/C Chandrapura - Godhara line at 220 kV Halol substation 2. LILO of one circuit of 220 kV D/C Vadodara – Vyankatpura line at Halol 3. 220/66 kV, 2 X 160 MVA ICTs	10 50	System Strengthening
26.	220 kV Padana / Bhimasar (Kutch)(GIS)	1. 220 kV D/C Varsana - Padana/Bhimasar line 2. 220 kV D/C Tappar - Padana/Bhimasar line 3. 220/66 kV, 3 X 160 MVA ICTs	24 (on M/C Tower)	System Strengthening (KSY)
27.	Upgradation of 132 kV Manjusar to 220 kV (Vadodara)	1. LILO of both ckt of 220 kV D/C Asoj - Mogar line at Manjusar 2. 220/132 kV 2x150 MVA ICTs	3	System Strengthening
28.	220 kV Keshod (Junagadh)	1. 220 kV D/C Keshod (400 kV) - Keshod line 2. 220 kV D/C Keshod (400 kV) - Veraval line 3. 220 kV D/C Keshod (400kV) - Shapur line 4. 220/66 kV, 2 X 160 MVA ICTs	46 90 50	System Strengthening
29.	220 kV Veraval (GIS) (Junagadh)	1. LILO of 220 kV S/C Keshod - Timbdi line at 220 kV Veraval substation 2. 220/66 kV, 2 X 160 MVA ICTs	16	System Strengthening
30.	220 kV Dharampur (AIS) (Valsad)	1. LILO 220 kV D/C KAPP – Vapi line at 220 kV Dharampur 2. 220/66 kV, 2 X 160 MVA ICTs	60	System Strengthening (KSY)
31.	220 kV Raghanesda Pooling Substation	1. 220kV D/C Vav (PG) – Raghanesda line 2. 220/33 kV 6 x125 MVA ICT	35	RE Integration
32.	220/66 kV Ramsan (near Thavar), Dist. Banaskantha	1. LILO of both circuits of 220 kV D/C Zerda (Kansari) - Khimat line at Ramsan 2. 220/66 kV, 2 X 160 MVA ICTs	100	System Strengthening (KSY)
33.	220/66 kV Gadhada, Dist. Botad	1. LILO of 220 KV S/C Amreli - Botad line at Gadhada 2. LILO of 220 KV S/C Dhasa - Botad line at Gadhada	40 40	System Strengthening (KSY)

Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
		3. 220/66 kV, 2 X 160 MVA ICTs		
34.	220/66 kV Dadusar (Mahudha), Dist. Kheda	1. LILO of both circuits of 220 kV D/C Wanakbori TPS – Kapadwanj lines at Dadusar 2. 220/66 kV, 2 X 160 MVA ICTs	100	System Strengthening
35.	220/66 kV Nagor, Dist. Kutch	1. LILO of both circuits of 220 kV D/C Nakhatrana Varsana lines at Nagor 2. 220/66 kV, 2 X 160 MVA ICTs	100	System Strengthening (KSY)
36.	220/66 kV Gadhsisa, Dist. Kutch	1. LILO of both circuits of 220 kV D/C Nakhatrana Nanikhakhar line at Gadhsisa 2. 220/66 kV, 2 X 160 MVA ICTs	100	System Strengthening (KSY)
37.	220/66 kV Kharod (Jantral), Dist. Mehsana	1. LILO of 220 kV S/C Vijapur - Agiyol line at Kharod 2. 220 kV D/C Prantij - Kharod line 3. 220/66 kV, 2 X 160 MVA ICTs	30 50	System Strengthening
38.	220/66 kV Rupavati (Bangavadi), Dist. Morbi	1. 1. LILO of both circuits of 220 kV D/C Hadala- Jamnagar line at Rupavati 2. 2. 220/66 kV, 2 X 160 MVA ICTs	120	System Strengthening (KSY)
39.	220/66 kV Bhalgamda, Dist. Morbi	1. 3. LILO of both circuits of 220 kV D/C Sadla - Halvad line at Bhalgamda 2. 220/66 kV, 2 X 160 MVA ICTs	100	System Strengthening (KSY)
40.	220/66 kV Kutiyana, Dist. Porbandar	1. LILO of 220 kV S/C Jetpur - Ranavav line at Kutiyana 2. LILO of 220 kV S/C Motipaneli - Ranavav line at Kutiyana 3. 220/66 kV, 2 X 160 MVA ICTs	30 60	System Strengthening (KSY)
41.	220/66 kV Hathsani, Dist. Rajkot	1. LILO of both circuits of 220 kV D/C Shapar 2. - Kamlapur line at Hathsani 3. 2. 220/66 kV, 2 X 160 MVA ICTs	40	System Strengthening (KSY)
42.	220/66 kV Dhank, Dist. Rajkot	1. LILO of both circuits of 220 kV D/C Motipaneli - Sardargadh line at Dhank 2. 220/66 kV, 2 X 160 MVA ICTs	80	System Strengthening (KSY)
43.	220 kV Gomta (Rajkot)	1. 220 kV D/C Kamlapur – Gondal II line 2. 220/66 kV, 2 X 160 MVA ICTs	30	System Strengthening
44.	Upgradation of 66 kV Mahuva to 220 kV (GIS)	1. LILO of both circuits of 220 kV D/C Mota - Chikhli (Ambheta) line at 220 kV Mahuva substation	10	System Strengthening

Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
	(Surat)	2. 220/66 kV, 2 x 160 MVA ICTs		
45.	220 kV Mandali (Mehsana)	1. LILO of 220 kV S/C Mitha – Soja line at 220 kV Mandali 2. 220 kV D/C Chharodi (400 kV) – Mandali line 3. 220/66 kV, 2 X 160 MVA ICTs	30 120	System Strengthening
46.	220/66 kV Chhala (Chiloda), Dist. Gandhinagar	1. 220 kV D/C Prantij - Chhala line 2. 220/66 kV, 2 X 160 MVA ICTs	70	System Strengthening
47.	220/66 kV Rangpar, Dist. Morbi	1. LILO of both circuits of 220 kV D/C Bhimasar (ISTS) - Nichi Mandal line at Rangpar 2. 220/66 kV, 2 X 160 MVA ICTs	60	System Strengthening
48.	220/66 kV Kotda Sanghani, Dist. Rajkot	1. LILO of 220 kV S/C Gondal - Kamlapur line at Kotda Sanghani 2. 220/66 kV, 2 X 160 MVA ICTs	50	System Strengthening
49.	220/66 kV Bhuteshwar (Avaniya), Dist. Bhavnagar	1. LILO of 220 kV S/C BECL - Botad line at Bhuteshwar 2. LILO of 220 kV S/C BECL - Vallabhipur line at Bhuteshwar 3. 220/66 kV, 2 X 160 MVA ICTs	70 70	System Strengthening
50.	220 kV Kakwadi Sea Food Park (GIS) (Valsad)	1. LILO of existing 220 kV Navsari-Atul and 220 kV Chikli - Vapi lines (after complete planned scheme LILO of both circuit of 220 kV D/C Chikhli - Atul line) at 220 kV Kankwadi / Danti substation 2. 220/66 kV, 2 x 160 MVA ICTs	42	Government Scheme
[D] 2027-28				
51.	220 kV Balethi (Surat)	1. LILO of one circuit of 220 kV D/C Ukai(TH) – Acchalia line at 220 kV Balethi 2. 220 kV D/C Kosamba – Balethi line 3. 220/66 kV, 2 x 160 MVA ICTs	15 35	System Strengthening
52.	220 kV Dumas (GIS) (Surat)	1. LILO of S/C Ichchhapore – Sachin line at 220 kV Dumas 2. LILO of S/C GSEG – Sachin line at 220 kV Dumas 3. 220/66 kV, 2 x 160 MVA ICTs	5 5	System Strengthening
53.	220 kV Vansi Borsi Textile Park (GIS) (Navsari)	1. LILO of both circuit of planned 220 kV D/C Navsari (New) (under construction POWERGRID substation) - Khajod lines at 220 kV Vansi / Borsi substation 2. 220/66 kV, 2 x 160 MVA ICTs	60	Government Scheme
54.	220 kV Jambusar Drug Park (GIS) (Vadodara)	1. LILO of both circuit of 220 kV D/C Amod- Gavasad at 220 kV Jambusar Drug Park substation	80	Government Scheme

Sr. No.	Name of Sub Station (District)	Name of Associated Transmission elements	Line Length (ckm)	Type of Scheme
		2. 220 kV D/C Saykha-Jambusar line 3. 220/66 kV, 2 x 160 MVA ICTs	60	
55.	220 kV Rajsitapur	1. LILO of 220kV SIC Bala - Dhanki & 220kV Bala 2. - Adalsar - line at 220kV Rajsitapur (220kV MIC line AL 59 conductor with OPGW)220/66 kV 3. 220/66 kV, 2X160 MVA ICTs	80 (on M/C Tower)	System Strengthening (KSY)
56.	220 kV Bagasara (Amreli)	1. LILO of 220 kV S/C Savarkundla-Visavadar line at Bagasara substation 2. 220/66 kV, 2 X 160 MVA ICTs	10	System Strengthening
57.	220 kV Sarvala (Tapi)	1. LILO of one circuit of 220 kV D/C Ukai (Hydro) – Chikda line at 220 kV Sarvala substation 2. 220/66 kV, 2 X 160 MVA ICTs	2X70	System Strengthening
58.	220 kV Limzar (Navsari)	1. LILO of both circuits of 220 kV D/C Navsari - Nasik line at 220 kV Limzar substation 2. 220/66 kV, 2 X 160 MVA ICTs	30	System Strengthening
[E] 2027 -28 & onwards				
59.	220 kV Chikda (Surat)	1. LILO of both circuit of 220 kV D/C Ukai(Hy) – Achhalia line at 220 kV Chikda 2. 220/66 kV, 2 X 160 MVA ICTs	120	System Strengthening
60.	Up-gradation of 132 kV	1. LILO of both circuits of 220 kV D/C Kawas TPS - Haldarwa line at Ankleshwar substation 2. LILO of one circuit of 132 kV D/C Achhalia – Ankleshwar line at Valia substation 3. 220/66 kV, 2 x 160 MVA ICTs 4. 220/132 kV, 2 X 150 MVA ICTs	10 15	System Strengthening
61.	Ankleshwar to 220 kV (GIS)(Bharuch)	1. LILO of both circuits of 220 kV D/C Gandhinagar TPS- Soja line at Chiloda substation 2. 220/132 kV, 2 X 150 ICTs 3. 220/66 kV, 2 x 160 MVA ICTs	60	System Strengthening

Analysis of Factors Driving the Growth of Power T&D Infrastructure in India



- **Renewable Energy Targets**

India aims to achieve **500 GW of renewable energy capacity by 2030**, which is pivotal for its clean energy transition. This ambitious target requires significant capital investment in power infrastructure to integrate renewable sources like solar and wind into the grid effectively. The shift towards renewables also demands modernization of power systems, including the development of advanced and digital grids capable of managing supply fluctuations.

- **Government Initiatives and Investments**

The **National Electricity Plan (NEP)** for **2023-32** outlines a strategic roadmap for enhancing transmission systems with a total investment of **INR 9.15 trillion**. Approximately **INR 4.2 trillion** is earmarked for T&D projects between 2022 and 2027, with an additional **INR 4.9 lakh crore** planned from **2027 to 2032.** Furthermore, the **Revamped Distribution Sector Scheme (RDSS)** aims to transform the distribution sector with an outlay of **INR 2.5 trillion**, focusing on reducing losses and enhancing infrastructure.

Demand landscape:

India's electricity demand has grown steadily over the last decade, driven by industrial expansion, rapid urbanization, and rural electrification. As the country advances on its developmental path, energy-intensive sectors and rising per capita consumption are creating sustained pressure on the power value chain from generation to last-mile distribution. Concurrently, agricultural mechanization and the growing penetration of irrigation systems are increasing power consumption in rural areas.

The government's proactive policy push through electrification schemes, infrastructure-focused programs like the National Infrastructure Pipeline (NIP), and support for renewable energy integration is further catalysing the need for robust power infrastructure. Additionally, rising household incomes, proliferation of electric appliances, and the digitalization of services are driving per capita electricity consumption higher. Together, these factors are generating strong and sustained demand across the electricity value chain from generation and transmission to last-mile distribution offering significant growth opportunities for EPC players engaged in developing and upgrading power infrastructure across the country.

Growth in Economic Activity & Industrialization: India's power demand is being significantly propelled by sustained economic growth and industrial expansion. In FY 2025, India's real GDP grew by 6.5% while nominal GDP rose by 9.8%, supported by robust sectors like construction and manufacturing. The construction sector alone grew around 9.4%, reflecting heightened infrastructure activity that drives demand for reliable electricity.

Meanwhile, the Central Electricity Authority's 20th Electric Power Survey forecasts India's peak demand to reach approximately 366 GW by FY 2031-32, and energy requirement to grow to about 2,473 BU a significant increase from nearly 1,852 BU projected for FY 2026-27. These projections underscore accelerating demand from industrial corridors, manufacturing zones, commercial complexes, and urban agglomerations. The policy emphasis on infrastructure and industrialization such as the development of industrial clusters, economic zones, and capacity expansion in manufacturing further amplifies electricity requirements.

Agricultural Power Demand: India's power demand is significantly influenced by its agrarian economy, where irrigation pump sets and rural mechanization contribute heavily to electricity consumption, thereby creating targeted opportunities for EPC firms in rural power systems and solar infrastructure. According to the Central Electricity Authority, agriculture accounted for approximately 16.53% of total electricity consumption in FY 2024. To reduce diesel dependency, enhance water and energy security and supplement farmers' income, the government rolled out the PM-KUSUM scheme under the Ministry of New & Renewable Energy.

Approved in March 2019 and extended to March 2026, this flagship program aims to deploy 34,800 MW of solar capacity across three components: decentralized solar plants (Component A), standalone solar pumps (Component B), and grid-connected pump solarization (Component C). This electrification and solarization efforts are expanding decentralized energy access in rural areas, while simultaneously boosting EPC demand particularly for off-grid solar projects, rural substations, and feeder-level distribution upgrades integrated with agricultural electrification.

Urbanization and Population Growth Driving Electricity Demand: Rapid urbanization and demographic growth are significantly elevating electricity demand in India's urban and peri-urban regions. According to the Government of India's *Handbook of Urban Statistics* , With India's urban population projected to reach 600 million by 2036 (≈40% of the total population), cities are becoming epicentres of electricity consumption. These urban centres expected to contribute nearly 75% of India's GDP are placing increasing demands on power distribution networks, substations, and monitoring systems, necessitating large-scale infrastructure upgrades.

Urban growth is intensifying electricity consumption across residential complexes, commercial centres, transportation nodes, and civic amenities. To meet this surge in demand, government programs such as the Smart Cities Mission and urban electrification policies are scaling investments into advanced power infrastructure such as underground cabling, automated substations, real-time monitoring systems, and SCADA networks creating a steady demand pipeline for EPC projects in urban power modernization.

Government Electrification Initiatives and Flagship Policies: India's mission to ensure 24×7 electricity access for all is built on a series of sequential electrification programs. These flagship government schemes have progressively expanded the reach and quality of power infrastructure across rural and urban India:

- **Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY)** – Launched prior to 2017, this scheme focused on rural electrification through the strengthening of sub-transmission and distribution infrastructure. Over **18,374 villages** were electrified under this program.
- **Saubhagya (Pradhan Mantri Sahaj Bijli Har Ghar Yojana)** – Introduced in **2017**, it targeted household-level electrification. By **March 2022**, it enabled power connections to over **2.86 crore** rural and urban households, delivering last-mile grid connectivity and meter installations.
- **Revamped Distribution Sector Scheme (RDSS)** – Approved in **2021**, this ongoing program has a total outlay of **INR 3.03 lakh crore**, including **INR 97,631 crore** in budgetary support. RDSS focuses on smart metering, feeder separation, distribution network strengthening, and grid reliability improvements continuing the electrification momentum while addressing AT&C losses.

This phased and layered approach to electrification has not only expanded power access but also created sustained opportunities for EPC players across grid extension, substation development, and smart metering rollouts.

Growth in Renewable Energy Capacity: India has reached a major milestone in its clean energy transition, with non-fossil fuel sources now accounting for over 50% of the country's total installed electricity capacity a target achieved five years ahead of the 2030 deadline, as confirmed by the Government of India in July 2025. As of June 30, 2025, total installed capacity stood at 484.82 GW, of which 242.78 GW (50.08%) came from non-fossil sources, including renewables (184.62 GW), large hydro (49.38 GW) and nuclear (8.78 GW). This landmark achievement underscores the impact of flagship programs such as PM-KUSUM, solar parks, and the National Wind-Solar Hybrid Policy, which have driven exponential growth in solar, wind, and bioenergy segments.

During FY 2025 alone, India added a record 29.52 GW of renewable energy capacity, led by solar (23.83 GW) and wind (4.15 GW). The clean energy project pipeline remains robust, with 169.40 GW under implementation and 65.06 GW tendered, including hybrid, RTC, and peaking projects. These developments are generating sustained EPC demand across generation, transmission, and storage infrastructure as India moves confidently toward its 500 GW non-fossil target for 2030.

Modernization Efforts - Smart Grids and Digital Infrastructure: India's power distribution grid is being transformed through digital modernization initiatives primarily the National Smart Grid Mission (NSGM) and the Revamped Distribution Sector Scheme (RDSS) under the oversight of the Ministry of Power. RDSS, which carries an outlay of approximately INR 3.03 lakh crore, aims to install 250 million prepaid smart meters by March 2026.

As of mid-July 2025, 20.33 crore smart meters have been sanctioned under the scheme, with 2.41 crore installed to date, including 2.27 crore already deployed across 28 states/UTs. Installation rates have accelerated from about 11,000-12,000 meters/day to nearly 80,000/day a significant scale-up in execution speed. These efforts are supported by NSGM-led pilots and RE/SCADA integration projects, and are reinforcing infrastructure modernization via smart metering, feeder-level monitoring, and substation automation creating expansive EPC demand for grid digitization.

Regulatory Landscape: Power Transmission & Distribution Segment

India's Power Transmission and Distribution (T&D) segment operates within a dynamic regulatory ecosystem that significantly influences infrastructure growth, grid modernization, and private sector participation. This framework guided by central and state regulatory bodies has evolved through key policy interventions aimed at enhancing grid reliability, financial sustainability of DISCOMs, and broadening electricity access nationwide. The sector is highly regulated, with various functions being distributed between multiple implementing agencies. The three chief regulators are: the Central Electricity Regulatory Commission (CERC), the Central Electricity Authority (CEA) and State Electricity Regulatory Commissions (SERCs). The Ministry of Power (MoP) works in close coordination with the CERC and CEA. While the CERC's role is more of a regulator for approving tariffs of central utilities, approving licenses, etc., the CEA is primarily a technical advisor focused on planning, i.e., estimating power demand and generation and transmission capacity.

Major Regulatory Bodies:

Ministry of Power (MoP)
- Central policymaking and coordination authority.
- Oversees key schemes like RDSS, UDAY.
- Supervises PSUs like NTPC, PGCIL.
- Drives reforms, investment policies, and grid modernization.
- Influences EPC activity through strategic planning and program implementation.

Central Electricity Authority (CEA)
- Technical advisor to MoP.
- Prepares National Electricity Plan (NEP).
- Sets technical/grid standards and safety norms.
- Tracks sector performance and operational benchmarks.
- Coordinates system-wide generation, transmission, and distribution.

Central Electricity Regulatory Commission (CERC)
- Regulates inter-state transmission and central tariffs.
- Promotes open access and power trading.
- Ensures transparency and competition in the power market.
- Its tariff frameworks impact EPC project bankability and bidding norms.

State Electricity Regulatory Commissions (SERCs)
- Regulate intra-state generation, transmission, and distribution.
- Set local tariffs, approve capex, resolve consumer issues.
- Approve DISCOM procurement and expenditure plans.
- EPC firms must align project proposals with SERC norms to win contracts.

Grid Controller of India Limited (formerly POSOCO)
- Operates National and Regional Load Dispatch Centres.
- Manages real-time grid operations, frequency, contingency, and balancing.
- Ensures smooth renewable integration and grid code compliance.
- Critical for testing, synchronization, and commissioning of transmission EPC projects.

Impact of Major Policy Power T&D Infrastructure

India's power sector is governed by a robust regulatory framework comprising central and state-level bodies that together ensure policy execution, operational reliability, and market discipline. These institutions ranging from policymaking authorities to tariff regulators and grid operators play distinct yet interlinked roles in shaping the sector's landscape. They facilitate transparent and competitive electricity markets, ensure infrastructure modernization, and drive alignment with national energy goals, including renewable integration and distribution reform. For Engineering, Procurement, and Construction (EPC) players, understanding the function and jurisdiction of these regulatory bodies is vital to navigate project approvals, grid compliance, and investment planning across generation, transmission, and distribution domains. **1. Ministry of Power (MoP)**

The Ministry of Power (MoP) serves as the central authority for policymaking, planning, and coordination in India's power sector. It oversees the implementation of key national programs such as the Revamped Distribution Sector Scheme (RDSS) and Ujwal DISCOM Assurance Yojana (UDAY), both of which are crucial for modernizing distribution infrastructure and improving the financial health of power utilities. The MoP also supervises major public sector undertakings (PSUs) like NTPC and Power Grid Corporation of India Limited (PGCIL), aligning their operations with national energy goals. In its broader mandate, the Ministry drives sectoral reforms, drafts investment-friendly policies, and supports grid modernization initiatives. Through strategic planning and targeted programs, the MoP significantly influences Engineering, Procurement, and Construction (EPC) activity across generation, transmission, and distribution segments.

2. Central Electricity Authority (CEA)

The Central Electricity Authority (CEA) operates as the technical arm of the Ministry of Power, offering expert advice on planning and operational matters. It plays a critical role in preparing the National Electricity Plan (NEP), a document that outlines medium- and long-term strategies for the power sector's growth. The CEA is also responsible for establishing technical and grid standards, as well as enforcing safety norms across generation, transmission, and distribution networks. Furthermore, it monitors sector-wide performance indicators and benchmarks, thereby providing data-driven insights for policy and investment decisions. Its role in system-wide coordination makes it a pivotal institution in ensuring operational readiness and standard compliance for EPC contractors.

3. Central Electricity Regulatory Commission (CERC)

The Central Electricity Regulatory Commission (CERC) is the primary body responsible for regulating inter-state transmission of electricity and setting central-level tariff structures. It promotes open access to the transmission network and facilitates power trading across states, thereby fostering competitive electricity markets. By enforcing transparency and competition, CERC plays a key role in shaping market dynamics. Notably, its tariff frameworks directly impact the bankability of EPC projects by influencing return expectations, pricing mechanisms, and bidding strategies. As a result, EPC players must stay aligned with CERC regulations to ensure project viability and financial closure.

4. State Electricity Regulatory Commissions (SERCs)

Each state in India has its own State Electricity Regulatory Commission (SERC), which governs intra-state generation, transmission, and distribution activities. SERCs are responsible for setting local electricity tariffs, approving capital expenditure plans of utilities, and resolving consumer grievances. They also play a central role in approving DISCOMs' power procurement and infrastructure investment proposals. For EPC firms operating at the state level, compliance with SERC regulations is essential. Project proposals must be structured in alignment with state-specific norms and tariff structures to secure approvals and win contracts, making SERCs highly influential in shaping localized EPC opportunities.

5. Grid Controller of India Limited (formerly POSOCO)

Grid Controller of India Limited, formerly known as Power System Operation Corporation (POSOCO), is tasked with operating the National and Regional Load Dispatch Centres (NLDC and RLDCs). It manages real-time grid operations, including frequency regulation, contingency management, and overall system balancing. The agency plays a critical role in ensuring smooth integration of renewable energy sources, maintaining grid code compliance, and avoiding system disruptions. For transmission EPC projects, especially those involving renewable energy evacuation, the Grid Controller of India Limited is essential for pre-commissioning activities like synchronization, load testing, and operational handover.

Revamped Distribution Sector Scheme:

The Revamped Distribution Sector Scheme (RDSS) has emerged as a flagship initiative aimed at enhancing the operational efficiency and financial sustainability of India's power distribution sector. The scheme was approved with a total outlay of **₹3,03,758 crore**, including **₹97,631 crore as Government Budgetary Support (GBS)**, for the implementation period from FY 2021-22 to FY 2025-26. As of December 2025, approximately **₹37,000 crore has been released** under the scheme, reflecting steady progress in fund disbursement linked to performance milestones and reform targets. Further, in the Union Budget FY 2026-27, **₹18,000 crore has been allocated towards power distribution reforms**, including ongoing RDSS-related initiatives, indicating continued policy emphasis on strengthening the distribution sector.. A major focus of the program is smart metering 204.6 million smart meters have been sanctioned, of which 24.1million have already been installed.

Furthermore, the scheme has contributed to narrowing the average cost–revenue gap (ACS–ARR) to INR 0.69/kWh, reflecting improved financial discipline across DISCOMs. These metrics indicate the scheme's scale and momentum, which in turn is catalyzing demand for EPC services related to metering infrastructure, IT system upgrades, SCADA rollout, and feeder separation, offering robust opportunities for both traditional EPC players and IT-BPM service providers engaged in execution, analytics, and system integration.

RDSS has two core components:

- Part A focuses on infrastructure modernization, including prepaid smart consumer metering, system metering (feeder and distribution transformer levels), and distribution network upgrades;
- Part B provides for capacity building, training, IT/OT enablement, and reform support.

Under the RDSS framework, financial assistance is disbursed based on a Results Evaluation Matrix DISCOMs must meet pre-qualification criteria and score at least 60% on weighted reform and infrastructure benchmarks. Eligible utilities must publish quarterly and annual audited accounts, eliminate creation of new regulatory assets, ensure timely subsidy payments, issue tariff true-up orders, and meet operational milestones. By February 2023, the Monitoring Committee had approved Action Plans and DPRs for 46 DISCOMs across 28 states/UTs. Sanctions included ~204.6 million prepaid smart meters, ~54 lakh DT meters, and ~1.98 lakh feeder meters, amounting to a sanctioned cost of over INR 1.15 trillion. These installations support real-time energy accounting and theft mitigation through advanced metering infrastructure (AMI).

As per updates from August 2023, AT&C losses dropped from 22.32% (FY 2020-21) to 16.4% (FY 2022), and the ACS–ARR gap shrank from INR 0.69/kWh to nearly zero. These achievements demonstrate early traction in reform-linked results. By mid-July 2025, the scheme had sanctioned 203.3 million smart meters across 28 states/UTs, with 24.1 million already installed. Additionally, allowing borrowing flexibility of 0.5% of GSDP, stricter prudential norms, and fuel/power cost adjustments have been introduced to incentivize utilities' discipline. Implementation challenges such as delays in feeder segregation and contractor responsiveness have been noted, e.g., in Jammu & Kashmir, where tender delays pushed project awards deep into 2023. Yet, progress continues with district-level modernization works expected to complete before the scheme's expiry in March 2026.

Modernization & Expansion of power T&D landscape in India: Government initiatives

Insight on Government schemes & flagship policies to improve the power generation capacity in India

India's power generation landscape is undergoing a transformative shift, guided by an ambitious mix of renewable energy targets, clean-tech manufacturing, and next-generation nuclear power development. In line with its international climate commitments and rising domestic energy demand, the Government of India has introduced a range of flagship schemes and policy frameworks to enhance installed capacity across diverse energy sources. These initiatives not only aim to accelerate clean energy deployment but also drive industrial growth, job creation, and energy security. Key government interventions span across large-scale solar deployment, rooftop solar access, solar-powered agriculture, small modular reactors, and incentives for domestic equipment manufacturing, all of which collectively form the backbone of India's energy transition.

- **Jawaharlal Nehru National Solar Mission (NSM) & Ultra Mega Solar Park Scheme:**

Launched on 11 January 2010, the NSM aimed first at 20 GW solar capacity by 2022 and was revised in 2015 to reach 100 GW (40 GW rooftop + 60 GW utility-scale) through central and state efforts, under the Ministry of New & Renewable Energy (MNRE). It introduced strategic measures such as tariff-based competitive bidding, ISTS waiver for RE projects, Solar Parks, Canal-top generation, and mandatory rooftop solar for public buildings, aligning with India's Nationally Determined Contribution of 50% cumulative power from non-fossil sources by 2030. The Development of Solar Parks & Ultra Mega Solar Power Projects scheme (extended until March 2026) supports infrastructure for large-scale solar power generation with a minimum capacities of 500 MW per park.

- **PM Surya Ghar - Muft Bijli Yojana:**

Launched by Prime Minister Narendra Modi on 13 February 2024, **the PM Surya Ghar- Muft Bijli Yojana** (approved on 29 February 2024) aims to empower 10 million residential households across India by March 2027 to install rooftop solar photovoltaic systems and receive up to 300 units of free electricity per month. The scheme carries a comprehensive INR 750.21 billion outlay, of which INR 657 billion is earmarked as Central Financial Assistance (CFA) to consumers, with additional components allocated for DISCOM incentives, Model Solar Villages, outreach, and capacity-building programs. Eligible households may receive CFA of up to INR 30,000 per kW for systems up to 2 kW and an additional INR 18,000 per kW for the third kilowatt (capped at 3 kW), translating to a maximum subsidy of INR 78,000 per household.

Consumers access benefits via the official national portal, select empanelled vendors, and receive subsidy transfers directly into their bank accounts shortly after installation and verification by DISCOMs. Eligible beneficiaries can also obtain concessional bank credit up to INR 2 lakh, collateral-free loans at ~6.75% interest or higher under supported schemes, to cover the balance system cost beyond the subsidy

- **PM-KUSUM Scheme (Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan):**

Launched in March 2019 by the Ministry of New & Renewable Energy (MNRE), the Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyaan (PM-KUSUM) aims to add 34,800 MW of solar capacity by March 2026, supported by a central financial outlay of INR 344.22 billion. The scheme is structured into three components: **Component A,** development of 10,000 MW decentralized grid-connected solar power plants (500 kW–2 MW) on fallow or barren land near substations; **Component B-** installation of 1.4–1.75 million standalone solar agriculture pumps in off-grid areas; and **Component C**- solarisation of 1–3.5 million grid-connected agricultural pumps, including feeder-level solarisation. **As of FY 2024-25,** a record 4.4 lakh pumps were installed under Component B and 2.6 lakh solarised under Component C drove scheme expenditure to INR 26.80 billion, marking a fivefold increase from the previous year.

- **Solar PV Module Production-Linked Incentive (PLI) Scheme:**

Launched under MNRE through the National Programme on High-Efficiency Solar PV Modules, the PLI Scheme (Tranche-II) allocates 39,600 MW of domestic module manufacturing capacity to 11 selected companies, backed by approximately INR 140.07 billion in central incentive support and expected investments of around INR 930.41 billion by 2026. The rollout timeline anticipates 7,400 MW operational by October 2024, 16,800 MW by April 2025, and the remaining 15,400 MW by April 2026.

When combined with Tranche-I's 8,737 MW, the scheme supports a total domestic solar module manufacturing capacity of 48,337 MW, backed by more than INR 185 billion in incentives. This initiative has already spurred the creation of over 1 lakh jobs (approx. 35,000 direct, 66,000 indirect), boosted domestic solar module capacity from under 10 GW to nearly 74 GW by March 2025, and sharply reduced India's reliance on imported modules. The scheme continues to promote integrated plants, local content sourcing and shifts in customs duty policy to further strengthen the Make in India framework.

- **Biomass-based Cogeneration Programme (Biourja Programme)**:

The "Promotion of Biomass-based Cogeneration in Sugar Mills and Other Industries" initiative, a subsystem under MNRE's National Bioenergy Programme (2021–26), offers targeted Central Financial Assistance (CFA) to encourage efficient power generation using industrial and agricultural biomass residues. Eligible developers including sugar mills and biomass plants can receive funding at the rate of INR 25 lakh per MW for bagasse-based cogeneration and INR 50 lakh per MW for non-bagasse biomass projects (e.g. agro-residue, wood waste, energy plantations).

Launched through the BioUrja portal, this scheme streamlines online application, tracking, and approval for CFA, lowering capital costs and improving project bankability. The programme not only bolsters renewable energy generation in rural and industrial hubs but also enhances farmer income, manages agro-residue responsibly, and reduces reliance on fossil-fueled power plants while advancing renewable cogeneration targets.

Insight on Government schemes to expand and modernize the power

India's power sector has witnessed significant reform and modernization efforts in recent years, especially in the Transmission and Distribution (T&D) segments, to meet the demands of growing energy consumption and increased renewable integration. The Government of India, through the Ministry of Power and the Ministry of New & Renewable Energy (MNRE), has launched transformative schemes aimed at improving grid reliability, reducing technical and commercial losses, deploying smart metering infrastructure, and strengthening inter-state and intra-state transmission networks. Below are key initiatives supporting this mission.

- **Revamped Distribution Sector Scheme (RDSS):** Launched in July 2021, the Revamped Distribution Sector Scheme (RDSS) is India's flagship initiative to reform state-owned power distribution companies (DISCOMs), with a total outlay of INR 3.04 trillion until FY 2025–26. It aims to reduce AT&C losses to 12–15% and eliminate the ACS–ARR gap by FY 2024–25. The scheme supports DISCOMs with funding for infrastructure upgrades, prepaid smart metering, feeder separation, and energy accounting systems. As of mid-2025, over 198 million smart meters have been sanctioned and smart meter installations are progressing at a rate of nearly 80,000 units per day. The scheme also mandates strict reform-linked disbursements, with performance benchmarks and transparency requirements.

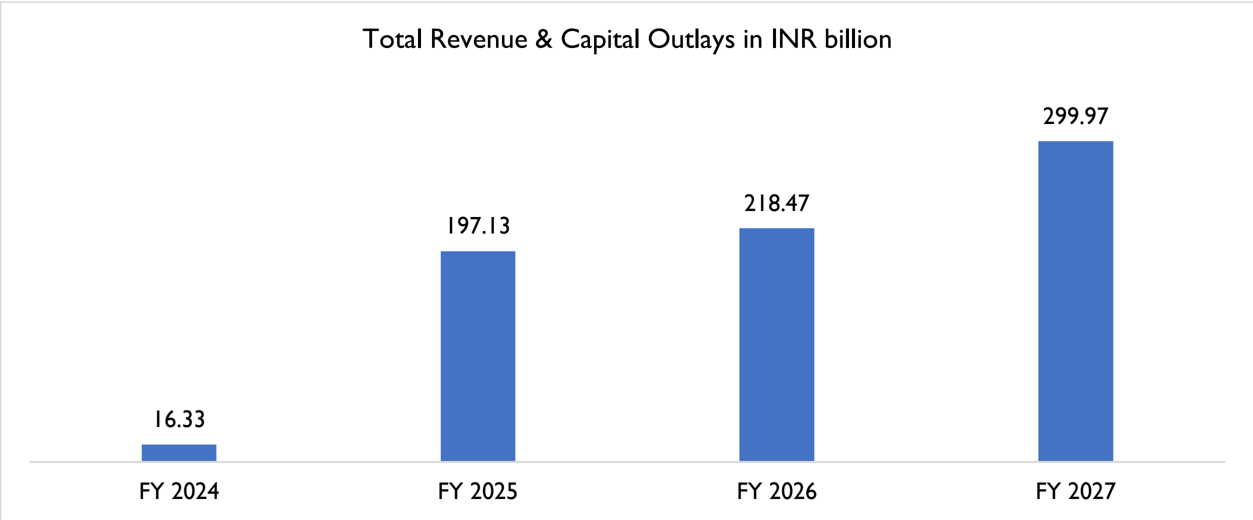
- **Green Energy Corridor (GEC):** The Green Energy Corridor (GEC) project, implemented in two phases by the Ministry of New and Renewable Energy (MNRE) in coordination with Power Grid Corporation of India, aims to develop dedicated transmission infrastructure for evacuating power from renewable energy (RE) generation zones to load centres. Under GEC Phase-I, intra-state transmission systems comprising approximately 9,700 circuit kilometres (ckm) of transmission lines and 19,000 MVA of substations were developed across eight RE-rich states. Building upon this, GEC Phase-II was approved by the Union Cabinet in January 2022 with a total outlay of INR 120.31 billion, targeting the construction of 10,750 ckm of transmission lines and 27,500 MVA of substations in seven states, including Gujarat, Rajasthan, and Tamil Nadu. The central government will provide 33% financial assistance for the approved projects, with implementation expected by 2025–26.

- **Inter-State Transmission System (ISTS) Strengthening:** The ISTS expansion, led by Power Grid Corporation of India Limited. (PGCIL) under the Ministry of Power, plays a critical role in transferring bulk power across regions. The government is aggressively expanding ISTS to accommodate large volumes of renewable energy through mega transmission projects. Notably, transmission charges for renewable and battery storage projects commissioned by June 2028 are waived, incentivizing investment in RE-heavy regions. Massive investments exceeding INR 2.5 trillion are being planned to strengthen the national transmission network, including 13 RE-rich clusters with targeted capacity addition of 500 GW non-fossil fuel power by 2030.
- **Smart Metering and Feeder Modernization:** Under the Revamped Distribution Sector Scheme (RDSS), smart metering plays a central role in improving billing efficiency, loss reduction, and consumer transparency. As of 15 July 2025, over 203.3 million crore smart consumer meters have been sanctioned. Additionally, the scheme includes 5.25 million Distribution Transformer (DT) meters and 1.95 million feeder meters to enable accurate energy accounting and localized performance monitoring. These infrastructure upgrades are further supported by the adoption of AI-based analytics and geospatial mapping for real-time outage detection and transformer health analysis. The RDSS framework ensures that funds are disbursed based on strict reform-linked benchmarks, promoting transparency and timely execution.
- **Urban Grid Modernization (e.g., Delhi Model):** Urban grid modernization has emerged as a strategic focus for state governments and DISCOMs, particularly in high-density, infrastructure-stressed cities. These initiatives aim to transition from legacy systems to smart, resilient, and aesthetically integrated power distribution networks. A leading example is Delhi, where utilities have begun replacing hazardous overhead low-tension (LT) lines with underground cabling, alongside the installation of smart feeder pillars, automated fault detection systems, and real-time restoration controls.

  Such upgrades significantly reduce fire hazards, improve urban aesthetics, lower forced outages, and minimize service disruption in congested zones. Under the Revamped Distribution Sector Scheme (RDSS) and the Delhi Government's FY 2025–26 budget allocation of INR 1000 million, the city's Janakpuri and adjoining areas have already been identified for full conversion to underground power supply. These modernization efforts are not only essential for improving supply reliability and public safety, but also lay the foundation for future-ready urban infrastructure, including EV charging, rooftop solar integration, and smart metering.

Latest budgetary outlay on improving the power infrastructure in India

India has significantly scaled up its budgetary outlay to strengthen and modernize its power infrastructure. This surge in allocations reflects the government's focus on achieving energy transition targets, enhancing distribution efficiency, and promoting clean energy adoption. Key flagship schemes such as the Reforms-Linked Distribution Sector Scheme (RDSS) and PM Surya Ghar Muft Bijli Yojana are central to this effort, with considerable funding earmarked to support DISCOM reforms, renewable energy expansion, and nuclear power generation.



Source: Union Budget FY 2025-26

- In **FY 2024**, the total outlay stood at just **INR 1,633 billion**, marking a low investment phase.
- However, in **FY 2025**, this increased sharply to **INR 198.45 billion**, reflecting renewed government focus on infrastructure and reform-linked funding.
- The upward trend continued into **FY 2026**, with the outlay climbing to **INR 218.47 billion**, suggesting sustained momentum in capital investment and operational funding for power sector development.
- The increasing trend continued into **FY 2027 as well**, with the outlay climbing to **INR 299.97 billion**, suggesting sustained momentum in capital investment and operational funding for power sector development.

This sharp increase of approximately **37.3% from FY 2026 to FY 2027** reflects a deliberate policy push to transform the sector through both immediate operational improvements and long-term infrastructure strengthening.A significant portion of the outlay is dedicated to the Reforms-Linked Distribution Sector Scheme (RDSS), which receives INR 180.00billion. The scheme focuses on the modernization of DISCOMs, enhancing supply reliability, and reducing Aggregate Technical & Commercial (AT&C) losses. It also provides states with an additional borrowing allowance of up to 0.5% of their GSDP, encouraging them to undertake distribution reforms and paving the way for increased private sector participation.

Further, INR 20.86 billion has been allocated for nuclear power development under the Nuclear Energy Programme in FY 2025–26. This underscores India's long-term commitment to a diversified energy mix and the importance of nuclear power as a reliable base-load energy source with low carbon emissions. Another major initiative, the PM Surya Ghar Muft Bijli Yojana, receives a massive INR 220 billion in buget 2026-27. As India's largest rooftop solar program, this scheme is aimed at promoting residential solar installations. It is expected to enhance household-level energy independence, reduce pressure on the national grid, and encourage the transition of consumers into prosumers, producers and consumers of electricity.

Inter-State Transmission System (ISTS) Scheme

The Inter-State Transmission System (ISTS) Scheme, spearheaded by the Ministry of Power and executed primarily through the Power Grid Corporation of India Limited (PGCIL), serves as the foundational framework for India's national power grid. Designed to enable seamless bulk power transfer across state boundaries, the ISTS plays a pivotal role in integrating diverse regional electricity markets and enhancing national grid reliability. A core focus of the scheme is the evacuation of renewable energy (RE), particularly solar and wind, from resource-rich zones to major consumption centres, thereby supporting India's clean energy goals and ensuring balanced, nationwide electricity access.

Waiver of ISTS Charges: To promote large-scale adoption of clean energy, the Government of India has extended a 100% waiver of Inter-State Transmission System (ISTS) charges for pumped storage hydropower (PSP) and co-located Battery Energy Storage Systems (BESS). The waiver applies to projects:

- Awarded (for PSP) or commissioned (for BESS co-located with renewables) on or before 30 June 2028
- Valid for 25 years from commissioning

Non-co-located BESS receive waivers based on existing Ministry of Power and CERC regulations; eligibility phases out gradually, with no waiver after 30 June 2028. This extension aims to accelerate grid integration of storage, support grid stability, and help achieve India's target of 500 GW non-fossil energy by 2030.

Extension for Solar & Wind RE Projects: The 100% ISTS waiver for solar and wind projects continues only for those commissioned on or before 30 June 2025. Eligible projects benefit from a 25-year full exemption. For projects commissioned between 1 July 2025 and 30 June 2028, waivers are phased down starting at 75% and reducing to 25%, after which no waiver applies to projects commissioned post 30 June 2028. The government has confirmed that it will not extend the 100% waiver beyond the June 2025 cutoff for solar and wind projects, although relief on a case-by-case basis may be considered for delayed projects facing force majeure or grid delay issues.

Project Capacity Milestones: As presented to Parliament by the Minister of State for Power, India's ISTS expansion plan targets a total capacity of approximately 340 GW for transmitting up to 230 GW of solar and wind energy. As of mid-2025:

- 48 GW of ISTS capacity has been completed and 159 GW is under construction
- 21 GW is under bidding and 112 GW remains in planning stages

Strategic Integration & Planning: All ISTS projects are integrated with the GatiShakti National Master Plan, which streamlines approvals, land acquisition, and infrastructure coordination across ministries. The Central Electricity Regulatory Commission (CERC) regulates interstate transmission tariffs, implements open access policies, and ensures tariff transparency across state lines. This ecosystem supports nationwide grid harmonization and competitive RE deployment.

One Nation - One Grid Initiative:

The One Nation – One Grid vision is a transformative national initiative aimed at unifying India's previously segmented regional electricity networks into a single, synchronous grid operating at one frequency. Spearheaded by the Ministry of Power and implemented by Power Grid Corporation of India Limited. (PGCIL), this effort forms the backbone of India's national power transmission infrastructure. It enables seamless and reliable power flow across regions, addresses regional frequency imbalances, and optimizes energy dispatch across state borders thus enhancing overall energy security and operational efficiency.

India originally operated five regional grids (Northern, Eastern, Western, North-Eastern, and Southern), and integration efforts began in 1991 through the establishment of HVDC/AC interconnections. The final milestone was achieved on 31 December 2013, when the Southern Grid was synchronously connected to the Central Grid via the 765 kV Raichur–Solapur transmission line culminating in the world's largest synchronous power grid operating at a unified frequency of 49.90–50.05 Hz. The Central Electricity Authority (CEA) continues to guide technical standards and regulatory compliance under the Electricity Act, 2003, ensuring harmonized and stable grid operations. This integrated grid architecture not only improves power reliability and transmission efficiency but also creates substantial Engineering, Procurement, and Construction (EPC) opportunities particularly in transmission infrastructure development aligned with India's broader national energy and decarbonization goals.

Operational Significance & Market Integration:

- Achieving a unified frequency has facilitated the National Load Dispatch Centre (NLDC) to manage grid operations centrally, enabling real-time inter-state power transfers, grid balancing, and national-level electricity trading.
- The initiative ensures open and non-discriminatory access to the nationwide grid via CERC's General Network Access (GNA) Regulations (2022), simplifying connectivity for developers and generators through standardized transmission access norms.

- Through this integrated framework, power from surplus regions can now reliably flow into deficit states, promoting energy equity, operational efficiency, and national marketplace alignment.

Key Benefits & Achievements:

- Seamless inter-regional electricity transfers help manage demand variability, particularly in high-demand states like Tamil Nadu, Kerala, and Haryana.
- The integrated grid enables robust platforms such as the **Green Day-Ahead Market (GDAM) and Green Term-Ahead Market (GTAM)** to function efficiently, aiding in renewable energy dispatch and trading.

Modernization Efforts: Smart Grids & Digital Infrastructure:

India's power infrastructure is undergoing a fundamental transformation driven by the twin goals of improving operational efficiency and ensuring long-term grid stability. As electricity demand grows rapidly particularly due to urbanization, renewable integration, and digital electrification the modernization of power generation, transmission, and distribution systems has become a national priority.

Central to this modernization are smart grids, digital metering infrastructure, and AI-enabled network management, which allow for real-time energy monitoring, enhanced outage management, and increased consumer participation. Supported by flagship government programs such as the Revamped Distribution Sector Scheme (RDSS) and the National Smart Grid Mission (NSGM), these efforts are paving the way for a data-driven, decentralized, and responsive electricity ecosystem.

- **Smart Metering Rollout under RDSS:** Under the Revamped Distribution Sector Scheme (RDSS), smart metering infrastructure has been a central reform tool to reduce losses and improve billing efficiency. As of mid-2025, approximately 198 million smart consumer meters, 5.25 million DT meters, and 1.95 million feeder-level smart meters were sanctioned across participating states. Of these, over 115 million consumer meters (≈58%) have been awarded, and around 20 million are already communicating data. These figures reflect an aggressive scaling of digital infrastructure in the power distribution segment.
- **Automation & Energy Accounting Systems:** Beyond smart metering, RDSS emphasizes automation tools such as feeder-level energy audits, distribution transformer (DT) health monitoring, and automated outage management systems. These upgrades enable utilities to shift from reactive to predictive maintenance, using real-time alerts and condition-based diagnostics. Integrated with AI analytics and geospatial mapping, these systems help identify high-loss zones, unauthorized usage, and supply bottlenecks at a granular level. This digital visibility not only improves power reliability and load balancing but also enhances transparency in power accounting, enabling DISCOMs to meet regulatory performance benchmarks and qualify for reform-linked funding.

- **National Smart Grid Mission (NSGM):** The National Smart Grid Mission (NSGM), launched in 2015 by the Ministry of Power, plays a pivotal role in modernizing urban power distribution networks through smart grid pilot projects. It supports the adoption of technologies such as Advanced Metering Infrastructure (AMI), Supervisory Control and Data Acquisition (SCADA), and Outage Management Systems (OMS) to improve the operational efficiency and transparency of utilities.

  Major urban DISCOMs including those in Delhi, Mumbai, and Bengaluru are leveraging NSGM support to implement real-time system monitoring, remote fault detection, and automated load control. These deployments have enhanced supply reliability, reduced downtime, and laid the foundation for intelligent grid operations in high-demand zones.
- **Digitalization of Transmission Systems:** As part of India's grid modernization strategy, the Power Grid Corporation of India Limited. (PGCIL) is advancing the digital transformation of the national transmission network. Through deployment of Wide Area Measurement Systems (WAMS) and Phasor Measurement Units (PMUs), PGCIL is enabling high-resolution, real-time monitoring of grid parameters across the Inter-State Transmission System (ISTS). These technologies strengthen dynamic load management, improve grid resilience, and facilitate seamless integration of variable renewable energy. The digital infrastructure also supports faster fault detection, voltage stability, and enhanced coordination between load dispatch centres, ensuring a responsive and future-ready transmission backbone.
- **Consumer-Centric Technologies & AI Integration:** India's power modernization agenda has mandated the adoption of Time-of-Day (ToD) tariffs under the Electricity (Rights of Consumers) Amendment Rules, 2023, requiring solar-hour rates to be 10–20% lower than normal tariffs and peak-hour rates to be 10–20% higher, depending on categories and time blocks.

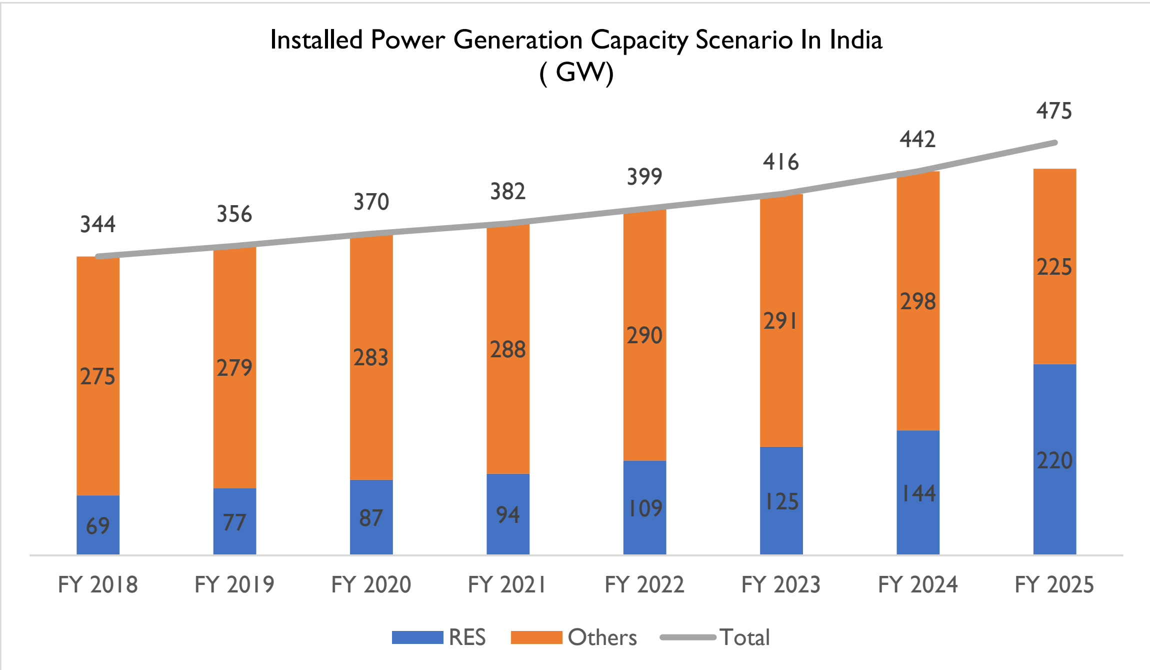
  ToD tariffs apply to commercial & industrial consumers from April 1, 2024, and to all non-agricultural consumers by April 1, 2025, with immediate applicability post smart-meter installation. These reforms are complemented by the rollout of prepaid smart meters, mobile apps, and AI-powered analytics to forecast peak loads, detect tamper events, and promote efficient consumer behavior. Together, the measures empower consumers with real-time insights and budgeting tools while improving DISCOM revenue assurance and grid flexibility.

Renewable Energy (RE) Scenario in India

Installed generation capacity & historical growth trends

India has made remarkable progress in expanding its renewable energy installed capacity, reflecting a strong commitment to sustainability and a greener energy future. Over recent years, the country has focused on harnessing renewable resources such as solar, wind, and biomass, leading to a significant transformation in its energy landscape. The installed capacity for renewable energy in India has demonstrated impressive growth. As of FY 2025, India's total installed power generation capacity reached approximately 475 GW, with renewable energy sources (excluding large hydro) accounting for about 46% of this total capacity. This marks a significant milestone in the country's renewable energy journey, highlighting the nation's growing commitment to sustainable energy. India's renewable energy capacity, which includes solar, wind, biomass, and small hydro, has surpassed 220 GW. Notably, solar energy capacity exceeded 100 GW by FY 2025, while wind energy also experienced substantial growth, reaching over 48 GW.

India globally ranks 4th in Renewable Energy Installed Capacity, 4th in Wind Power Capacity, and 5th in Solar Power Capacity, according to the International Renewable Energy Agency's 'Renewable Capacity Statistics 2023.' This remarkable achievement is a testament to the country's accelerated shift towards renewable energy. The increase in renewable energy share in India's overall energy consumption has been fueled by supportive policy measures from the government, coupled with a growing awareness of the environmental impact of non-renewable energy sources and a desire to reduce dependence on energy imports.



Source: Central Electricity Authority, Ministry of New and Renewable Energy

The expansion in various renewable energy sectors, including solar, wind, biomass, biogas, and tidal power, has played a crucial role in enhancing the country's renewable energy generation capacity. By FY 2025, renewable energy sources (excluding large hydro) accounted for approximately 46% of India's total installed power generation capacity, with renewable sources contributing nearly one-fifth of the country's total power generation output.

The substantial increase in installed renewable energy capacity brings multiple benefits, including enhanced energy security, job creation, and a reduction in greenhouse gas emissions. It also supports rural development and improves electricity access in remote areas, contributing to overall sustainable development.

Looking ahead, India is well-positioned to continue this growth trend in renewable energy capacity. Advancements in technology, coupled with ongoing investment and supportive policies, are expected to further accelerate the sector's expansion. This momentum solidifies India's role as a global leader in the transition to a sustainable energy future and reinforces its commitment to addressing climate change challenges. The growth in renewable energy installed capacity in India is a significant achievement, reflecting the country's dedication to clean energy and its proactive approach to building a sustainable and resilient energy system for the future.

Renewable Energy generation potential in India

India possesses immense renewable energy generation potential, owing to its vast and diverse geographical landscape and favourable climatic conditions. The country is naturally endowed with abundant solar radiation, wind corridors, biomass availability, small hydropower potential, and even prospects for emerging sources like offshore wind and green hydrogen. The Indian subcontinent receives high solar insolation throughout the year, making solar energy a key pillar in the country's clean energy roadmap. Similarly, regions such as the western coastal states, Tamil Nadu, Gujarat, and parts of central India offer strong wind profiles that have been effectively harnessed over the past two decades.

Strategically, India's renewable energy growth is also driven by the government's proactive policies, investment incentives, and international climate commitments. Initiatives such as the National Solar Mission, Renewable Energy Development Agencies in each state, and green energy corridors aim to unlock this potential through large-scale infrastructure and capacity-building. The government is promoting hybrid projects (wind-solar), floating solar parks, and decentralized systems for rural electrification. These efforts not only diversify the energy mix but also reduce dependence on fossil fuels, mitigate carbon emissions, and contribute to energy security.

Moreover, technological advancements and falling costs of renewable energy equipment have made projects more viable and scalable. With the emergence of energy storage systems, grid integration challenges are being addressed more effectively. India's renewable energy potential is not just about physical capacity it represents a strategic shift toward sustainable development. The integration of digital tools, smart grids, and energy markets further amplifies the opportunity to transform India into a global renewable energy leader.

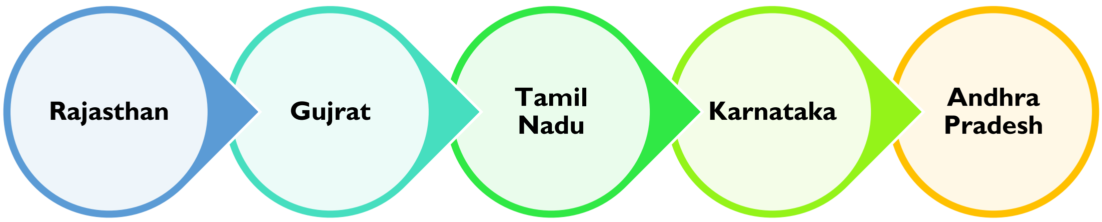
Potential RE zones identified in India

India's Renewable Energy Zones (REZs) are designated geographic areas identified for their high potential to generate renewable power primarily from solar and wind energy. These zones are part of the broader national strategy to accelerate the deployment of clean energy while ensuring cost-effective, large-scale integration into the national grid. The concept of REZs was introduced to overcome transmission bottlenecks by planning renewable energy generation and evacuation infrastructure in a synchronized manner. This proactive planning approach ensures that infrastructure is available in advance to support upcoming renewable projects, reducing delays and enhancing project bankability.

REZs are identified based on a combination of factors, including high solar irradiance, strong wind speeds, availability of land, and proximity to transmission corridors. The Ministry of New and Renewable Energy (MNRE), along with agencies like the Central Electricity Authority (CEA) and Power Grid Corporation of India Limited (PGCIL), have collaborated to identify several such zones across the country. These zones are primarily concentrated in states like Rajasthan, Gujarat, Tamil Nadu, Andhra Pradesh, and Karnataka regions known for their abundant renewable resources. Each zone is mapped not only for its technical viability but also for environmental and social compatibility.

Establishing REZs supports India's vision of achieving 500 GW of non-fossil fuel capacity by 2030. It facilitates optimal resource utilization and enables economies of scale in both generation and transmission. By clustering renewable projects in specific zones, the government can ensure more efficient land use, streamlined approvals, and targeted policy incentives. Moreover, REZs play a pivotal role in supporting India's commitments under the Paris Agreement by driving the transition to a low-carbon energy system while promoting sustainable development in remote or underdeveloped regions.

Major States Hosting Renewable Energy Zones:



- **Rajasthan**

Rajasthan is a frontrunner in renewable energy development, especially solar power, due to its vast arid lands and high solar insolation. The state has multiple solar parks and RE zones identified under both state and central schemes. Areas like Bhadla, Jodhpur, and Jaisalmer are key hubs. Rajasthan's infrastructure is being strengthened to export surplus renewable power to other states. The state is also aligned with national RE targets and green hydrogen initiatives.

- **Gujarat**

Gujarat has strong solar and wind potential, especially in regions like Kutch and Saurashtra. The state hosts significant REZs and hybrid renewable energy parks. It is actively developing transmission corridors to evacuate power from these zones efficiently. Gujarat is also investing in offshore wind energy development along its coastline. Its proactive policies and ease of land availability have made it a preferred RE destination.

- **Tamil Nadu**

Tamil Nadu has long been a leader in wind energy and is now expanding its solar capacity. The state's REZs are mainly located in southern and western regions with high wind speeds and solar irradiance. It has strong grid connectivity and is a net exporter of wind energy. The integration of renewable sources is being facilitated through advanced forecasting and grid-balancing measures. Tamil Nadu is also exploring offshore wind zones along its coastal belt.

- **Karnataka**

Karnataka has diverse renewable energy potential, especially in solar and wind, and was one of the first states to surpass 10 GW in renewable installations. REZs have been identified in districts like Tumkur, Chitradurga, and Ballari. The state benefits from coordinated efforts between local agencies and central planning bodies. Karnataka's RE growth is supported by hybrid energy development and smart grid initiatives. It continues to attract significant investment in renewable infrastructure.

- **Andhra Pradesh**

Andhra Pradesh's REZs leverage strong solar potential in Rayalaseema and wind corridors in southern districts. The state has actively partnered with central agencies to expand its transmission network and renewable integration. Land availability and low costs have made Andhra Pradesh attractive for utility-scale solar projects. It is also piloting solar-wind hybrid projects to improve grid stability. The state's renewable expansion aligns with national green energy corridors.

Transmission Planning with RE Zones:

Transmission planning is a critical component of renewable energy zone development in India. To ensure that electricity generated in REZs reaches demand centers efficiently, the Central Electricity Authority (CEA) and Power Grid Corporation of India Limited. (PGCIL) plan transmission systems well in advance of project commissioning. This includes dedicated green energy corridors, high-voltage substations, and inter-state lines designed to carry power from RE-rich states to load centers. Proactive transmission development reduces curtailment risks and enhances investor confidence in renewable energy projects.

The transmission plans also include dynamic load flow analysis and scenario-based projections, helping to address intermittency concerns and avoid congestion. Several REZs are located in remote or low-demand areas, making long-distance, high-capacity transmission lines essential. Integration of technologies like High Voltage Direct Current (HVDC) systems and real-time monitoring tools allows better handling of variable renewable power. Such coordinated planning is crucial to meet India's national renewable energy targets and ensure seamless grid integration.

National Renewable Energy Zones Project (NREZP):

The National Renewable Energy Zones Project (NREZP) is a collaborative initiative led by the Ministry of Power, MNRE, and supported by the U.S. Agency for International Development (USAID). The project's primary objective is to identify high-potential renewable energy zones and align them with necessary transmission infrastructure development. The NREZP adopts a systematic approach to mapping India's renewable resources and ensures early-stage planning for land use, transmission corridors, and environmental considerations.

Under NREZP, over 8 lakh hectares of land have been assessed for renewable potential, and multiple high-capacity zones have been identified for phased development. The project integrates state and central planning, reducing delays in project execution and optimizing cost efficiency. By aligning generation and evacuation in one framework, NREZP ensures the smooth rollout of large-scale renewable projects.

Steps taken by government to promote RE in the country:

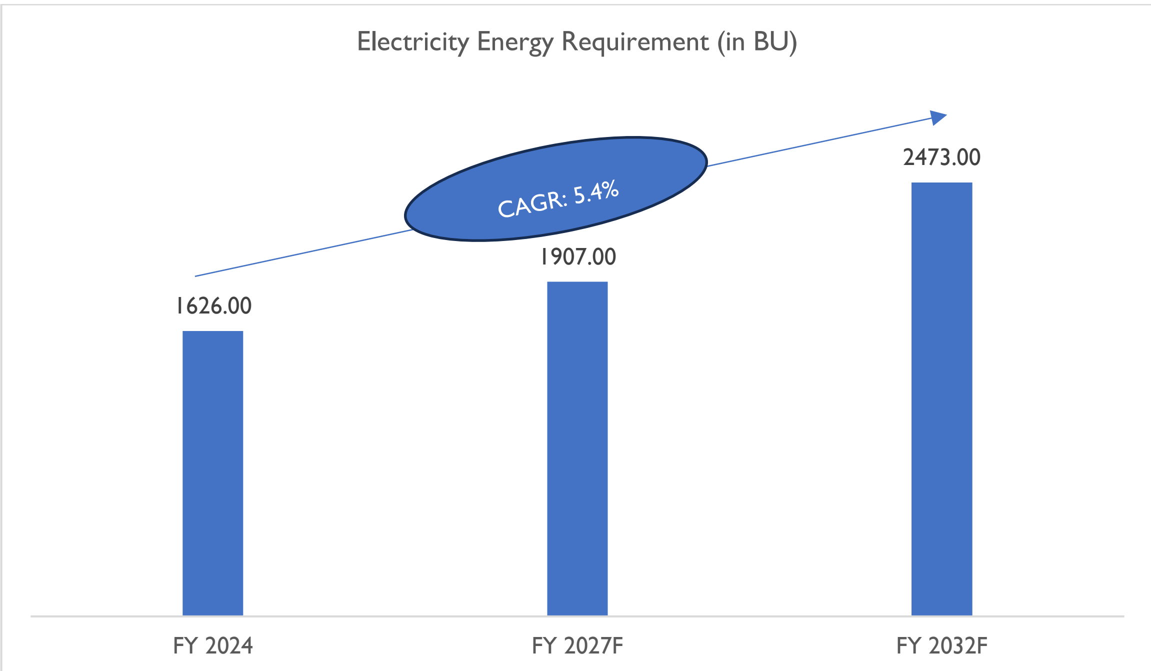
- Waiver of Inter State Transmission System (ISTS) charges for inter-State sale of solar and wind power for projects to be commissioned by 30th June 2025 and graded ISTS charges thereafter;
- Declaration of trajectory for Renewable Purchase Obligation (RPO) up to the year 2030;
- Launch of new schemes and programs, including Development of Solar Parks and Ultra Mega Solar Power Projects Scheme, Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan Yojana (PM-KUSUM), Grid Connected Solar Rooftop Programme, CPSU Scheme Phase-II (Government Producer Scheme), Production Linked Incentive Scheme under 'National Programme on High Efficiency Solar PV Modules, National Bioenergy Programme, Renewable Energy Research and Technology Development (RE-RTD) Programme, Schemes for incentives on electrolyser manufacturing and Green Hydrogen production under the National Green Hydrogen Mission;
- Setting up of Ultra Mega Renewable Energy Parks to provide land and transmission to RE developers on a plug and play basis;
- Laying of new transmission lines and creating new sub-station capacity for evacuation of renewable power;
- Setting up of Project Development Cell for attracting and facilitating investments;

- Standard Bidding Guidelines for tariff based competitive bidding process for procurement of Power from Grid Connected Solar PV and Wind Projects;
- Government has issued orders that power shall be dispatched against Letter of Credit (LC) or advance payment to ensure timely payment by distribution licensees to RE generators;
- Notification of Promoting Renewable Energy through Green Energy Open Access Rules 2022;
- Notification of Late Payment Surcharge and related matters Rules 2022;
- Notification of Electricity Amendment Rules 2022 with provision of Uniform Renewable Energy Tariff for Central Pool; and
- Launch of the National Green Hydrogen Mission with the objective to make India a hub for Green Hydrogen production and exports.

Growth Forecast

Expected growth in electricity demand in India

India has been experiencing a significant and steady increase in the demand for power and electricity, driven by rapid urban development, industrial growth, and the increasing use of electricity across sectors such as transport, housing, and manufacturing. Government-led initiatives promoting household electrification, electric mobility, and renewable energy integration are further accelerating this demand. Schemes supporting rooftop solar adoption and clean energy use are contributing to greater consumption at the grassroots level, while emerging areas like green hydrogen are beginning to shape future electricity needs. This rising demand reflects a broader transformation in India's energy consumption patterns as the country modernizes and urbanizes.



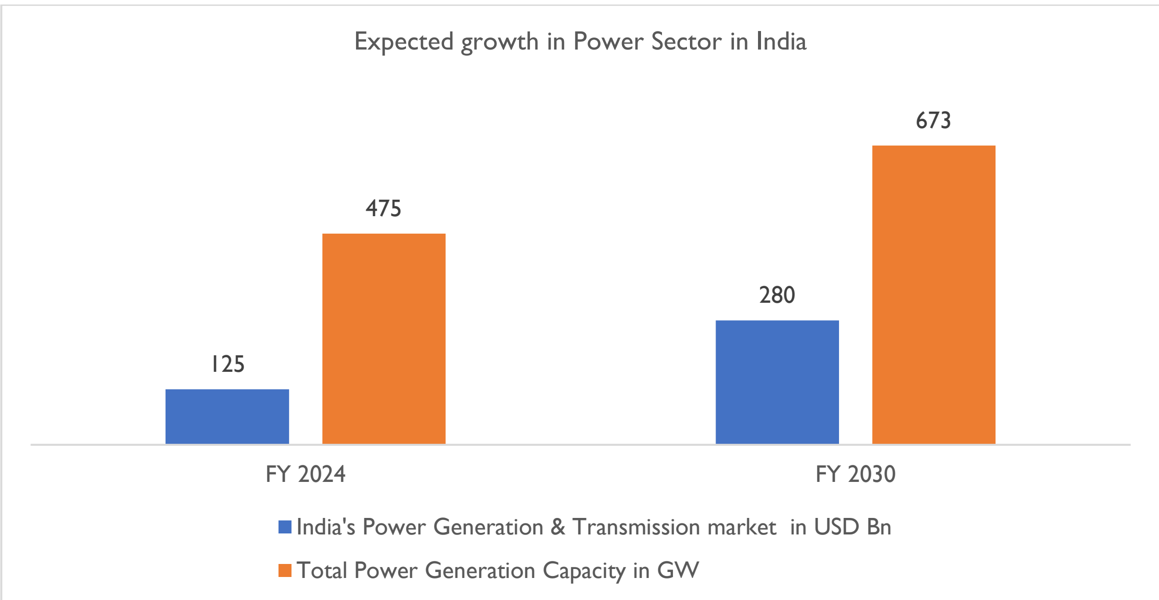
Sources: CEA, (Electric Power Survey, 2022)

The graph highlights a steadily increasing trend in India's electricity energy requirement, indicating the country's growing power needs over the next decade. Starting from 1,626 Billion Units (BU) in FY 2024, the requirement is projected to rise to 1,907 BU by FY 2027 and further to 2,473 BU by FY 2032. This progression reflects the rising demand driven by factors such as industrial growth, urbanization, increased household electrification, and the uptake of new electricity-intensive sectors like electric mobility and green hydrogen. Over this period, the CAGR from FY 2024 to FY 2032 is ~ 5.4%, signifying a healthy and sustained pace of growth in energy consumption.

Expected growth in the Electricity Sector

India's installed electricity generation capacity is expected to grow steadily in the coming years, driven by rising power demand, electrification of rural and urban sectors, and the country's commitment to energy security and economic development. The government's focus on '24x7 Power for All' and the expansion of industries, transport electrification, and digital infrastructure are pushing utilities and private players to ramp up capacity addition across conventional and renewable sources. The Central Electricity Authority (CEA), through its National Electricity Plan (NEP), outlines an integrated roadmap that balances coal-based generation while accelerating renewable energy, particularly solar and wind.

Renewable energy is poised to play a central role in India's future capacity additions, supported by favourable policies, international partnerships, and technological advancements. Solar parks, green hydrogen initiatives, and offshore wind developments are expected to supplement traditional capacity sources like coal and hydropower. Grid modernization, flexible generation technologies, and robust inter-state transmission networks are being developed in tandem. Overall, India's strategy involves not just adding more gigawatts but building a cleaner, smarter, and more resilient power generation infrastructure to meet long-term national goals.



Source: D&B Research, Secondary Research

India's power generation and transmission sectors are projected to **expand 2.2 times, reaching USD 280 billion** between FY24 and FY30. The country's total power generation capacity is expected to increase from **442 GW in FY24 to 673 GW by FY30**. Renewable energy capacity is also set to expand, with annual capacity additions projected to increase **3.5 times** between FY24 and FY27 compared to FY10-20, aligning with India's target of achieving **500 GW of renewable energy by 2030**.

India's Power Transmission & Distribution (T&D) infrastructure is expected to grow, supported by government initiatives and increasing electricity demand. The **"One Nation – One Grid – One Frequency"** initiative has interconnected regional grids, enhancing power availability and transfer across the country. ***According to the India Investment Grid, as of October 24, India has an inter-regional transmission capacity of 1,12,250 MW, transmission lines spanning 4,64,286 circuit kilometres (ckm), and a transformation capacity of 11,48,167 MVA.***

The government plans to add approximately **17,500 ckm** of transmission lines and **80,000 MVA** of transformation capacity annually over the next three years. This expansion is aimed at integrating over 500 GW of renewable energy capacity by 2030, supporting India's energy transition efforts.

The power transmission sector is also expected to grow, with the bid pipeline increasing from less than **INR 150 billion in February 2021 to INR 1 trillion** in projects currently up for bidding. This growth is being driven by the government's focus on expanding renewable energy capacity and increasing demand for storage, green hydrogen, data centers, and electric vehicle infrastructure.

The scale of this expansion also emphasizes the importance of transmission planning being synchronized with generation projects, especially renewables under various government schemes. Strengthening of intra-state and inter-state corridors is essential for the seamless transmission of power and maintaining the 'One Nation, One Grid' vision. The CEA's plan also reflects the long-term evolution toward a digitally controlled, modern transmission network, with grid automation, demand forecasting tools, and real-time load flow analysis becoming integral to operational efficiency and reliability.

Insight on voltage-wise segmentation

Voltage-Wise Substation

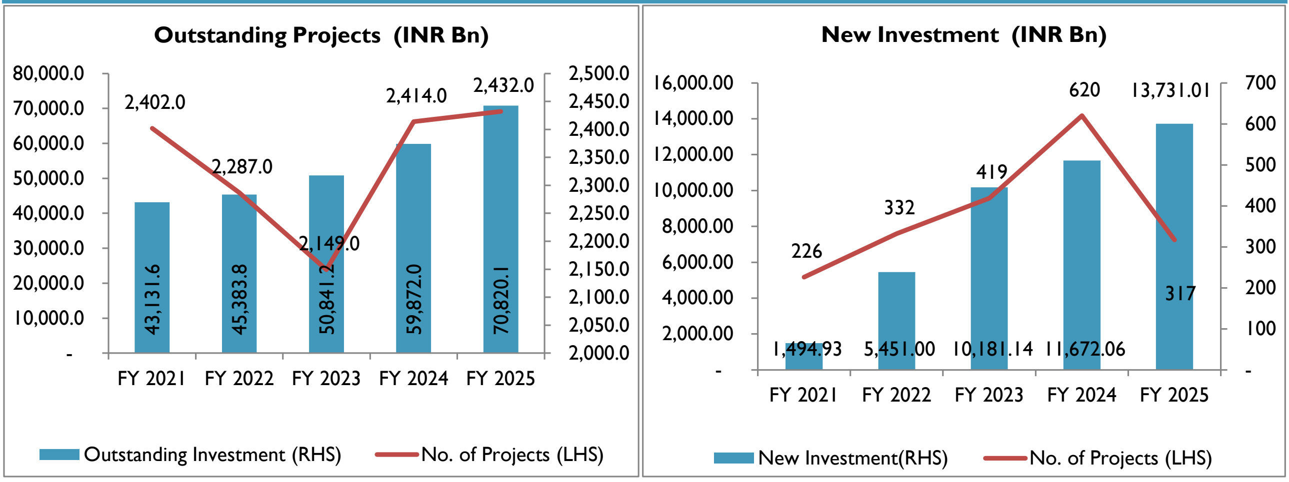
As of July 2024, India's substation distribution reveals significant variations across different voltage levels and sectors. At the 220 kV level, most substations are state-owned i.e. 455,599 with Central and Private sectors contributing 14,521 and 1,957 substations, respectively. For the 400 kV level, the Central sector leads with 212,420 substations, followed closely by the State sector with 221,653 and the Private sector with 28,350. The 500 kV level shows a smaller number of substations, with the Central sector having 9,500, the Private sector 2,500, and the State sector 1,500. At 765 kV, the Central sector dominates with 238,700 substations, while the Private and State sectors have 31,000 and 28,000 substations, respectively. Lastly, at the 800 kV and 320 kV levels, the Central sector has 18,000 and 2,000 substations, with no contributions from the Private or State sectors at these voltage levels.

Voltage Level	Central	Private	State
220 kV	14,521	1,957	455,599
400 kV	212,420	28,350	221,653
500 kV	9,500	2,500	1,500
765 kV	238,700	31,000	28,000
800 kV	18,000	NA	NA
320 kV	2,000	NA	NA

The growth in substation capacity over the years and the bifurcation of substations across various voltage levels reflect India's commitment to expanding and modernizing its power infrastructure. The increasing capacity and strategic distribution of substations are critical to ensuring a reliable and efficient power supply across the country, supporting both current and future energy demands.

Capex Plans in Power Sector

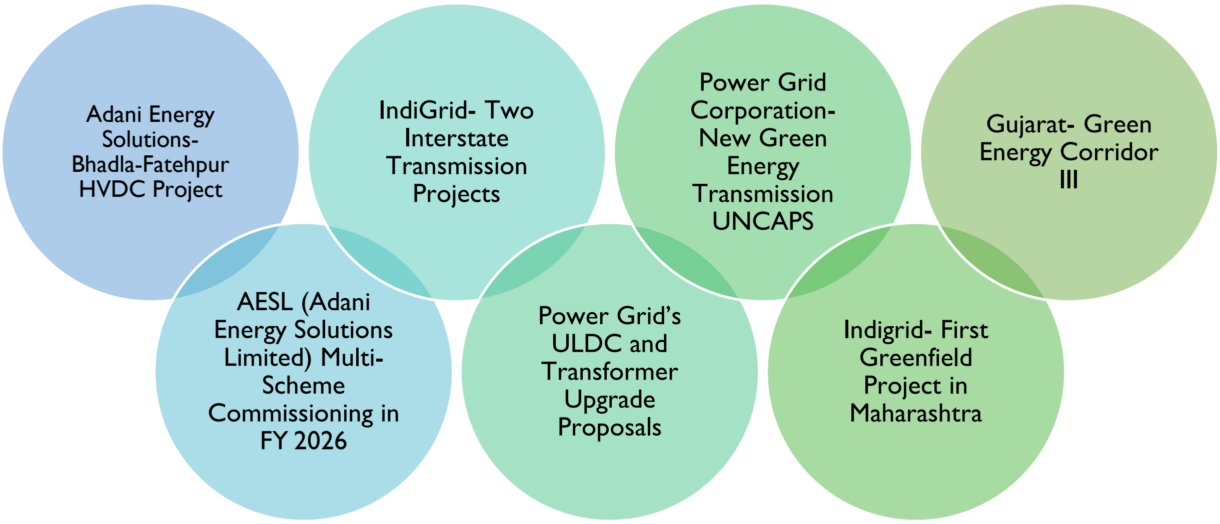
Investment Trend in Power Sector



Sources: CMIE Capex

The investment data captured by the CMIE capex reflects, steady growth new investment in value terms in the FY 2025 however the number of new projects announced dipped in FY 2025 simultaneously which reflect high value project being announced in the sector.

Brief insight on the notable projects announced / under implementation in power T&D sector (during the last 6-12 months)



- **Adani Energy Solutions- Bhadla-Fatehpur HVDC Project:** This is an INR 25,000 crore, 6 GW HVDC transmission project commissioned under tariff-based competitive bidding. It covers over 2,400 circuit-km and is intended to evacuate renewable energy from the solar-rich Bhadla zone in Rajasthan to demand centers in northern India. This mega-project significantly boosts India's renewable evacuation capacity and reinforces grid integration across states.
- **IndiGrid- Two Interstate Transmission Projects:** IndiGrid (an InvIT) won LOIs for two greenfield inter-state transmission schemes on a BOOT basis, totaling over INR 1,000 crore Capex. One project evacuates power from a 2 GW Dhule Renewable Energy Zone; the other expands Western Region transmission in Madhya Pradesh, including substations and LILO line setups. Both projects are designed to support renewable evacuation and grid expansion.
- **Power Grid Corporation- New Green Energy Transmission UNCAPS:** PGCIL secured three critical ISTS projects: evacuation systems from Rajasthan REZ Phase-V (4 GW), boosting transformation capacity at Banaskantha, Gujarat, and an ISTS link for Kurnool-IV REZ in Andhra Pradesh. Combined, these projects are worth INR 10,750 crore and feature new substations, transmission lines, and pooling stations.
- **Gujarat- Green Energy Corridor III:** The Gujarat government announced an INR 29,000 crore investment to develop GEC-III, which includes over 3,430 ckm of 765 kV lines and 860 ckm of 400 kV lines, connecting major RE zones in Kutch, Jamnagar, and central Gujarat. The corridor aims to transmit 16,500 MW of clean energy and enhance grid quality via statcom installations.
- **AESL (Adani Energy Solutions Limited) Multi-Scheme Commissioning in FY 2026:** Adani Energy expects to fully commission six transmission schemes in FY 2026 including inter-state and intra-state projects with a combined Capex of INR 43,990 crore. The portfolio expansion includes over 696

ckm of new transmission lines and 15 projects under construction, strengthening capacity for renewable energy evacuation.

- **Power Grid's ULDC and Transformer Upgrade Proposals:** PGCIL approved INR 6.5 billion in early 2024 for two key projects: ULDC Phase-III SCADA/EMS upgrade at northern SLDCs, and augmentation of a 765/400 kV transformer at Bhiwani as part of the Leh-Kaithal renewable corridor. Both expected to be commissioned in 2025.
- **Indigrid- First Greenfield Project in Maharashtra:** Indigrid commissioned its first standalone project Kallam Transmission Limited in Beed, Maharashtra to evacuate 1 GW of renewable power from Dharashiv region. The project supports local RE integration and strengthens regional power evacuation infrastructure.

Summary of Transmission System Planned for the period 2022-2027

Transmission Line planned at the end of period 2026-2027:

System Type		At end of 2016-17	Addition during 2017-22	At end of 2021-22	Planned addition during 2022-27	At end of 2026-27	Total
Transmission lines (ckm)	Transmission lines ckm ISTS	1,58,859	41,177	2,00,036	51,185	2,51,221	5,71,403
	Transmission lines ckm Intra-State	2,08,992	47,688	2,56,680	63,502	3,20,182	
Transformation capacity (MVA)	Transformation capacity MVA ISTS	4,05,809	2,15,254	6,21,063	4,37,905	10,58,968	18,81,780
	Transformation capacity MVA Intra-State	4,01,842	1,48,431	5,50,273	3,38,425	8,88,698	

Source: National Electricity Plan, October 2024

State-wise Transmission line planned and likely investment for the same at the end of period 2026-2027:

State/UT	Transmission lines (ckm)	Transformation Capacity (MVA)	Likely Investment (₹ in Cr)
Andhra Pradesh	4,005	13,040	8,176
Assam	725	2,780	1,102
Bihar	1,539	2,200	1,905
Chhattisgarh	1,497	5,090	2,615
Goa	40	581	169
Gujarat	10,449	37,445	22,859
Haryana	1,934	14,805	4,767
Himachal Pradesh	393	2,521	1,041
Jammu Kashmir	1,054	3,590	1,745
Jharkhand	708	2,475	1,708
Karnataka	702	14,800	2,938
Kerala	1,303	4,093	2,373
Madhya Pradesh	2,923	10,525	5,900
Maharashtra	6,705	31,950	19,959

Meghalaya	659	320	551
Nagaland	214	400	300
Odisha	2,143	5,000	3,750
Punjab	656	8,725	2,364
Rajasthan	3,932	21,720	14,537
Tamil Nadu	4,940	32,857	16,993
Telangana	3,011	16,108	8,119
Uttar Pradesh	9,858	50,205	22,386
Uttarakhand	294	2,660	1,089
West Bengal	3,296	7,120	5,080
Total	**62,980**	**2,91,010**	**1,52,426**

Source: National Electricity Plan, October, 2024

EPC Segment

Overview: EPC services & advantages

Engineering, Procurement, and Construction (EPC) is a widely adopted project delivery model in the power infrastructure sector, where the contractor assumes full responsibility for the project from design to commissioning. EPC contracts streamline execution by combining all critical activities under a single entity, ensuring accountability and efficiency. This integrated approach reduces the complexities of multi-vendor coordination, minimizes delays, and provides a predictable cost and time framework for project owners.

In the power sector, EPC contractors play a crucial role in building generation facilities (thermal, hydro, and renewable), high-voltage transmission systems, substations, and distribution networks. These projects require technical expertise, regulatory compliance, and advanced engineering to ensure reliability and sustainability. EPC services address these needs by integrating engineering precision, procurement efficiency, and construction excellence into a single contract.

One of the major drivers for EPC adoption in power infrastructure is the increasing demand for renewable energy integration. Solar and wind power projects, for instance, require rapid deployment and cost optimization, making EPC contracts a preferred model. By managing design, procurement of solar modules or wind turbines, and construction under a single scope, EPC contractors enable faster project execution, helping India meet its ambitious renewable energy targets. Additionally, EPC services often include advanced technologies such as smart grid solutions, SCADA systems, and automation tools, which improve operational efficiency and grid reliability. This technological edge allows EPC firms to offer value beyond construction, making them critical enablers of modernization in India's power T&D sector. Overall, EPC solutions combine speed, efficiency, and technical robustness, providing an end-to-end pathway for the development of sustainable and resilient power infrastructure.

EPC Services: Stages

- **Engineering & Design:** EPC companies provide comprehensive engineering services, including feasibility studies, detailed design, and structural layouts. They conduct load flow analysis, grid interconnection studies, and system optimization to ensure the infrastructure meets technical and safety standards. This phase lays the foundation for efficient and reliable operations.
- **Procurement of Equipment & Materials:** Procurement involves sourcing transformers, switchgear, conductors, control panels, and other essential components. EPC firms handle vendor evaluation, negotiations, logistics, and quality checks to ensure compliance with standards. This guarantees timely availability of equipment, preventing costly project delays.
- **Construction & Civil Works:** The construction phase includes tower erection, substation development, and laying transmission or distribution lines. EPC contractors deploy skilled manpower and advanced machinery for on-site work, ensuring adherence to design specifications. Strict safety protocols are followed to minimize accidents and delays during execution.
- **Installation & Commissioning:** Post-construction, EPC contractors install electrical systems, integrate automation controls, and conduct rigorous testing. This includes synchronization with the national or regional grid, load testing, and performance verification. Commissioning ensures that the system is fully operational and compliant with regulatory standards before handover.
- **Project Management & Quality Assurance:** EPC firms manage project timelines, budgets, and compliance reporting through robust project management systems. They implement QA/QC frameworks to maintain the highest quality standards throughout the project lifecycle. This ensures timely completion and minimizes rework, saving both time and cost.
- **Maintenance & Post-Commissioning Support**: Some EPC contracts include long-term maintenance and operational support services. These involve regular inspections, equipment servicing, and emergency troubleshooting. This ensures high system reliability and maximizes asset life, reducing unplanned outages.

Advantages:

Single Point Responsibility: EPC contracts provide a single point of accountability for all project phases, eliminating coordination issues between multiple contractors. This simplifies communication and ensures smooth execution from start to finish.

Cost and Time Efficiency: By integrating engineering, procurement, and construction under one umbrella, EPC projects achieve better cost control and timely delivery. Reduced delays and optimized procurement processes help minimize budget overruns.

Technical Expertise & Innovation: EPC firms bring specialized engineering expertise and adopt the latest technologies such as SCADA, GIS, and smart grid systems. This enhances project quality and operational efficiency while ensuring compliance with technical norms.

Risk Mitigation for Clients: Project-related risks, such as cost escalation, delays, and compliance issues, are transferred to the EPC contractor. This reduces financial exposure for the client and provides certainty regarding timelines and budgets.

Quality Assurance & Compliance: EPC contracts include strict adherence to quality standards and regulatory norms throughout the project cycle. This reduces operational risks and ensures the infrastructure performs reliably over its lifecycle.

Faster Renewable Energy Deployment: For solar and wind projects, EPC solutions accelerate timelines by bundling all phases under one contract. This enables India to rapidly expand renewable capacity while reducing integration challenges.

Lifecycle Support: Many EPC providers extend support beyond commissioning, offering maintenance and operational services. This ensures long-term asset reliability, improved efficiency, and better return on investment.

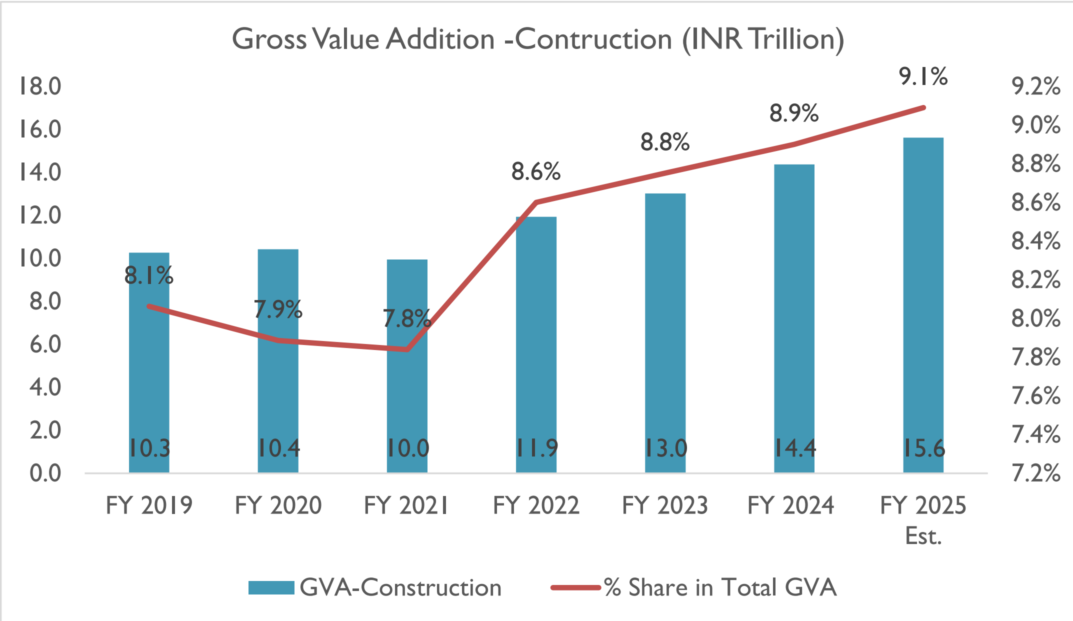
Construction scenario in India and role played by EPC industry.

Overview: Construction Scenario in India

The construction sector serves as a vital pillar of the Indian economy, with extensive linkages spanning over 250 ancillary industries such as cement, steel, paints, bricks, tiles, and more. It ranks as the second-largest economic activity in the country after agriculture, contributing an estimated 9.1% to the national Gross Value Added (GVA) in FY 2025, according to data from the Ministry of Statistics and Programme Implementation (MoSPI). When combined with outputs from real estate services and ownership of dwellings, the broader construction ecosystem contributes approximately 14.3% to the total GVA at constant prices.

Characterized by high employment elasticity and a significant multiplier effect, the sector has the capacity to generate up to five times the income in other industries for every unit of investment, underscoring its importance in driving inclusive growth and industrial development. Construction is also the second-largest employment generator in India, providing jobs to nearly 71 million individuals in FY 2023, as reported by the Periodic Labour Force Survey (PLFS). This number is projected to surpass 100 million by FY 2030, propelled by increasing demand for infrastructure in both urban and rural areas, along with growth in the housing and industrial sectors.

The sector plays a crucial role in creating direct employment across various disciplines such as engineering, architecture, project management, and skilled trades. Additionally, it supports a wide range of indirect employment through its strong backward and forward linkages with industries such as manufacturing, transportation, logistics, and equipment leasing. Over the years, the contribution of the construction sector to the national economy has steadily increased. By FY 2025, its GVA is projected to reach approximately INR 15.6 trillion, accounting for about 9.1% of the national GVA.



Source: Ministry of Statistics & Programme Implementation (base year 2011-12)

The chart presents a clear upward trend in the Gross Value Addition (GVA) by the Indian Construction sector from FY 2019 to an estimated FY 2025. In absolute terms, the sector's contribution has grown from INR 10.30 trillion in FY 2019 to an estimated INR 15.60 trillion in FY 2025, reflecting a significant expansion in construction activity across infrastructure, housing, and industrial domains. The dip observed in FY 2021, where GVA fell to INR 10.0 trillion, coincides with the economic slowdown and disruptions caused by the COVID-19 pandemic. However, the strong recovery from FY 2022 onward with GVA reaching INR 14.40 trillion in FY 2024 demonstrates the sector's resilience and the impact of large-scale government capital expenditure programs, such as the National Infrastructure Pipeline (NIP) and PM Gati Shakti.

In relative terms, the construction sector's share in total GVA initially declined from 8.1% in FY 2019 to 7.8% in FY 2021, again reflecting pandemic-related contractions. Post-FY 2021, the share steadily increased, reaching 9.1% in FY 2025 (est.), indicating not just absolute growth but a stronger role of construction in the overall economy. This rise suggests an intensification of infrastructure-driven development, with construction increasingly contributing to India's GDP. The positive trend aligns with the government's focus on urban development, transportation networks, affordable housing, and industrial corridors.

Government focus on infrastructure construction:

The infrastructure construction segment serves as a cornerstone of India's economic advancement and national development. It encompasses the creation, expansion, and maintenance of critical public infrastructure that supports connectivity, productivity, and improved living conditions. As a foundational pillar of the economy, this segment not only facilitates the movement of goods and people but also plays a vital role in shaping the socio-economic landscape of the nation. Infrastructure development is closely linked to industrial growth, urbanization, and regional development, contributing significantly to job creation, income generation, and improved access to essential services. With India embarking on ambitious infrastructure programs ranging from highways and smart cities to energy corridors and digital infrastructure this segment continues to act as a powerful enabler of inclusive growth, long-term competitiveness, and sustainable development.

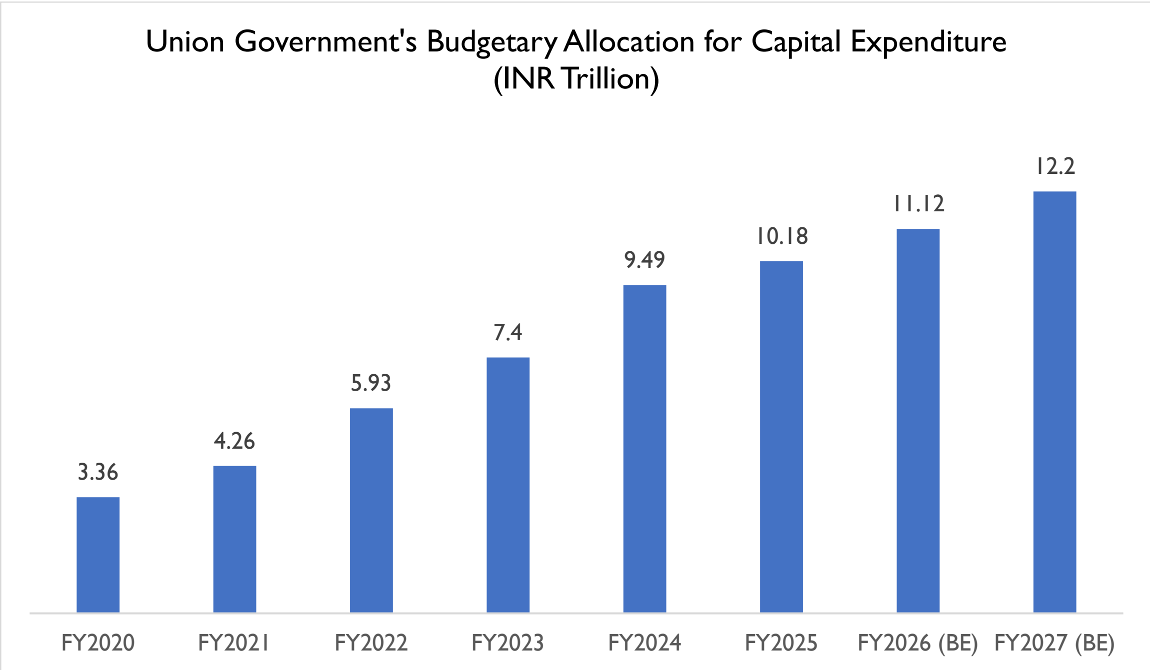
- **Enhancing Connectivity**: Robust transportation networks facilitate the seamless movement of people and goods, thereby strengthening trade and regional integration.
- **Driving Economic Activity**: Infrastructure projects stimulate job creation, attract private and public investment, and catalyse growth across multiple sectors of the economy.
- **Improving Living Standards**: Infrastructure development ensures access to essential services such as clean water, sanitation, and uninterrupted electricity, significantly enhancing the quality of life.

The infrastructure construction sector is broadly classified under Transport and Logistics Infrastructure, which includes roads, highways, railways, airports, ports, and allied facilities. The Indian government has placed **infrastructure construction at the heart of its economic growth strategy**, recognizing it as a key enabler of long-term development, employment generation, and industrial competitiveness. Through flagship initiatives like the **National Infrastructure Pipeline (NIP)**, **PM Gati Shakti**, **Smart Cities Mission**, and **Bharatmala and Sagarmala programs**, the government is driving coordinated investments in roads, railways, ports, airports, logistics hubs, and urban infrastructure. These initiatives aim to address critical infrastructure gaps, reduce logistics costs, and create seamless multimodal connectivity across the country. The government's strategic intent is to leverage infrastructure as a productivity multiplier and attract private investment through well-structured public-private partnerships (PPPs).

In parallel, policy measures such as faster project clearances, reforms in contract enforcement, digitization of approval processes, and increased central outlay in annual budgets reflect a clear push toward **efficient project execution and transparent governance**. Institutions like the National Investment and Infrastructure Fund (NIIF) and Development Finance Institutions (DFIs) have also been strengthened to support capital mobilization. By linking infrastructure development with larger national goals such as energy transition, digital connectivity, and regional economic balance the government is creating a long-term vision that ensures infrastructure construction remains a high-priority and high-impact area for public investment and private sector participation alike.

Government Increasing Budgetary Allocation to infrastructure sector.

One of the key drivers for economic growth is the increased infrastructure investment thrust by the Government of India. The Union Government's budgetary allocation for capital expenditure has seen a consistent and significant upward trajectory over the past several years, reflecting a strong commitment to infrastructure development and long-term economic growth. This progressive increase underscores the government's focus on building robust infrastructure, boosting public investment, and supporting sustainable economic development across sectors. In the Union Budget for Fiscal 2026, the Government of India has increased the capital expenditure by 10.1% (over the previous year's revised budget allocation) to nearly ₹ 12.2 trillion, -which indicates the strong Government of India focus on improving the overall infrastructure landscape in India.



Union Budget, Government of India

Allocation to Key Sectors

Key Sectors									
Value in INR BN	**FY'20**	**FY'21**	**FY'22**	**FY'23**	**FY'24**	**FY'25**	**FY'26 RE**	**FY'27 B.E.**	**y-o-y Growth FY'26**
Railway	678.42	299.26	1,172.71	1,592.56	2,426.48	2,552.63	2554.66	2,813.77	0.08%
Road & Bridge	707.14	922.94	1,167.88	2,104.96	2,698.65	2,994.60	2,871.41	3,098.75	-4.11%
Power	13.74	30.19	35.2	20.83	69.99	197.13	215.85	299.96	9.50%
Water Transport	0	0	4.68	5.44	10.11	28.37	28.99	51.64	2.19%
Irrigation	2.59	1.33	1.59	1.38	1.8	107.27	74.44	65.90	-30.60%
House & Urban Development	37.13	17.21	43.6	67.99	44.7	532.55	572.03	855.22	7.41%
Total of the above	1,439.02	1,270.92	2,425.65	3,793.17	5,251.74	6,412.55	6,317.38	7,185.24	-1.48%

y-o-y growth in FY 2026 is B.E. over RE, B.E is Budgeted Estimate, and R.E. is revised estimates. For the irrigation sector, major irrigation, major &medium irrigation, minor irrigation, drainage and Flood control is considered

Witnessing the CAGR growth of the budgetary allocation historically, construction of the road & highway, railway, energy and power and Urban Infrastructure has remained a focused area over the period FY 2020-24. In the Union Budget 2026-27, spending towards energy and power, water transport increased substantially over the previous year's revised estimate. Substantial budgetary allocation for the development of roads, railways, airports, and urban infrastructure, the government stimulates economic growth and improves public facilities.

Infrastructure construction scenario in India

India's infrastructure construction sector is expanding rapidly, driven by initiatives like the National Infrastructure Pipeline (NIP), PM Gati Shakti, and ambitious renewable energy targets. This growth is underpinned by large-scale investments in power, transportation, and industrial infrastructure, creating significant demand for advanced construction solutions. Within this context, the EPC (Engineering, Procurement, and Construction) segment has become a critical enabler, offering integrated project delivery that ensures timely execution, cost efficiency, and quality assurance across complex infrastructure projects.

In the power sector, infrastructure construction requires specialized capabilities to build generation plants, transmission corridors, substations, and distribution networks. EPC firms handle these end-to-end responsibilities under a single contract, reducing the challenges of multi-vendor coordination and mitigating risks for project owners. This model has been particularly effective for large renewable energy projects, high-voltage transmission systems, and smart grid implementation areas that demand technical precision, rapid execution, and regulatory compliance.

The EPC segment has also embraced technological advancements such as digital project monitoring, Building Information Modeling (BIM), and automation in construction equipment, improving accuracy and reducing material wastage. These innovations, combined with expertise in integrating smart grid solutions and energy-efficient designs, position EPC-led construction as a cornerstone of India's shift toward sustainable and future-ready infrastructure.

Looking ahead, the synergy between the construction industry and EPC players will remain vital to meeting India's infrastructure and energy goals. With growing requirements for renewable energy evacuation systems, urban electrification, and advanced transmission networks, EPC-driven models offer the strategic advantage of streamlined execution and enhanced risk management, making them indispensable for large-scale infrastructure development in India.

Key EPC players in India

The EPC (Engineering, Procurement, and Construction) industry in India is dominated by a few large players with significant expertise in executing complex and capital-intensive projects. These companies operate across multiple sectors, including power generation, transmission and distribution (T&D), renewable energy, oil & gas, and industrial infrastructure. Their capabilities extend beyond traditional construction to integrated project delivery models that include advanced engineering design, efficient procurement strategies, and on-site construction with commissioning. These firms have been instrumental in driving India's infrastructure growth, particularly in building high-voltage transmission networks, solar parks, wind farms, and smart grid systems that support the country's renewable energy ambitions.

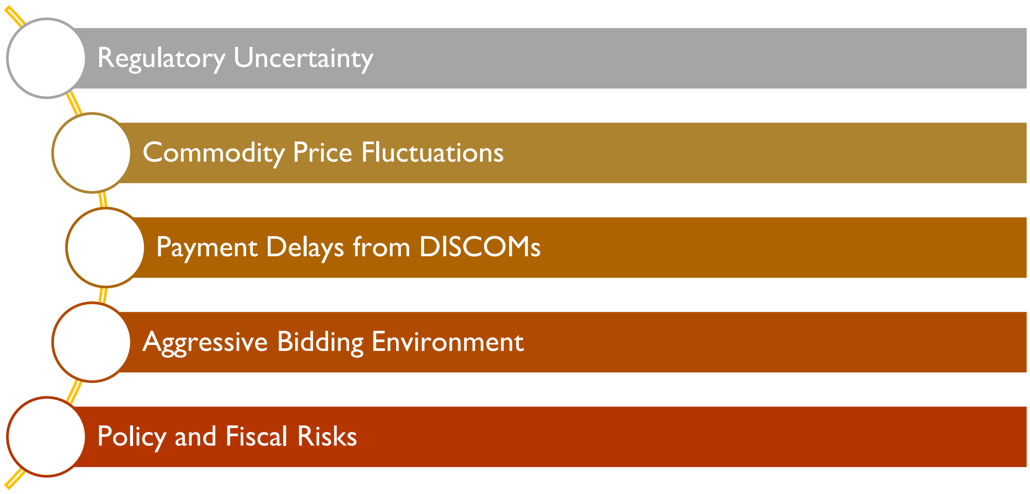
Key EPC players in India, such as Larsen & Toubro (L&T), Sterlite Power, Tata Projects, Kalpataru Power Transmission (KPTL), KEC International, and Adani Energy Solutions Limited, have established strong domestic and global footprints. These companies leverage technological innovations, digital project management tools, and sustainable construction practices to enhance project efficiency and quality. Their strategic role in developing Green Energy Corridors, renewable evacuation infrastructure, and large-scale transmission systems positions them as critical enablers for India's goal of becoming a global renewable energy leader.

Here are some additional sector-wise key players in India:

Sector	Top 5 EPC Players
1. General Infrastructure	Larsen & Toubro (L&T), Tata Projects Limited., Shapoorji Pallonji Group, NCC Limited., Punj Lloyd Limited.
2. Oil & Gas / Hydrocarbon	Engineers India Limited. (EIL), L&T Hydrocarbon Engineering, Technip Energies India, Toyo Engineering India, KSS Petron
3. Power (Thermal/Renewable)	BHEL, Sterlite Power, Kalpataru Power Transmission Limited., Suzlon Energy, ReNew Power
4. Transport (Road/Rail/Metro)	IRCON International, AFCONS Infrastructure, GR Infraprojects, Dilip Buildcon Limited., Rail Vikas Nigam Limited.
5. Water & Urban Infrastructure	VA Tech Wabag, SPML Infra Limited., Ion Exchange, Ramky Infrastructure, L&T Construction (Water & Effluent BU)
6. Industrial & Process Plants	ThyssenKrupp Industrial Solutions, FLSmidth India, UHDE India, Holtec Consulting, Jacobs Engineering India

Key threats and challenges in power EPC segment

Key Threats:



- **Regulatory Uncertainty:** Regulatory Uncertainty poses a significant threat to EPC projects in India's power sector. Frequent amendments to environmental regulations, land acquisition rules, and grid connectivity procedures often lead to delays in project approvals and cost escalations. For example, obtaining Environmental Impact Assessment (EIA) clearance, forest clearances, and securing right-of-way (ROW) can be time-consuming and subject to policy shifts at both central and state levels. These uncertainties are particularly challenging for long-gestation projects like transmission lines or large-scale renewable parks, where planning is done years in advance. The lack of consistency in regulations also deters private investment and makes financial closure more complex. As a result, EPC contractors face increased compliance risks and uncertainty in project timelines.

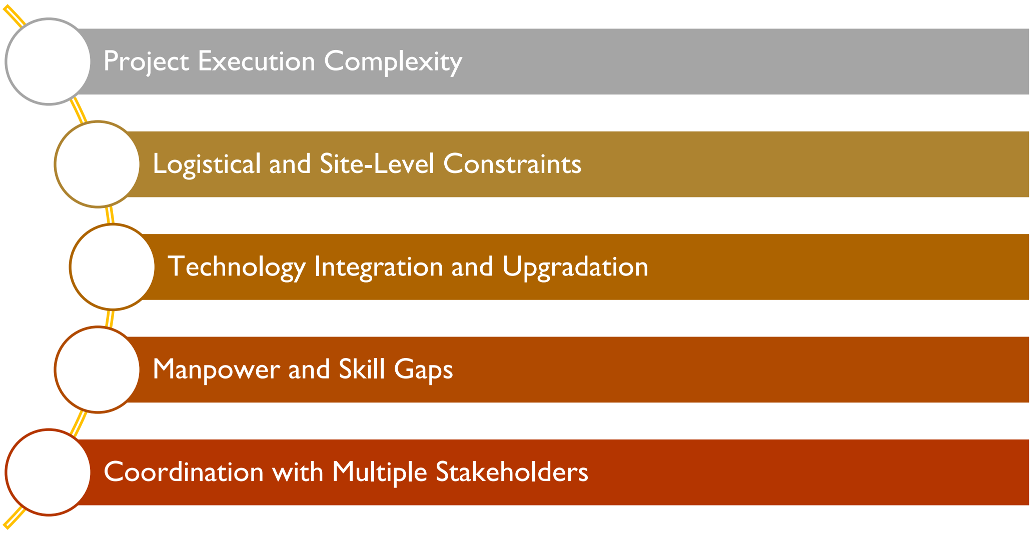
- **Commodity Price Fluctuations:** Commodity Price Fluctuations are a critical threat to EPC contractors, especially in the power sector where infrastructure projects rely heavily on materials like steel, copper, aluminum, and cement. Sudden spikes in global or domestic commodity prices can sharply erode project margins, particularly for fixed-price contracts that do not incorporate robust escalation clauses. EPC firms often operate on thin profit margins and long project cycles, making them vulnerable to such cost shocks. Additionally, geopolitical tensions, supply chain disruptions, and changes in import duties can further amplify input cost volatility. Without adequate hedging or flexible contract structures, contractors may be forced to absorb losses, impacting financial stability and future bidding capacity.

- **Payment Delays from DISCOMs:** Payment Delays from DISCOMs remain a persistent challenge for EPC firms executing power infrastructure projects. Many state-owned distribution companies (DISCOMs) face chronic financial distress due to high Aggregate Technical & Commercial (AT&C) losses, under-recovery of power costs, and inefficiencies in billing and collection. These issues often translate into delayed payments to contractors, even when projects are completed on time. For EPC firms, such delays disrupt working capital cycles, strain liquidity, and increase reliance on short-term borrowing raising overall project risk. Despite government reforms like the RDSS aimed at improving DISCOM performance, payment reliability remains inconsistent across states, posing a material risk to contractors' financial health and operational continuity.

- **Aggressive Bidding Environment:** The EPC power sector in India faces a highly competitive bidding environment, particularly in government tenders and large-scale infrastructure projects. Many players, including newer or financially weaker firms, often bid aggressively sometimes below cost to win contracts. While this helps in acquiring projects, it significantly compresses profit margins and heightens execution risk. Such practices can lead to cost-cutting during implementation, compromising quality, safety, or timelines. In extreme cases, projects may be stalled or abandoned, damaging the reputation of the sector. This also puts pressure on established players to either match low bids or lose market share, thereby affecting industry sustainability.

- **Policy and Fiscal Risks:** Policy and fiscal risks pose a major challenge to EPC firms operating in India's power sector. Sudden changes in tax structures such as revisions in GST rates on solar modules or electrical components can inflate project costs unexpectedly. Similarly, delays in the disbursement of government subsidies or incentives, especially under schemes like PM-KUSUM or rooftop solar programs, can disrupt cash flows and delay project execution. Uncertainty around annual budget allocations or lapses in financial approvals further erode investor confidence. These risks often impact financial modeling and bid pricing, leaving contractors exposed to unforeseen losses and reduced profitability.

Key Challenges:



- **Project Execution Complexity:** Project execution complexity is a fundamental challenge in the power EPC segment, as projects are often spread across remote, diverse, and logistically difficult terrains. Executing infrastructure in such areas demands meticulous planning, coordination with multiple subcontractors, local vendors, and equipment suppliers each with different timelines and capabilities. Additionally, navigating local regulations, securing permits, and dealing with unforeseen ground realities like extreme weather or resistance from local communities further complicate execution. Maintaining quality standards while adhering to strict project timelines in such conditions requires robust project management, technical adaptability, and contingency planning.

- **Logistical and Site-Level Constraints:** Logistical and site-level constraints are a major challenge for EPC projects, especially in the renewable and transmission sectors, which are often located in remote or difficult terrains like deserts, forests, or hilly regions. Transporting large and heavy equipment to these areas requires meticulous planning and reliable infrastructure, which is not always available. Inadequate road access, extreme weather conditions, and long distances from urban supply hubs can delay material delivery and raise transportation costs. Additionally, ensuring timely deployment and accommodation of skilled labor becomes difficult in such locations. These factors not only impact project timelines but also significantly increase execution costs and operational risks.

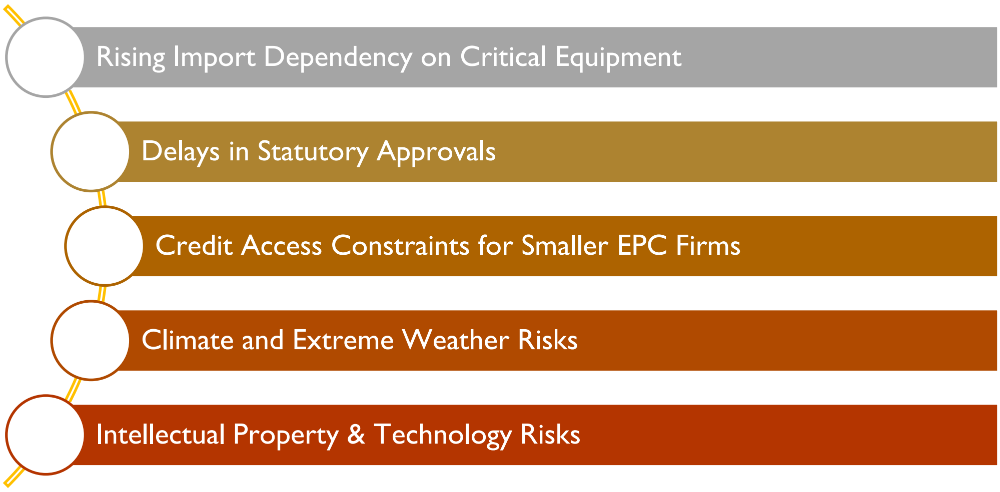
- **Technology Integration and Upgradation:** Technology integration and upgradation have become critical in the evolving power EPC landscape, driven by advancements like smart grids, digital substations, and hybrid renewable systems. EPC firms are now expected to implement sophisticated automation, real-time monitoring, and AI-driven controls to meet new efficiency and reliability benchmarks. However, many smaller or regional EPC players face challenges in adopting these technologies due to limited access to skilled personnel, high capital investment requirements, and lack of in-house R&D capabilities. This technological gap can hinder their competitiveness and limit their participation in high-value, future-ready infrastructure projects.

- **Manpower and Skill Gaps:** Manpower and skill gaps present a persistent challenge for EPC firms operating in the power sector. Projects often require specialized technical personnel for functions like detailed design, site execution, quality assurance, and safety compliance. However, sourcing experienced engineers, supervisors, and skilled technicians especially for remote or infrastructure-deficient sites remains difficult. This shortage can lead to project delays, suboptimal execution, and increased rework. The situation is further compounded by limited training infrastructure and skill development programs tailored to emerging technologies in renewables and smart grid systems, widening the talent gap in the industry.

- **Coordination with Multiple Stakeholders:** Coordination with multiple stakeholders is a critical and often complex aspect of EPC project execution in the power sector. These projects typically involve central agencies like SECI or PGCIL, state utilities, local government bodies, landowners, vendors, and subcontractors all of whom operate under different regulatory frameworks and timelines. Aligning their inputs for approvals, clearances, and execution requires meticulous planning and communication. Delays in any one interface such as delayed permits or material supply can cascade into broader project setbacks. Effective stakeholder management thus demands strong project governance, digital tracking systems, and continuous engagement across all tiers.

Threat & Challenges in the Overall EPC Industry

Threats:



- **Rising Import Dependency on Critical Equipment:** Rising import dependency on critical power infrastructure equipment poses a significant threat to the EPC industry in India. Components such as solar inverters, power transformers, and advanced switchgear are often sourced from countries like China, Germany, and the U.S., making the sector vulnerable to external market dynamics. Any disruption in trade due to geopolitical tensions, global supply chain constraints, or protectionist policies can lead to delays in project execution and increased capital costs. Additionally, fluctuations in foreign exchange rates further impact procurement budgets, especially for fixed-price contracts. This dependence also undermines the government's push for self-reliance under the "Atmanirbhar Bharat" initiative.

- **Delays in Statutory Approvals:** Delays in statutory approvals pose a significant risk to EPC projects in the power infrastructure sector. Projects located near forest areas, coastal regulation zones (CRZ), or defense establishments often require clearances from multiple government bodies such as the Ministry of Environment, Forest and Climate Change (MoEFCC), Ministry of Defence (MoD), or coastal authorities. The bureaucratic nature of these processes, combined with overlapping jurisdiction and lack of streamlined timelines, frequently results in prolonged approval cycles. This leads to project execution delays, higher holding costs, and increased financial exposure for EPC contractors. In some cases, prolonged uncertainty may also result in project cancellation or penalty imposition due to missed deadlines.

- **Credit Access Constraints for Smaller EPC Firms:** Credit access remains a critical constraint for smaller and mid-sized EPC firms in the power infrastructure sector. Due to perceived financial risk and limited credit histories, banks and NBFCs are often reluctant to provide project finance or working capital to these players. This restricts their ability to bid for large-scale tenders that require substantial bank guarantees and performance securities. Even when loans are sanctioned, the interest rates tend to be higher and disbursement slower, impacting cash flow and operational agility. As a result, many capable EPC firms are unable to scale or compete effectively, limiting industry competitiveness and innovation.

- **Climate and Extreme Weather Risks:** Climate change and extreme weather events are emerging as significant risks for EPC firms in the power infrastructure sector. The rising frequency of floods, cyclones, and heatwaves particularly in coastal and arid regions can disrupt construction schedules, damage partially completed assets, and increase downtime. These events not only delay project timelines but also inflate insurance premiums and mitigation costs. Moreover, the unpredictability of weather patterns complicates site planning, logistics, and resource allocation. EPC firms are increasingly required to invest in climate-resilient infrastructure and adaptive project designs, adding to upfront costs and execution complexity.

- **Intellectual Property & Technology Risks:** As digital technologies like SCADA, AI-driven analytics, and remote O&M become integral to power EPC projects, the industry is increasingly exposed to intellectual property (IP) and technology-related risks. Dependence on third-party technology providers can lead to vulnerabilities such as IP disputes, licensing restrictions, and compatibility issues. Additionally, rapid tech evolution risks making proprietary systems or tools obsolete, particularly for firms with limited R&D capacity. Cybersecurity is another concern, as digital platforms handling critical infrastructure data are prone to breaches. These factors pose legal, operational, and reputational risks for EPC companies relying heavily on digital integration.

Challenges:

- **Balancing Standardization with Customization:** In the power EPC space, achieving a balance between standardized designs and client-specific customization is a persistent challenge. While standardization enables cost efficiency, quicker execution, and streamlined procurement, clients often demand modifications tailored to site-specific conditions, regulatory requirements, or unique technical needs. This divergence can lead to repeated design iterations, longer engineering timelines, and increased coordination between design and execution teams. Additionally, in geographically diverse and topographically challenging areas, customization becomes unavoidable, thereby reducing the benefits of economies of scale. Such complexities frequently contribute to delays, cost overruns, and stretched project cycles.

- **Short Bid-to-Award Timelines:** Short bid-to-award timelines in public sector tenders often pressure EPC firms to prepare proposals with minimal due diligence. With limited time to assess site conditions, regulatory requirements, or material costs, firms may make inaccurate assumptions in pricing and planning. This rushed process increases the risk of underbidding, scope misalignment, or overlooking key execution challenges. As a result, project timelines and budgets can be compromised post-award, leading to delays, cost escalations, or strained client relationships. Such time-constrained bidding environments undermine the reliability and financial sustainability of project execution.

- **Post-Commissioning Service Liabilities:** Post-commissioning service liabilities are becoming a significant burden for EPC firms, especially in renewable energy projects where long-term Operation & Maintenance (O&M) commitments and performance guarantees are now standard. These obligations often extend 5-10 years beyond project handover, requiring sustained technical support, spare parts availability, and performance monitoring. However, such responsibilities are not always matched with adequate margins or risk buffers in the contract. Any shortfall in plant performance or service disruptions can lead to penalties, reputational damage, or financial losses making this a critical challenge in the evolving EPC contract landscape.

- **Fragmentation in Subcontracting Ecosystem:** Fragmentation in the subcontracting ecosystem is a persistent challenge for EPC firms in the power infrastructure sector. Projects often rely on multiple subcontractors for specialized tasks such as civil works, electrical installations, and equipment commissioning. Poor coordination among these parties can lead to scheduling conflicts, duplication of effort, and missed deadlines. Additionally, a fragmented vendor base makes it difficult to maintain uniform quality standards and enforce accountability, especially in remote or high-volume project sites. These inefficiencies not only impact project timelines and costs but also pose risks to safety and compliance. Strengthening vendor management systems is essential to address this issue.

Competitive Landscape

The EPC (Engineering, Procurement, and Construction) segment within India's Power Infrastructure domain is undergoing rapid transformation, with increasing private sector participation complementing the long-standing dominance of public sector utilities and large conglomerates. This shift is especially evident in sub-segments such as power transmission lines, substation construction, and switchyard electrification, where execution speed, technical qualification, and cost optimization are critical success factors. Mid-sized EPC players are capitalizing on national programs such as the Green Energy Corridor, RDSS (Revamped Distribution Sector Scheme), and inter-regional grid connectivity upgrades to scale their operations and demonstrate project delivery credentials.

In this space, firms like Rajesh Power Services Limited, Viviana Power Tech Limited, and Advait Energy Transitions Limited are emerging as focused EPC players specializing in transmission and distribution infrastructure.

Company	Years in Operation	Core Focus	Key Capabilities	Project Track Record	Clientele / Market Position
Om Power Transmission Limited (OPTL)	More than 14 years of experience	Transmission & Substation EPC	Transmission line execution (up to 400 kV), substation construction	1,000+ ckm of 66 kV, 800 km of 220 kV, 200 km of 400 kV lines	Strong EPC credentials, established player across transmission domains
Rajesh Power Services Limited (RPSL)	More than 15 years of experience	Power Distribution & Substations	Turnkey EPC for substations (33 kV–400 kV), HT/LT line erection, transformer installation	Multiple projects across Indian states under state DISCOMs & CPSEs (PGCIL, REC)	Recognized for wide geographic execution; often partners as subcontractor
Viviana Power Tech Limited	More than 10 years of experience	Transmission & Distribution EPC	Line construction, substation erection, switchyard works	Regional projects in 132 kV–220 kV range; expanding to 400 kV	Emerging mid-sized player leveraging RDSS & Green Energy Corridor
Advait Energy Transitions Limited	More than 15 years of experience	Renewable-linked T&D EPC	Smart grid integration, modular substations, IoT-based monitoring	Niche projects in renewable evacuation & inter-regional connectivity	Positioned as a digital/clean-energy aligned EPC specialist

The power EPC segment faces stiff competition, especially in the 132kV to 400kV range, where both national players and regional contractors aggressively participate in state and central bidding processes. Tendering norms often include stringent net worth, solvency, and past experience thresholds, which limit first-time entrants and encourage consortium or JV-based bidding strategies. L1 pricing pressures persist, but players differentiate themselves through safety compliance, manpower readiness, and ability to mobilize equipment quickly for geographically diverse projects. Further, In the Transmission EPC Infrastructure industry, order book is the considered an indicator of future performance since it represents a committed portion of anticipated future revenue. Apart from order book, timely completion of project along with quality assurance and cost competitiveness are critical success factor.

Technological capabilities are increasingly central to competitiveness. Players investing in tower erection drones, GIS-based survey mapping, digital twin-enabled project planning, and ERP-linked execution monitoring are better positioned to meet tight commissioning deadlines and handle change orders efficiently. For example, SCADA integration, real-time energy metering, and smart grid controllers are now baseline expectations in distribution EPC. Further, clients increasingly prioritize firms that can deploy pre-fabricated modular substations, remote diagnostic tools, and IoT-based condition monitoring systems, especially for greenfield grid integration projects linked to renewable generation.

In conclusion, the EPC market in India's power infrastructure sector is evolving toward greater specialization, faster execution cycles, and integrated delivery capabilities. While large PSUs and infra conglomerates continue to lead mega-scale projects, players like Rajesh Power Services, Viviana Power Tech, and Advait Energy Transitions are carving out niches by aligning with digitalization trends, regional demand, and clean energy integration. Going forward, companies that can offer a blend of scale, agility, and technical finesse while maintaining robust compliance and safety records are poised to emerge as long-term leaders in the competitive EPC landscape.

Peers Profiling

Rajesh Power Services Limited

Company Overview:

Rajesh Power Services Limited, established in 1971, is an EPC firm focused on turnkey projects in India's HV/EHV transmission and distribution sector. It handles end-to-end services including detailed engineering, procurement, construction, testing and commissioning for underground and overhead transmission lines up to 220 kV and EHV/GIS substations, along with 11 kV urban distribution networks. The company also offers operations and maintenance services, utility services like cable fault location and rectification, transformer retrofitting, cable and equipment testing, third-party inspection, and consultancy.

Product & Service Offerings

- **Turnkey Projects**
- **O&M Services**
- **Utility Services**
- **Cable & Equipment Testing**
- **Design and consultancy**

Key Customer Segments Served

- **State Transmission and Distribution Utilities:** Rajesh Power provides turnkey EPC and consultancy services to state power entities in Gujarat, including GETCO (transmission utility) and DISCOMs such as UGVCL, PGVCL, MGVCL, and DGVCL.
- **Private Power Utilities and Industrial Clients:** The company also collaborates with private-sector power utilities and industrial organizations. Services include execution of EHV infrastructure projects (transmission lines, substations), operations & maintenance, cable testing and fault-location, transformer retrofits, and engineering design all up to 220 kV scale.

Key Strengths

- **Industry Experience:** Over 50 years of presence in the power transmission and distribution sector, executing projects across HV/EHV domains.
- **End-to-End EPC Capabilities:** Single-point responsibility for design, procurement, construction, testing, and commissioning of turnkey projects up to 220 kV.
- **Strong Client Relationships:** Established partnerships with key Gujarat utilities such as GETCO and multiple DISCOMs, built through consistent delivery and trust.
- **Advanced Technical Tools:** Use of equipment like mobile SebaKMT fault-locator systems and cable winch machinery for efficient field service and loss reduction.

Viviana Power Tech Limited

Company Overview:

Viviana Power Tech Limited was founded in 2014 by directors Nikesh Choksi and Richi Choksi to provide turnkey EPC (Engineering, Procurement & Construction) solutions in power transmission, distribution, and industrial projects. Within five years, the company completed approximately 40 contracts worth over INR 40 crore and had ongoing work valuing more than INR 35 crore, encompassing projects such as ±500 kV HVDC systems, 400/220/132/66/33 kV transmission lines and substations for both government utilities and industrial clients. Its scope includes supply, erection, testing and commissioning of all types of electrical systems, supported by a dedicated workforce and partnerships aimed at meeting project timelines and customer expectations.

Product & Service Offerings

- Power Transmission lines
- EHV Substations
- Power Distribution Network Establishment
- Underground Cable Laying
- Modification & Upgradation of Existing Systems

Key Customer Segments Served

- State Government Power Utilities
- Private Power Entities
- Renewable Energy Developers

Key Strengths

- **Founding Vision & Leadership:** Established to meet client needs in power transmission, distribution, and industrial EPC domains with focus and direction from its founders.
- **Project Experience & Scale:** Completed around 40 projects worth over INR 40 crore within five years, with an ongoing order book of approximately INR 35 crore spanning ±500 kV HVDC systems and up to 400/220/132/66/33 kV transmission lines and substations for government and private utilities.
- **Turnkey EPC Delivery:** Offers end-to-end services covering supply, erection, testing, and commissioning of various electrical systems, ensuring full lifecycle support.
- **Dedicated Workforce & Partnerships:** Supported by a committed team, strategic alliances, and internal capabilities aimed at delivering consistent outcomes.

Company Overview:

Advait Energy Transitions Limited, founded in 2010 and headquartered in Ahmedabad, Gujarat, provides end-to-end EPC services and manufacturing for power transmission, substation, and telecommunication infrastructure. Its product range includes stringing tools, OPGW fiber-optic conductors, Aluminum-Clad Steel (ACS) cables, Emergency Restoration Systems (ERS), insulators, and related components, complemented by live-line installation capabilities and turnkey project execution across these domains. In 2023, the company diversified into renewable energy technologies, adding hydrogen electrolyser and fuel cell manufacturing, green hydrogen project EPC, and sustainability advisory services including decarbonization consulting and carbon credit solutions while supporting India's energy transition goals.

Product & Service Offerings

Stringing Tools & Accessories, OPGW Cables (Optical Ground Wire), ACS (Aluminium-Clad Steel) Conductors, Emergency Restoration Systems (ERS), Live-Line OPGW Installation Services, Turnkey EPC for Power & Telecom Infrastructure, Green Hydrogen & Electrolyser Solutions, Battery Energy Storage Systems (BESS).

Key Customer Segments Served

- Power Sector
- Transmission Industry
- Telecommunications Sector
- Green Energy / Renewable Sector

Key Strengths

- **Comprehensive Product & EPC Integration:** Combines manufacturing of critical transmission components such as stringing tools, OPGW, ACS conductors, ERS systems, and insulators with turnkey execution of power transmission, substation, and telecom infrastructure projects.
- **Green Energy & Vertical Integration:** Expanded into green hydrogen and clean energy technologies by manufacturing hydrogen electrolysers, launching fuel cell and BESS solutions, along with EPC services for hydrogen infrastructure.
- **Carbon & Sustainability Advisory Services:** Provides end-to-end carbon credit management, decarbonization strategy consulting, and support for IRECs and global emission standards such as CDM, VERRA, and Gold Standard.

Company Profiling

Om Power Transmission Limited is a Gujarat based Power Transmission and Substation engineering, procurement and construction ("**EPC**") company with extensive experience in delivering high-voltage ("**HV**") and extra-high voltage ("**EHV**") transmission line projects and substations. The company has a track record of more than 14 (Fourteen) years in providing comprehensive solutions in the energy sector, on a turnkey basis for transmission lines, underground cabling, substations, and comprehensive operation and maintenance services. The company has provided EPC services for transmission lines ranging from 11 kilovolts ("**kV**") to 400 kilovolts ("**kV**") and has also undertaken EPC services in relation to substations up to 220kV. Since its inception in 2011, the company has executed over 100 transmission and underground cable line and substation projects, covering more than 1,000 circuit kilometers ("CKM") of transmission lines and 11 substations, encompassing design, engineering, supply, erection, installation, testing, commissioning, obtaining right-of-way (ROW) permissions, and securing all statutory approvals. It received recognition as "Best EPC Company" in 2015–17 at Gujarat Energy Transmission Corporation's Vendor Conference, reflecting its growing reputation within regional transmission circles.

Product & Service Offerings

- **Transmission Lines:** In last three financial years, the company has successfully designed, engineered, and constructed more than 400 CKM of transmission lines spanning voltage levels from 11 kV to 400 kV. The company operates as EPC service provider in the power transmission segment. Transmission lines play a pivotal role in the electricity supply chain as they enable the efficient transfer of bulk power from generation sources, which are often located in remote areas, to substations situated closer to end-users. By operating at high voltages, they minimize energy losses during long-distance transmission, ensuring reliable and cost-effective delivery of electricity. They also provide grid stability by interconnecting different regions, allowing power to be balanced and rerouted in case of shortages or faults. Further, transmission lines are critical for integrating renewable energy projects such as solar and wind, which are typically set up in geographically isolated locations, into the main grid.
- **Underground Cable Projects:** The company undertakes underground cabling projects for high tension ("HT") and low tension ("LT") power systems, providing comprehensive services such as trenching, cable laying, jointing, and termination. Underground Cable Projects is part of transmission infrastructure and are implemented where overhead transmission lines are not feasible due to space constraints or safety concerns. They ensure safe, reliable, and uninterrupted power supply by reducing exposure to environmental factors, minimizing right-of-way issues, and lowering the risk of outages caused by storms, high winds, or other external impacts.
- **Substations:** The company provides end-to-end services for substation projects, encompassing design, supply, erection, testing, commissioning, and civil works for both conventional and renewable energy evacuation substations. It has extensive experience delivering substation EPC solutions ranging from 66

kV to 220 kV. Additionally, they are licensed contractor by GETCO, authorized to execute high-voltage substations up to 220 kV. Under Substation EPC Projects, they provides end-to-end EPC services for commissioning of Substation including Feeder Bay and Capacitor Bay work.

- **Operation and Maintenance:** Om Power Transmission Limited. delivers comprehensive operation and maintenance (O&M) services for substations up to 220 kV and transmission lines, backed by a team of skilled maintenance engineers and proprietary testing equipment. Currently, they have 134 substations under their maintenance, including active contracts for a 132 kV substation and a GIS substation. The company has maintained GETCO substations since 2014, showcasing their ability to support large-scale utilities reliably. They also ensures continuous asset availability and system reliability through preventive and corrective maintenance practices and timely inspections.

Key Customer Segments Served:

- **Power Utilities & Grid Operators:** OPTL undertake large-scale transmission and substation EPC projects for government authorities and state-level utilities, including entities like GETCO and other state electricity boards
- **Renewable Energy Developers & Solar Park Operators:** The company deliver infrastructure services including 220 kV substation EPC projects for renewable energy clients such as K P Energy Limited, aligning with its capability to integrate renewable power into grid networks.
- **Industrial & Corporate Users:** OPTL executes dedicated transmission lines and substations for industrial clients such as their 66 kV EPC work demonstrating work with manufacturing and corporate energy consumers.
- **Transportation & Infrastructure Projects:** The firm has contributed to infrastructure initiatives like the Bullet Train project by NHSRCL, handling complex transmission-line relocations and switching tasks around rail corridors.
- **Operation & Maintenance (O&M) Clients:** OPTL provides long-term O&M services for substations (up to 220 kV) and transmission line systems, supporting both utilities and private clients through maintenance contracts.

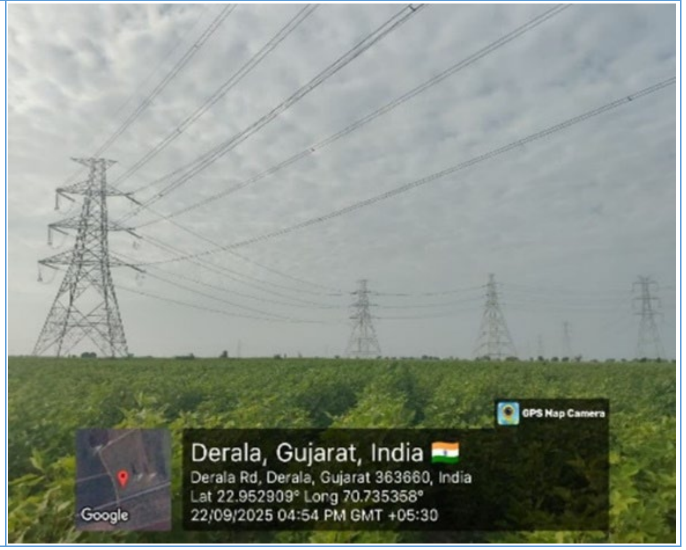
Key Strengths

- **Extensive EPC Experience (Up to 400 kV):** With over two decades in operation, OPTL has successfully executed transmission-line projects up to 400 kV, accumulating more than 1,000 circuit-km of 66 kV, 800 km of 220 kV, and 200 km of 400 kV lines. Their robust EPC capability extends across both transmission and substation domains.

- **Quality-Centric Approach:** OPTL follows rigorous quality control protocols including field quality plans, detailed checklists for civil works, erection, and pre-commissioning, as well as comprehensive testing procedures for electrical equipment to ensure precision and reliability.
- **Timely Delivery Record:** Numerous projects have been completed ahead of schedule, such as a 66 kV line (18 km) in 4 months for One of the customer engaged in automobile industry and a 220 kV line (83 km) ahead of time for GETCO.
- **Complex Engineering & Special Projects:** They have demonstrated capability in executing specialized transmission structures like 36 QD type towers having height of 76.00 meters, each weighing 98.00 MT for 400 kV applications, including challenging crossover of HVDC lines.
- **Operations & Maintenance Expertise:** OPTL provides long-term O&M services for up to 220 kV substations, maintaining around 134 substations as of August 31, 2025.
- **Certified Standards & Compliance:** The company holds ISO 9001:2015 and ISO 14001:2015 certifications, along with OHSAS 18001:2007, underscoring its commitment to quality, environmental responsibility, and safety.

Notable Projects

Name of Project	Brief Description	Image
400KV S/C transmission network for evacuation of 150MW & 100MW (total 250MW) solar power from a solar plant.	The 17.315 km 400 kV transmission line project, completed in just 11 months for a public sector entity engaged in the renewable energy sector in the Kutch region of Gujarat, showcase our project and engineering execution. In addition to the line construction, two 400 kV dwarf towers were erected, designed to facilitate the underneath crossing of a 500 kV HVDC line. These towers, engineered by one of the suppliers engaged in engineering sector, were customized to navigate the challenges posed by the existing high-voltage infrastructure. The project was executed in challenging terrain and environmental conditions, demonstrating our company's ability to meet stringent timelines and overcome technical hurdles while ensuring the reliability and safety of the transmission network.	
Supply, erection testing and commissioning of shifting of various 132KV, 220KV and 400KV transmission lines under Nadiad & Bharuch TR circle on turnkey basis	The project involved the shifting of various transmission lines at 220 kV and 400 kV voltages to facilitate the construction of a bullet train project. This was a critical task as the high-speed bullet train route required rerouting of existing transmission lines to avoid interference with the proposed railway alignment. A total of 36 QD type towers having height of 76.00 meters, each weighing 98.00 MT, were successfully erected as part of the transmission line shifting process. The 400 kV QD-type towers were specially designed to handle the high voltage capacity and were installed with precision to ensure minimal disruption to the grid's stability and functionality.	

Name of Project	Brief Description	Image
Supply, erection, testing & commissioning of 400KV D/C Mundra – Hadala LILO to Halvad line with ACSR twin moose conductor on turnkey basis.	The project involved the supply and erection of the balance work for the 400 KV SC Mundra-Hadala Line of Interconnection (LILO) to Halvad line using ACSR twin moose conductor, covering a length of 44.662 kilometers on a turnkey basis. The project was successfully completed and commissioned on November 25, 2021. The work included supply, erection, testing, and commissioning of transmission line components under a contract awarded by the state-owned transmission utility from Gujarat. The project performance to date has been satisfactory with no abnormalities reported.	

Financial Benchmarking

Sr No	Particulars	Unit	Om Power Transmission Limited For the year and as at				Rajesh Power Services Limited For the year and as at			
			December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023	December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023
GAAP Measures										
1.	Total Income	(₹ in Lakhs)	27,650.19	28,164.77	18,439.45	12,170.73	NA	1,11,466.01	29,506.07	21,117.57
2.	Revenue from Operations	(₹ in Lakhs)	27,454.28	27,943.51	18,276.16	12,023.63	NA	1,10,743.63	28,496.98	20,717.94
3.	Profit After Tax	(₹ in Lakhs)	2,336.80	2,208.48	741.24	623.72	NA	9,336.63	2,601.51	670.28
4.	Operating Cash Flows	(₹ in Lakhs)	(3,738.61)	1,244.61	353.08	1,005.40	NA	-1,628.35	-2,538.43	1,721.87
Non - GAAP Measures										
5.	Gross Profit	(₹ in Lakhs)	6,452.59	7,020.00	4,526.35	3,390.55	NA	21,302.65	7,750.35	4,261.63
6.	Gross Profit Margin	(In %)	23.34%	24.92%	24.55%	27.86%	NA	19.11%	26.27%	20.18%
7.	PAT Margin	(In %)	8.45%	7.84%	4.02%	5.12%	NA	8.38%	8.82%	3.17%
8.	CFO/EBITDA	(In Times)	(1.09)	0.35	0.24	0.84	NA	-0.12	-0.75	1.23
9.	Debt to Equity Ratio	(In Times)	0.32	0.26	0.52	0.59	NA	0.21	0.92	1.02
10.	Current Ratio	(In Times)	1.86	1.81	1.34	1.26	NA	1.58	2.09	1.71
11.	EBITDA	(₹ in Lakhs)	3,424.45	3,565.60	1,446.63	1,192.94	NA	13,374.68	3,395.59	1,400.84
12.	EBITDA Margin	(In %)	12.38%	12.66%	7.85%	9.80%	NA	12.00%	11.51%	6.63%
13.	Return on Equity (RoE)	(In %)	24.28%	35.83%	15.77%	15.18%	NA	53.69%	36.39%	12.08%
14.	Return on Capital Employed (RoCE)	(In %)	26.53%	41.76%	18.41%	15.45%	NA	55.46%	23.61%	11.18%
15.	Net Capital Turnover Ratio	(In Times)	2.62	4.57	4.29	3.11	NA	8.27	2.59	2.29
Operational Metrics										
16.	Order Book	(₹ in Lakhs)	74,460.27	44,168.85	51,560.95	20,989.09	NA	362800	235817	NA

Sr No	Particulars	Unit	Om Power Transmission Limited For the year and as at				Rajesh Power Services Limited For the year and as at			
			December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023	December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023
17.	Order Inflow	(₹ in Lakhs)	56,335.07	21,452.77	49,446.74	10,468.65	NA	NA	NA	NA
18.	Number of Projects Completed	(In Numbers)	15	26	11	25	NA	NA	NA	NA
19.	Number of Projects ongoing	(In Numbers)	58	42	48	36	NA	NA	NA	NA
20.	Number of Customers	(In Numbers)	17	24	18	17	NA	NA	NA	NA
21.	Book to Bill Ratio	(In Times)	2.71	1.58	2.82	1.75	NA	3.28	8.28	NA
22.	Project Win Rate	(In %)	35.71%	40.58%	43.75%	46.05%	NA	NA	NA	NA

Source: All the financial information for listed industry peers mentioned above is on consolidated basis and is sourced from the annual reports as available on website of the company and BSE and NSE for the Financial Year ending March 31, 2023, March 31, 2024 and March 31, 2025. For Rajesh Power Services Limited, December 31, 2025, financial information is not available hence, the same has been disclosed as NA.

Sr No	Particulars	Unit	Om Power Transmission Limited For the year and as at				Advait Energy Transitions Limited For the year and as at			
			December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023	December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023
GAAP Measures										
1.	Total Income	(₹ in Lakhs)	27,650.19	28,164.77	18,439.45	12,170.73	49,563.13	40,646.02	21,172.34	10,593.14
2.	Revenue from Operations	(₹ in Lakhs)	27,454.28	27,943.51	18,276.16	12,023.63	48,632.76	39,910.91	20,884.61	10,419.38
3.	Profit After Tax	(₹ in Lakhs)	2,336.80	2,208.48	741.24	623.72	3,650.39	3,205.35	2,188.00	843.95
4.	Operating Cash Flows	(₹ in Lakhs)	(3,738.61)	1,244.61	353.08	1,005.40	NA	4,647.38	(936.80)	1,275.47
Non - GAAP Measures										
5.	Gross Profit	(₹ in Lakhs)	6,452.59	7,020.00	4,526.35	3,390.55	8,834.27	8,902.41	6,289.28	3,080.65
6.	Gross Profit Margin	(In %)	23.34%	24.92%	24.55%	27.86%	17.82%	21.90%	29.71%	29.08%
7.	PAT Margin	(In %)	8.45%	7.84%	4.02%	5.12%	7.37%	7.89%	10.33%	7.97%
8.	CFO/EBITDA	(In Times)	(1.09)	0.35	0.24	0.84	NA	0.92	(0.26)	0.77
9.	Debt to Equity Ratio	(In Times)	0.32	0.26	0.52	0.59	NA	0.24	0.72	0.33
10.	Current Ratio	(In Times)	1.86	1.81	1.34	1.26	NA	1.72	1.29	1.15
11.	EBITDA	(₹ in Lakhs)	3,424.45	3,565.60	1,446.63	1,192.94	5,522.02	5,056.34	3,614.76	1,658.00
12.	EBITDA Margin	(In %)	12.38%	12.66%	7.85%	9.80%	11.14%	12.44%	17.07%	15.65%
13.	Return on Equity (RoE)	(In %)	24.28%	35.83%	15.77%	15.18%	NA	23.71%	36.69%	20.43%
14.	Return on Capital Employed (RoCE)	(In %)	26.53%	41.76%	18.41%	15.45%	NA	25.38%	35.50%	24.14%
15.	Net Capital Turnover Ratio	(In Times)	2.62	4.57	4.29	3.11	NA	3.06	4.35	7.73
Operational Metrics										
16.	Order Book	(₹ in Lakhs)	74,460.27	44,168.85	51,560.95	20,989.09	104800.00	50380.00	20470.00	16200.00
17.	Order Inflow	(₹ in Lakhs)	56,335.07	21,452.77	49,446.74	10,468.65	NA	NA	NA	NA

Sr No	Particulars	Unit	Om Power Transmission Limited For the year and as at				Advait Energy Transitions Limited For the year and as at			
			December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023	December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023
18.	Number of Projects Completed	(In Numbers)	15	26	11	25	NA	NA	NA	NA
19.	Number of Projects ongoing	(In Numbers)	58	42	48	36	NA	NA	NA	NA
20.	Number of Customers	(In Numbers)	17	24	18	17	NA	NA	NA	NA
21.	Book to Bill Ratio	(In Times)	2.71	1.58	2.82	1.75	2.15	1.26	0.98	1.55
22.	Project Win Rate	(In %)	35.71%	40.58%	43.75%	46.05%	NA	NA	NA	NA

Source: All the financial information for listed industry peers mentioned above is on consolidated basis and is sourced from the annual reports as available on website of the company and BSE and NSE for the nine-months period ended December 31, 2025 and for the Financial Year ending March 31, 2023, March 31, 2024 and March 31, 2025. Some of the operational metrics which are not available in the public domain are disclosed as NA

Sr No	Particulars	Unit	Om Power Transmission Limited For the year and as at December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023	Viviana Power Tech Limited For the year and as at December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023
GAAP Measures										
1.	Total Income	(₹ in Lakhs)	27,650.19	28,164.77	18,439.45	12,170.73	20,984.28	21,959.29	6,580.19	3,625.01
2.	Revenue from Operations	(₹ in Lakhs)	27,454.28	27,943.51	18,276.16	12,023.63	20,849.81	21,896.15	6,552.91	3,615.17
3.	Profit After Tax	(₹ in Lakhs)	2,336.80	2,208.48	741.24	623.72	1,710.68	2,068.52	654.61	300.88
4.	Operating Cash Flows	(₹ in Lakhs)	(3,738.61)	1,244.61	353.08	1,005.40	-296.11	-1,411.38	-295.90	-1,145.56
Non - GAAP Measures										
5.	Gross Profit	(₹ in Lakhs)	6,452.59	7,020.00	4,526.35	3,390.55	10,024.43	8,372.83	3,198.44	2,574.42
6.	Gross Profit Margin	(In %)	23.34%	24.92%	24.55%	27.86%	47.77%	38.13%	48.61%	71.02%
7.	PAT Margin	(In %)	8.45%	7.84%	4.02%	5.12%	8.15%	9.42%	9.95%	8.30%
8.	CFO/EBITDA	(In Times)	(1.09)	0.35	0.24	0.84	-0.09	-0.44	-0.26	-2.22
9.	Debt to Equity Ratio	(In Times)	0.32	0.26	0.52	0.59	0.93	0.86	0.68	0.56
10.	Current Ratio	(In Times)	1.86	1.81	1.34	1.26	0.99	1.01	1.42	1.87
11.	EBITDA	(₹ in Lakhs)	3,424.45	3,565.60	1,446.63	1,192.94	3,169.16	3,218.22	1,158.22	516.07
12.	EBITDA Margin	(In %)	12.38%	12.66%	7.85%	9.80%	15.10%	14.66%	17.60%	14.24%
13.	Return on Equity (RoE)	(In %)	24.28%	35.83%	15.77%	15.18%	25.18%	49.15%	30.85%	24.33%
14.	Return on Capital Employed (RoCE)	(In %)	26.53%	41.76%	18.41%	15.45%	24.89%	42.84%	32.88%	24.05%
15.	Net Capital Turnover Ratio	(In Times)	2.62	4.57	4.29	3.11	4.13	6.55	2.86	2.90
Operational Metrics										
16.	Order Book	(₹ in Lakhs)	74,460.27	44,168.85	51,560.95	20,989.09	NA	N A	N A	N A
17.	Order Inflow	(₹ in Lakhs)	56,335.07	21,452.77	49,446.74	10,468.65	NA	N A	N A	N A

Sr No	Particulars	Unit	Om Power Transmission Limited For the year and as at				Viviana Power Tech Limited For the year and as at			
			December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023	December 31, 2025	March 31, 2025	March 31, 2024	March 31, 2023
18.	Number of Projects Completed	(In Numbers)	15	26	11	25	NA	NA	NA	NA
19.	Number of Projects ongoing	(In Numbers)	58	42	48	36	NA	NA	NA	NA
20.	Number of Customers	(In Numbers)	17	24	18	17	NA	NA	NA	NA
21.	Book to Bill Ratio	(In Times)	2.71	1.58	2.82	1.75	NA	NA	NA	NA
22.	Project Win Rate	(In %)	35.71%	40.58%	43.75%	46.05%	NA	NA	NA	NA

Source: All the financial information for listed industry peers mentioned above is on consolidated basis and is sourced from the annual reports as available on website of the company and BSE and NSE for the nine-months period ended December 31, 2025 and for the Financial Year ending March 31, 2023, March 31, 2024 and March 31, 2025. Some of the operational metrics which are not available in the public domain are disclosed as NA

Sr No.	Metric	Unit	Formula
1.	Total Income	(₹ in Lakhs)	Sum of revenue from operations and other income.
2.	Revenue from Operations	(₹ in Lakhs)	Sum of revenue from customers and other operating income.
3.	Profit After Tax	(₹ in Lakhs)	Restated profit for the year as per Restated Financial Statements.
4.	Operating Cash Flows	(₹ in Lakhs)	Operating Cash flows is Cash flow from operations from cash flow statements.
5.	Gross Profit	(₹ in Lakhs)	Gross profit is calculated by deducting the cost of material consumed & project related expenses from the restated revenue from operations.
6.	Gross Profit Margin	(In %)	Gross Profit Margin is calculated by dividing gross profit by revenue from operation and multiplying by 100
7.	PAT Margin	(In %)	PAT Margin (%) is determined by dividing the restated profit for the year by total income and multiplying by 100.
8.	CFO/EBITDA	(In Times)	Cash flow from operation divided by EBITDA
9.	Debt to Equity Ratio	(In Times)	This is defined as total debt divided by total equity. Total debt is the sum of total current & non-current borrowings; total equity means sum of equity share capital and other equity
10.	Current Ratio	(In Times)	Current Ratio is calculated by total current assets divided by total current liabilities.
11.	EBITDA	(₹ in Lakhs)	EBITDA is calculated as Restated profit before share of profit/(loss) tax plus Finance Costs, Depreciation and amortization expense less other income.
12.	EBITDA Margin	(In %)	EBITDA Margin (%) is computed by dividing EBITDA by revenue from operation and multiplying by 100
13.	Return on Equity (RoE)	(In %)	Return on Equity (%) is calculated by dividing profit after tax (PAT) by average shareholder fund and multiplying by 100.
14.	Return on Capital Employed (RoCE)	(In %)	ROCE is calculated as operating EBIT as a percentage of capital employed. EBIT is calculated as Restated profit before share of profit/(loss) tax plus Finance Costs. Capital employed is the sum of tangible net worth plus net debt, where tangible net worth is calculated as total equity minus goodwill, intangible assets, and deferred tax assets, plus deferred tax liabilities.

Sr No.	Metric	Unit	Formula
15.	Net Capital Turnover Ratio	(In Times)	Net capital turnover ratio is calculated by dividing net sales by average working capital. Net sales are total sales minus sales returns, and working capital is calculated as current assets minus current liabilities (excluding short-term borrowings).
16.	Order Book	(₹ in Lakhs)	The order book indicates the estimated billing from the unexecuted portions of all existing contracts of the company as of a specific date.
17.	Order Inflow	(₹ in Lakhs)	Order inflow represents the total value of new customer orders received by the company within a specific period.
18.	Number of Projects Completed	(In Numbers)	This metric refers to the total count of projects that have been fully completed and delivered within a specified time frame
19.	Number of Projects ongoing	(In Numbers)	Number of Ongoing Projects represents the total projects that are active and not yet completed during a specific period. It is calculated by counting all projects in execution, excluding those closed or fully delivered.
20.	Number of Customers	(In Numbers)	Number of Customers represents total number of unique customers served in respective period.
21.	Book to Bill Ratio	(In Times)	The book-to-bill ratio is the ratio of the total value of new orders received (bookings) to the total value of orders shipped and billed in the same period.
22.	Project Win Rate	(In %)	The project win rate (%) is the percentage of projects successfully secured out of the total number of project opportunities pursued.