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Capex & Currents: INR 65 Trillion Capex to Electrify India-2035

INR 65-70 Trillion Investment Needed to Power India's 4 Trillion-Unit Electricity Future by 2035

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Capex and Currents: INR 65 Trillion Capex to Electrify India-2035

GROWTH VECTOR: POWER

Estimated addition in capacities from 2025 to 2035-

Solar: +458 GW

Wind: +231 GW

Coal: +108 GW

Large-Hydro: +51 GW

Nuclear: +30 GW

~INR 65-70 Tn Investment Needed to Fuel India's 4 Trillion-Unit Electricity Future

India's electricity demand is projected to triple by 2035, reaching over 4,000 TWh, driven by industrial expansion, urbanization, digital infrastructure, and the electrification of transport. Meeting this surge will require a massive scale-up in generation capacity across renewables like Solar and Wind, thermal, and nuclear, alongside robust transmission and distribution upgrades. This report outlines the estimated capital investment needed to build a resilient, sustainable, and future-ready power ecosystem.

Here are key pointers from our analysis:

- India to potentially add 850-900 GW of new Power capacity by 2035 reaching 1,300-1,400 GW in total.
- This energy transition likely demands Rs 65–70 trillion investment, with Rs 15 trillion wired into transmission grids and smart meters.
- Solar is likely to lead India's energy mix by 2035 with 564 GW capacity, growing 5x from 2025 and generating nearly 1,000 BU annually, requiring ~Rs 23 trillion in Capex.
- Wind capacity likely to grow 5.5x to ~280 GW by 2035, generating ~600 BU & requiring Rs 11.5 trillion in capex
- Coal's capacity projected to drop to 24% by 2035, but still generating 45% of power with ~1,900 BU output and requiring Rs 9 trillion investments.

"India's energy transition presents one of the largest infrastructure investment opportunities globally."

**For Illustrative Purposes Only*

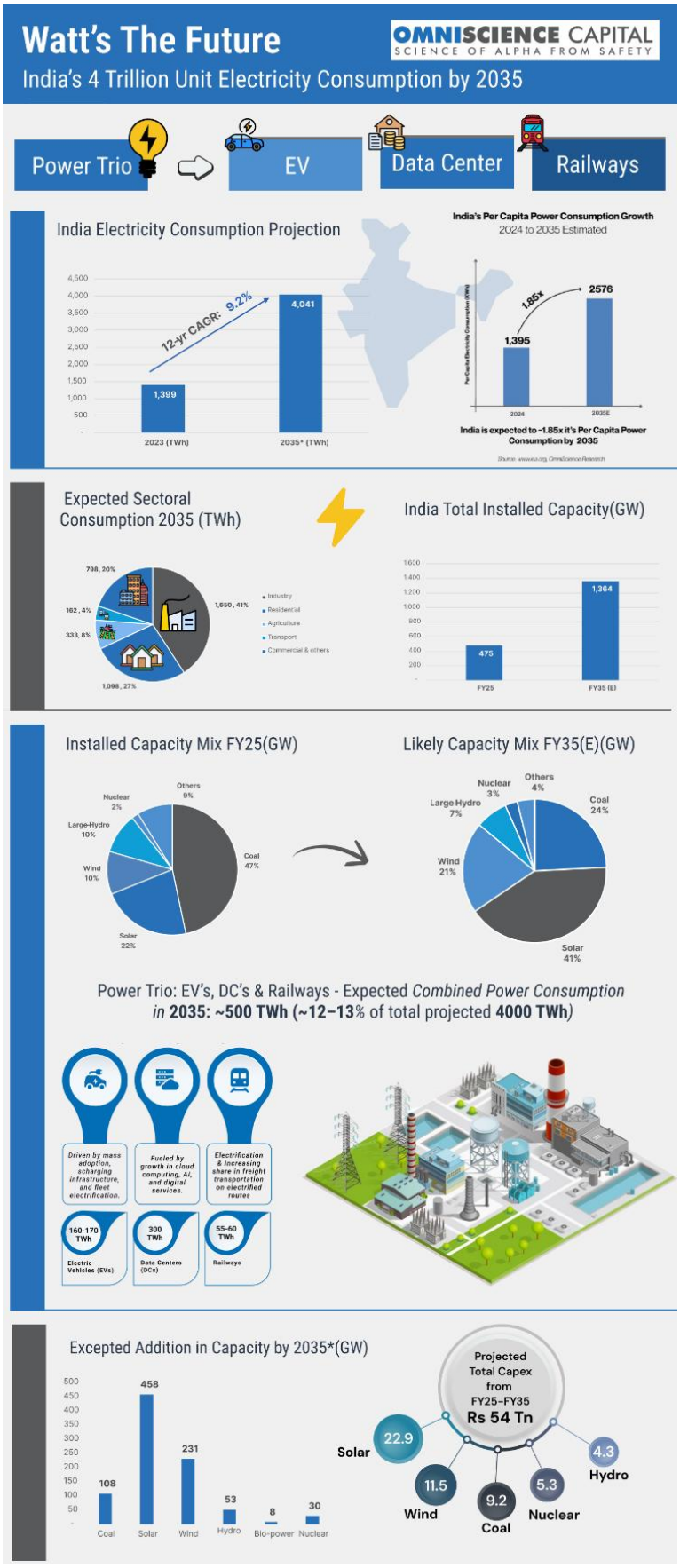

Exhibit 1: Projected Electricity Landscape of India by 2035

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Renewables by 2035: 70% of Installed Capacity, 47% of Generation

To estimate India's power capacity mix for FY2035, we referred to the Central Electricity Authority's Draft National Electricity Plan (NEP), which outlines the targeted capacity mix for 2032. We used the 2032 mix as a benchmark and extended our own projections done in previous power report till 2030 to 2035 (read here...), incorporating adjustments to reflect evolving sectoral trends, policy momentum, and anticipated technological advancements.

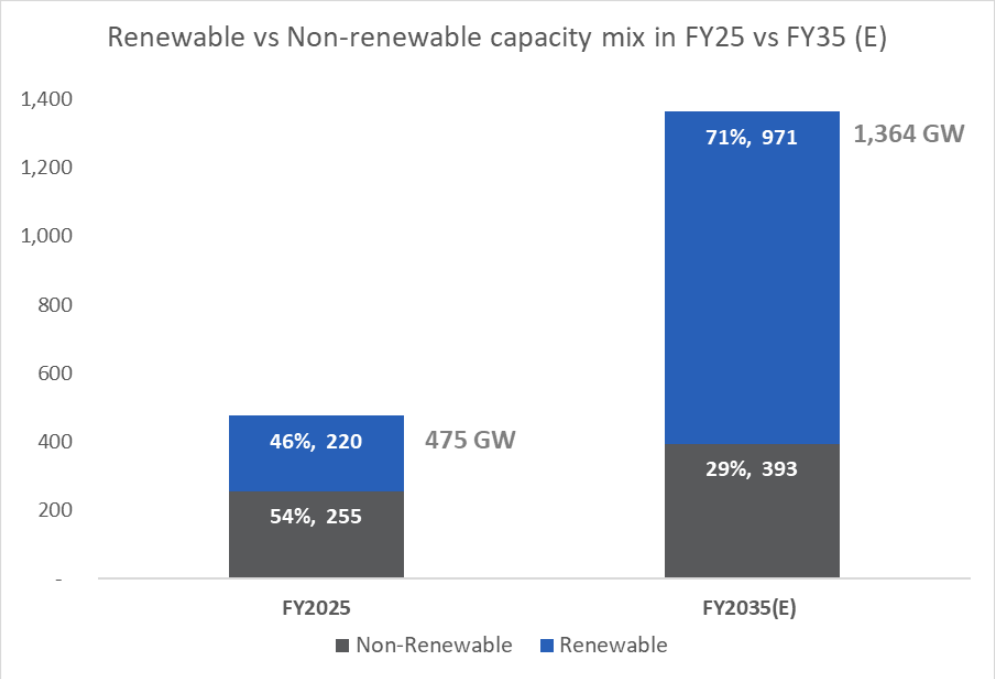

Exhibit 2: Capacity-mix comparison of Renewables & Non-renewables in FY25 vs FY35 (Estimated)

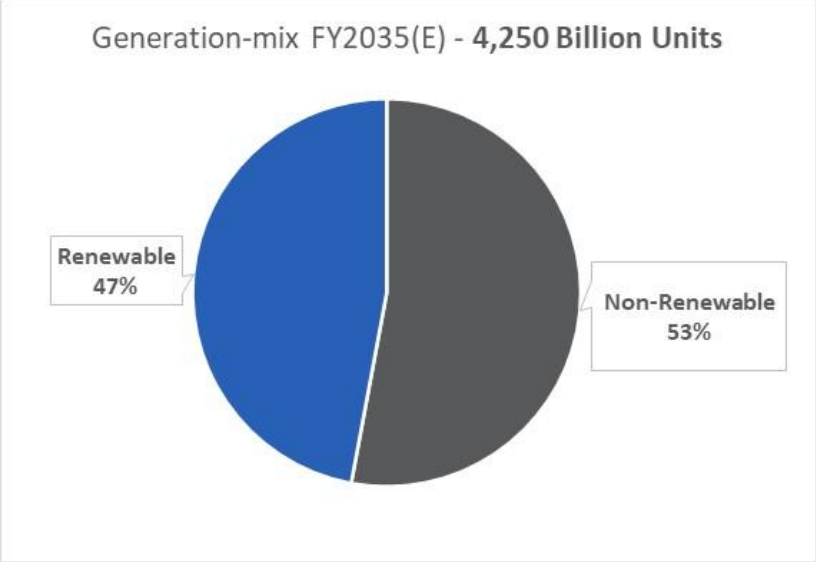

Exhibit 3: 47% of the total electricity generation is likely to be from Renewable sources in FY2035

Wind-ing down Coal for a Sunnier Tomorrow

Solar and Wind likely to capture ~40% and ~20% of the Total Grid respectively

Alignment with CEA's Draft National Electricity Plan (NEP) 2032 Targets:

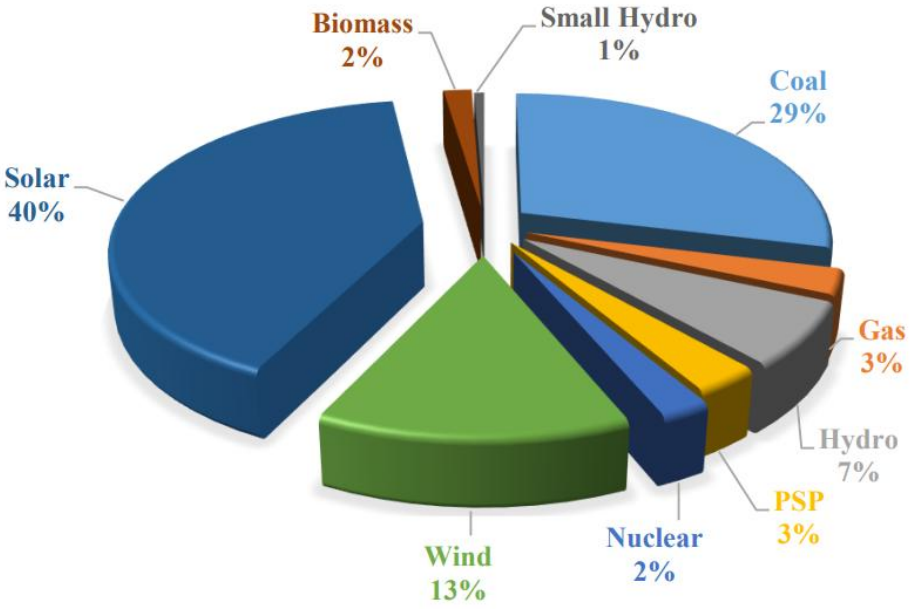

Exhibit 4: All India Installed generating Capacity likely by 2031-32 according to CEA's Draft NEP

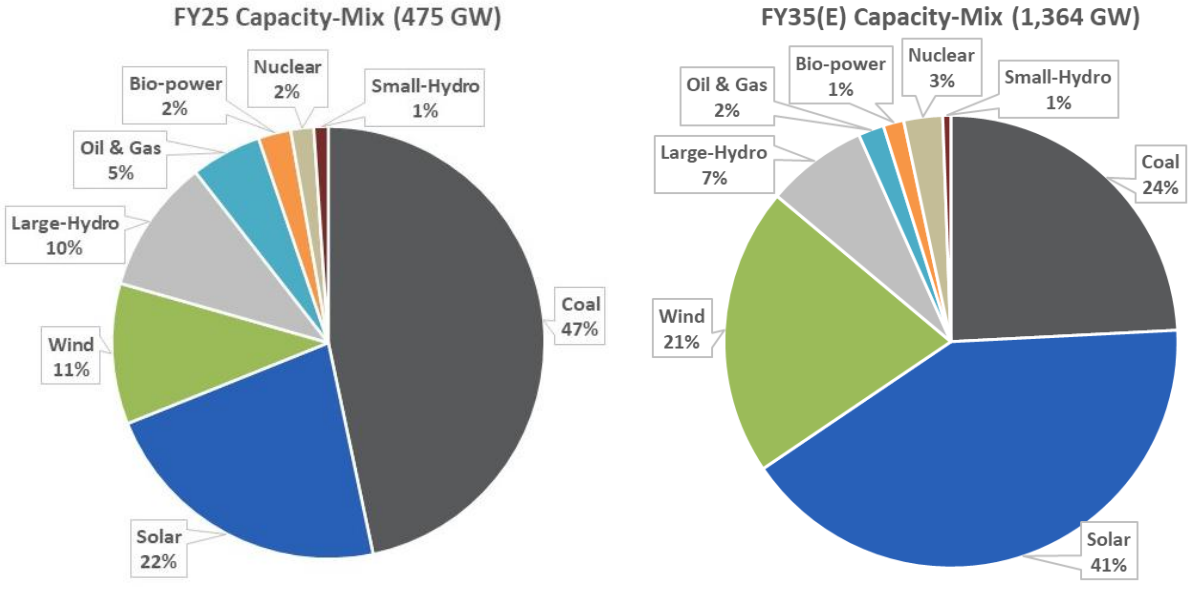

Exhibit 5: Projected Power Capacity-Mix in FY2035 as compared to current FY2025 mix, Omniscience Research

Our projected capacity mix for FY2035 closely aligns with the targets outlined in the Draft National Electricity Plan (NEP) 2032, reinforcing the policy consistency of our estimates.

According to the NEP, solar is expected to contribute 40% of India's installed capacity by 2032—a figure we project to slightly increase to 41% by 2035, reflecting continued momentum in solar deployment. Coal's share, which NEP estimates at 29% by 2032, is projected to decline further to 24% by 2035 in our analysis, consistent with India's decarbonization goals and the growing dominance of renewables.

Wind energy, which NEP places at 13%, is expected to rise significantly to 21% by 2035, capturing a portion of coal's declining share and contributing to grid diversification. Other sources such as hydro, nuclear, and biomass remain relatively stable in both projections, supporting baseload and regional reliability. This alignment with NEP validates our methodology and also highlights the strategic direction India is taking toward a cleaner, more balanced energy future.

The growth rates of capacity addition assumed from FY30 to FY35 compared with the growth rates assumed from FY24 to FY30 are as follows:

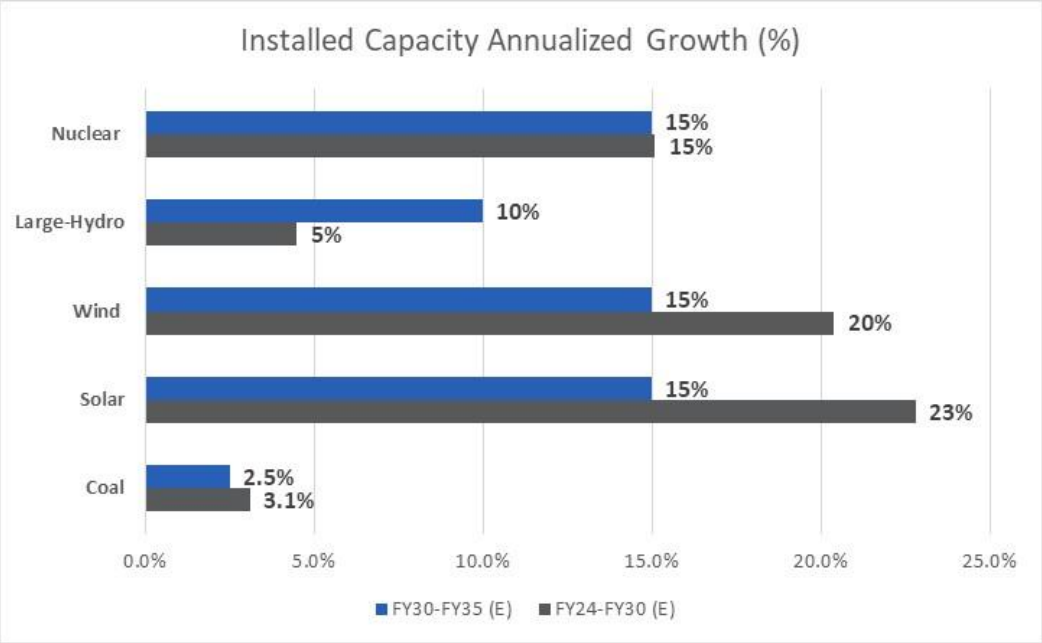

Exhibit 6: Assumed growth rates in capacity addition from FY24-FY30 & FY30-FY35

Battery Energy Storage Systems (BESS) to drive higher plant efficiency for renewables

Our PLF estimates for 2035 are grounded in historical performance data over the past decade, while also factoring in expected technological advancements and grid enhancements.

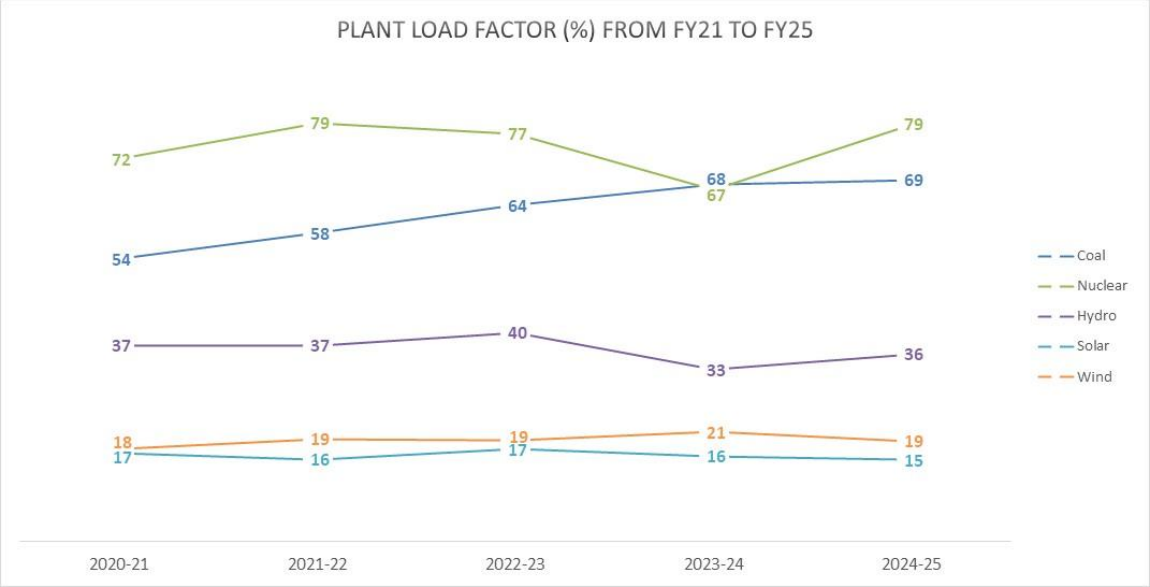

Exhibit 7: Historical Plant Load Factor for major sources from 2021 to 2025

Renewables like solar and wind have historically operated at lower capacity utilization factors—averaging 15% and 18% respectively. However, with the integration of Battery Energy Storage Systems (BESS) and improved forecasting, we expect modest PLF improvements to 20% for solar and 25% for wind by 2035.

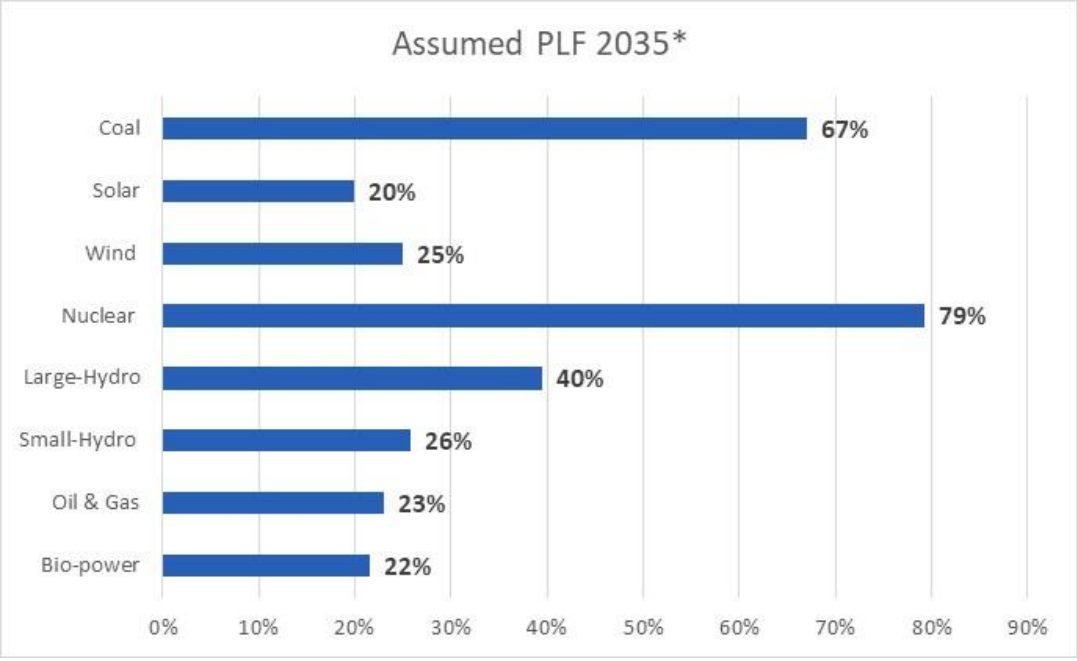

Exhibit 8: Likely PLFs for different sources by 2035 due to technological improvements

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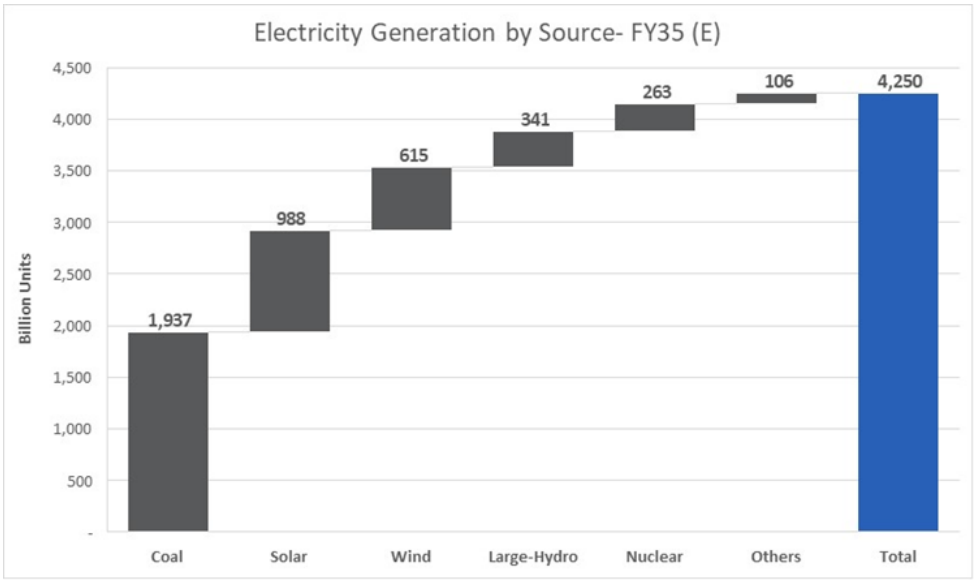
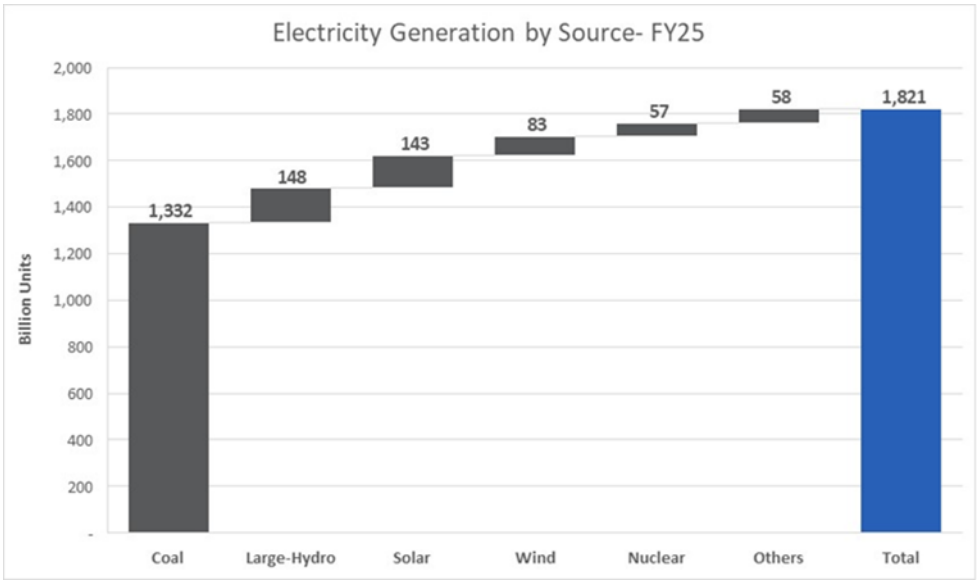
Coal Paradox: Declining Share, Dominant Output

From the projected capacities and assumed PLFs in 2035, we get the electricity generation in Billion Units from each sources as:



Coal:	46%
Solar:	23%
Wind:	14%
Large-Hydro:	8%
Nuclear:	6%
Others:	3%

Exhibit 9: Electricity generation from each source as projected using Capacity & PLF assumptions of 2035



Coal:	73%
Solar:	8%
Wind:	5%
Large-Hydro:	8%
Nuclear:	3%
Others:	3%

Exhibit 10: Electricity generation from each source in FY25

India's projected electricity generation for FY35 reveals a strategic shift toward a more diversified and sustainable energy mix. While coal remains the dominant source with 1,937 billion units- accounting for nearly 46% of the total 4,250 billion units- renewables are making significant inroads. Solar power is set to contribute 988 billion units, making it the second-largest source, followed by wind at 615 billion units. Together, solar and wind will supply over 38% of the total generation, underscoring India's commitment to clean energy.

Large-hydro and nuclear sources are expected to generate 341 and 263 billion units respectively, while other sources will contribute 106 billion units. This balanced approach reflects a transition strategy that maintains energy security through coal and nuclear, while aggressively expanding renewable capacity to meet future demand and climate goals.

INR 54 Tn Power Push for Capacity: Solar and Wind Lead India's Energy Investment Race

India's planned capacity expansion for its power sector by 2035 totals 889 GW, with a clear emphasis on renewable energy sources. Solar power leads the mix with a massive 458 GW, accounting for over half of the total new capacity. Wind energy follows with 231 GW, reinforcing the country's push toward clean and sustainable power generation. Coal, while still significant, adds 108 GW—reflecting a strategic but reduced role in the future energy landscape.

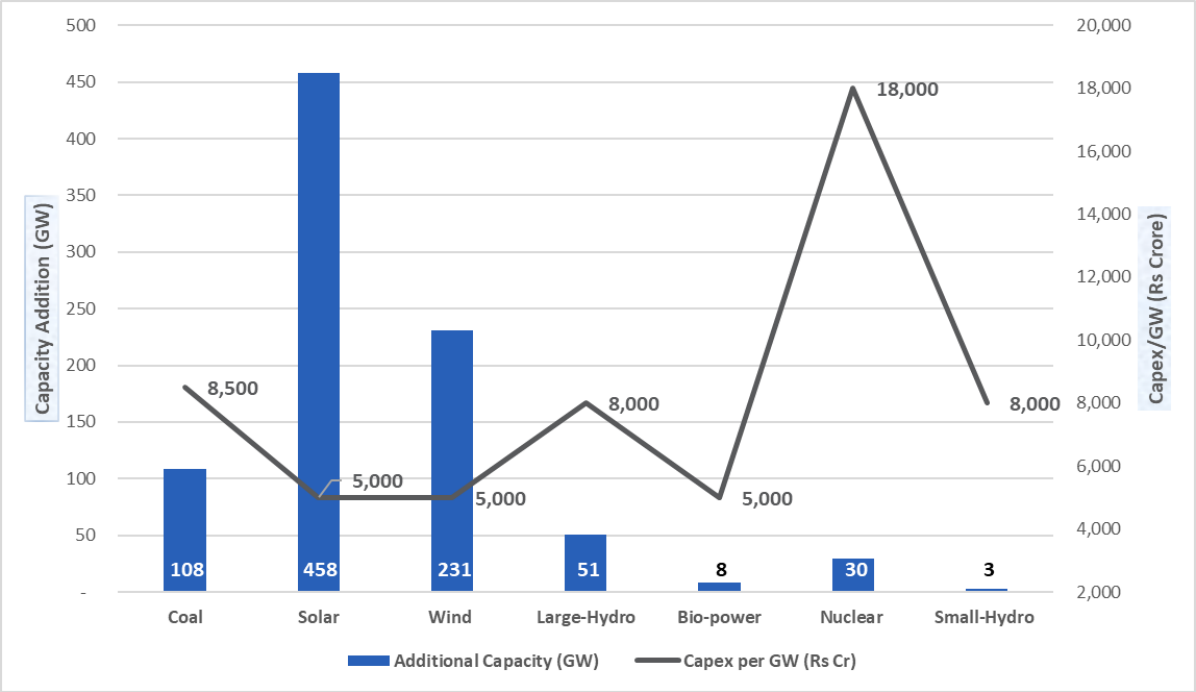


Exhibit 11: Expected capacity addition and capex/GW required for each power source by 2035

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Solar accounts for over 42% of the total investment

India's energy transition from FY25 to FY35 is set to be backed by a massive Rs 54 trillion in capital expenditure, with solar power commanding the lion's share. At Rs 23 trillion, solar accounts for over 42% of the total investment, driven by its expansive 458 GW capacity addition at a relatively low Rs 5,000 crore per GW. Wind follows with Rs 11.5 trillion, reinforcing the dominance of renewables in the investment landscape.

Coal will see an additional capacity expansion of 108 GW, demanding Rs 9.2 trillion- highlighting its continued role in base-load generation. Nuclear energy, though contributing just 30 GW, requires Rs 5.3 trillion due to its high Rs 18,000 crore per GW cost, making it the most capital-intensive source.

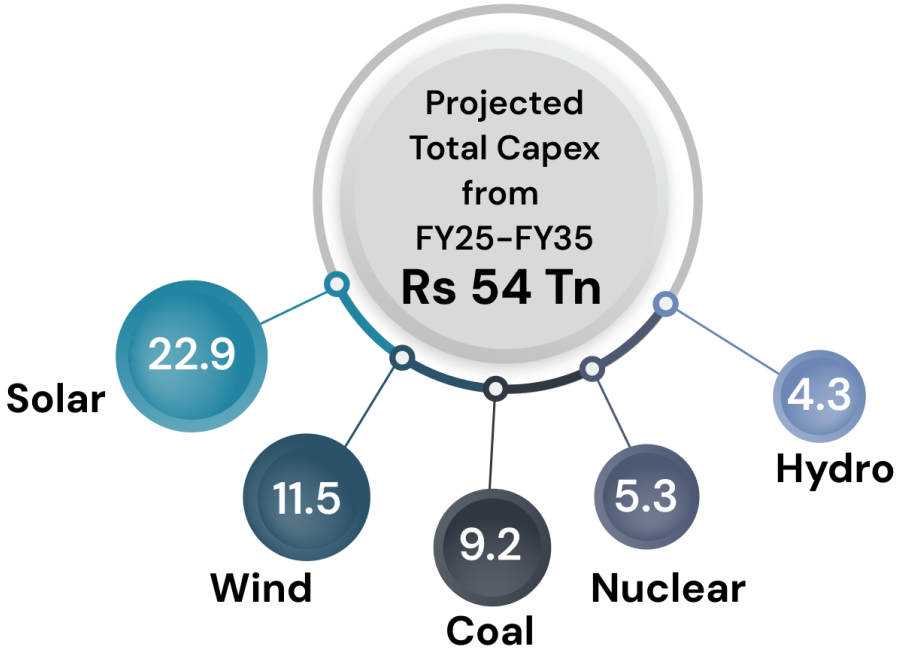

Exhibit 12: Source-wise estimated capex requirement in capacity addition from 2025-2035

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From Capacity to Connectivity: India's Transmission will likely demand Rs 13 Trillion by 2035

India's ambitious power expansion plan hinges not only on generation capacity but also on a robust transmission backbone. According to the Ministry of Power, the country aims to invest Rs 9.2 trillion in transmission infrastructure by 2032, expanding the network from 4.85 lakh circuit kilometres (cKm) in 2024 to 6.48 lakh cKm. This 1.63 lakh cKm addition is aligned with a doubling of generation capacity, ensuring that power reaches every corner of the country efficiently.

However, as per our analysis, with the projected capacity growth reaching 2.9x the current level by 2035, the transmission requirement scales up to 2.3 lakh cKm- demanding a total capex of **Rs 13 trillion**. This underscores the critical need for accelerated investment and planning in grid infrastructure to support India's renewable-heavy energy future. The transmission sector will play a pivotal role in integrating solar, wind, and other sources into the national grid, making it the backbone of India's energy transition.

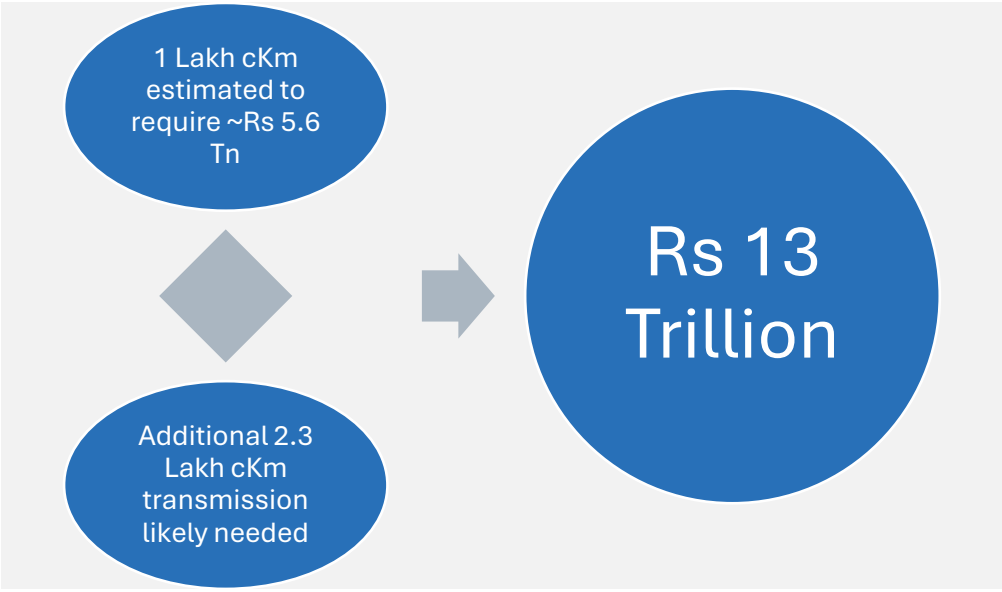


Exhibit 13: Estimated capex required in transmission infrastructure from 2025-2035

**For Illustrative Purposes Only*

Smart Spending: Rs 1.3 Trillion Needed to Digitize India's Power Meters by 2035

Govt. of India has launched Revamped Distribution Sector Scheme (RDSS) with an outlay of Rs. 3,03,758 crores with an estimated Gross Budgetary Support of Rs. 97,631 crores (Smart Meter). The scheme aims to reduce the AT&C losses to PAN India levels of 12-15%.

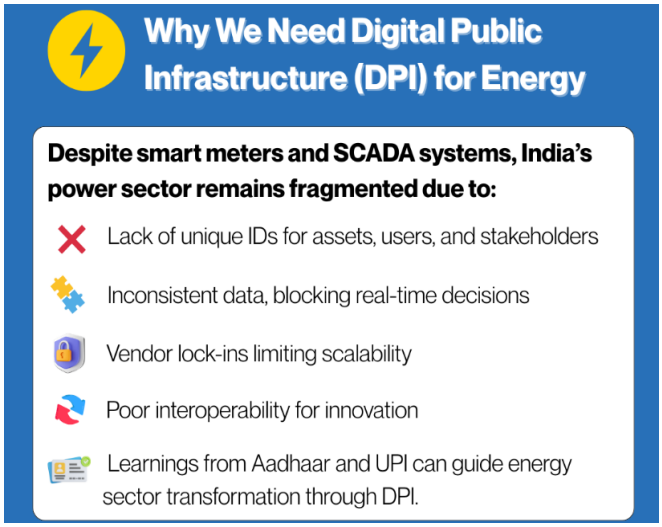
Part-A of the scheme includes upgradation of distribution infrastructure and Pre-paid Smart Metering & System Metering. The envisaged investment outlay for the installation of 25 crore smart meters is ~Rs. 1.1 lakh crore. (CARE Report)

India has roughly around 30 Cr households, which is expected to increase in future. If we assume 30 Crore smart meters in 2035, the envisaged capex required will be around **1.3 trillion**.

As part of the broader Rs 65-70 trillion capex planned for the power sector, this investment in metering infrastructure is relatively modest but strategically vital.

India Energy Stack: Digital Backbone for India's Power Sector

The Ministry of Power has launched a task force to develop the India Energy Stack (IES) — a unified, secure, and interoperable digital infrastructure for the energy sector. IES aims to overcome fragmented systems by creating a standardized Digital Public Infrastructure (DPI) to manage and innovate across the electricity value chain.



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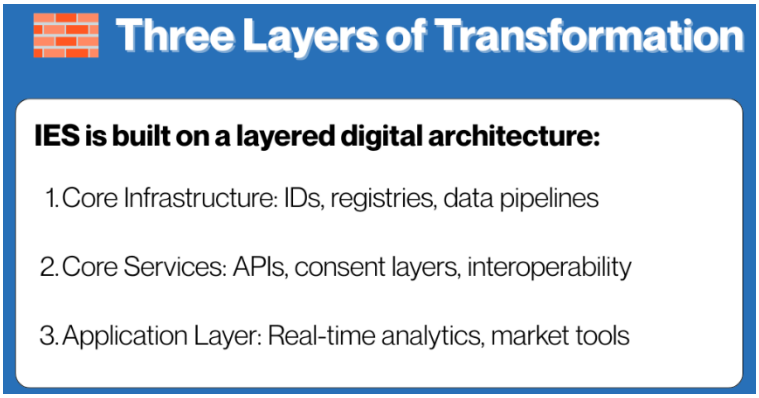
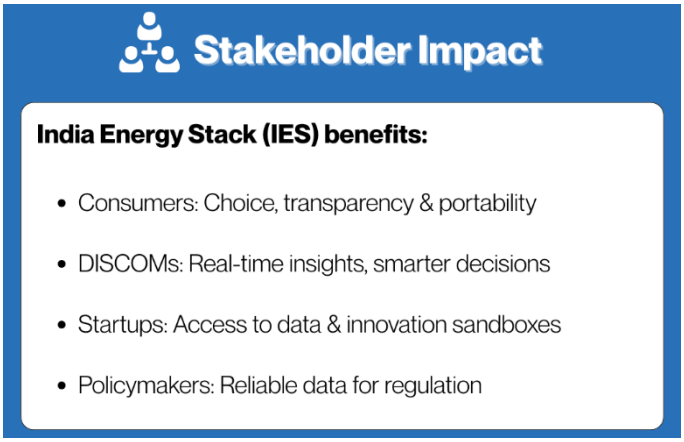
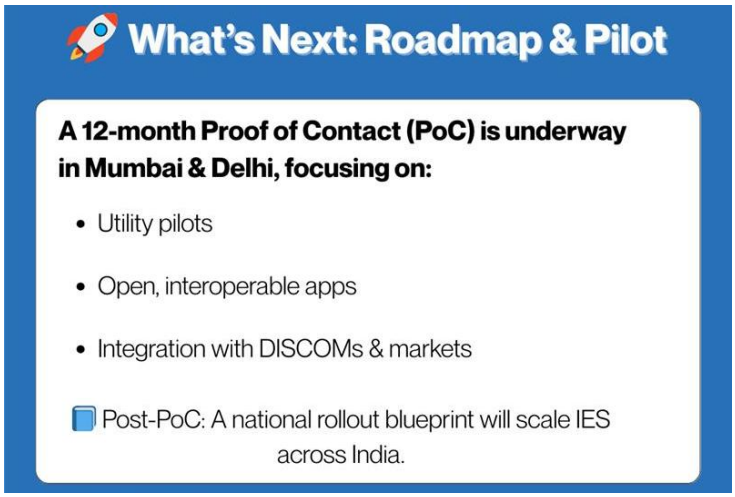


The India Energy Stack is a multi-layered digital architecture enabling efficient energy management through secure infrastructure, interoperable services, and data-driven applications like UIP for analytics and market engagement.

It benefits the entire ecosystem—consumers enjoy choice and transparency, DISCOMs gain real-time insights, startups access innovation tools and data, and policymakers receive reliable, aggregated information for effective regulation.





The Ministry of Power will initiate a 12-month Proof of Concept to showcase IES in action through pilots in Mumbai and Delhi, development of open apps, and integration with DISCOMs and market players. Post-PoC, a national rollout and capacity-building plan will scale the stack across India.

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Summary

Imagine India in 2035- a nation buzzing with electric vehicles, smart cities, and digital industries, all powered by a robust and sustainable energy grid. This transformation is not just a dream, but a strategic blueprint laid out in our report "Capex and Currents: INR 65 Trillion Capex to Electrify India-2035" At the heart of this vision is a staggering investment of INR 65–70 trillion, aimed at tripling the country's electricity generation to over 4,000 TWh. The story begins with a massive expansion in power capacity, where solar and wind emerge as the heroes, likely to contribute together nearly 845 GW- more than 60% of the new grid in 2035. Solar alone is estimated to generate nearly 1,000 billion units, backed by a Rs 23 trillion investment, while wind follows with Rs 11.5 trillion.

But the journey doesn't stop at generation. To carry this power across the nation, India must build a transmission superhighway- 2.3 lakh circuit kilometers of new lines, demanding Rs 13 trillion. Meanwhile, the digital backbone of this energy revolution will be laid through 30 crore smart meters, requiring Rs 1.3 trillion, enabling real-time monitoring and efficient distribution. Even as coal's share declines to 24%, it remains a key player in base-load generation, ensuring energy security. The report paints a picture of a balanced, future-ready energy ecosystem- where renewables dominate, coal stabilizes, and technology enhances efficiency. It's a story of ambition, innovation, and strategic foresight, positioning India as a global leader in sustainable power infrastructure.

Key References:

https://www.iea.org/countries/india/electricity

https://iced.niti.gov.in

https://www.prb.org/international/indicator/population-2035/snapshot

https://www.pib.gov.in/PressReleasePage.aspx?PRID=2089243#:~:text=National%20Electricity%20Plan%3A%20Govt.,is%20Rs%209.15%20lakh%20Cr

https://www.motilaloswal.com/site/rreports/638627647559430011.pdf

https://cea.nic.in/wp-content/uploads/psp___a_i/2024/01/Draft_NEP_Vol_II.pdf

https://www.careratings.com/uploads/newsfiles/1718259786_Smart%20Meter.pdf

https://www.financialexpress.com/business/industry-govt-envisages-rs-9-15-lakh-crore-investments-in-power-transmission-by-2032-3619628/

https://www.pib.gov.in/PressReleasePage.aspx?PRID=2140416

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