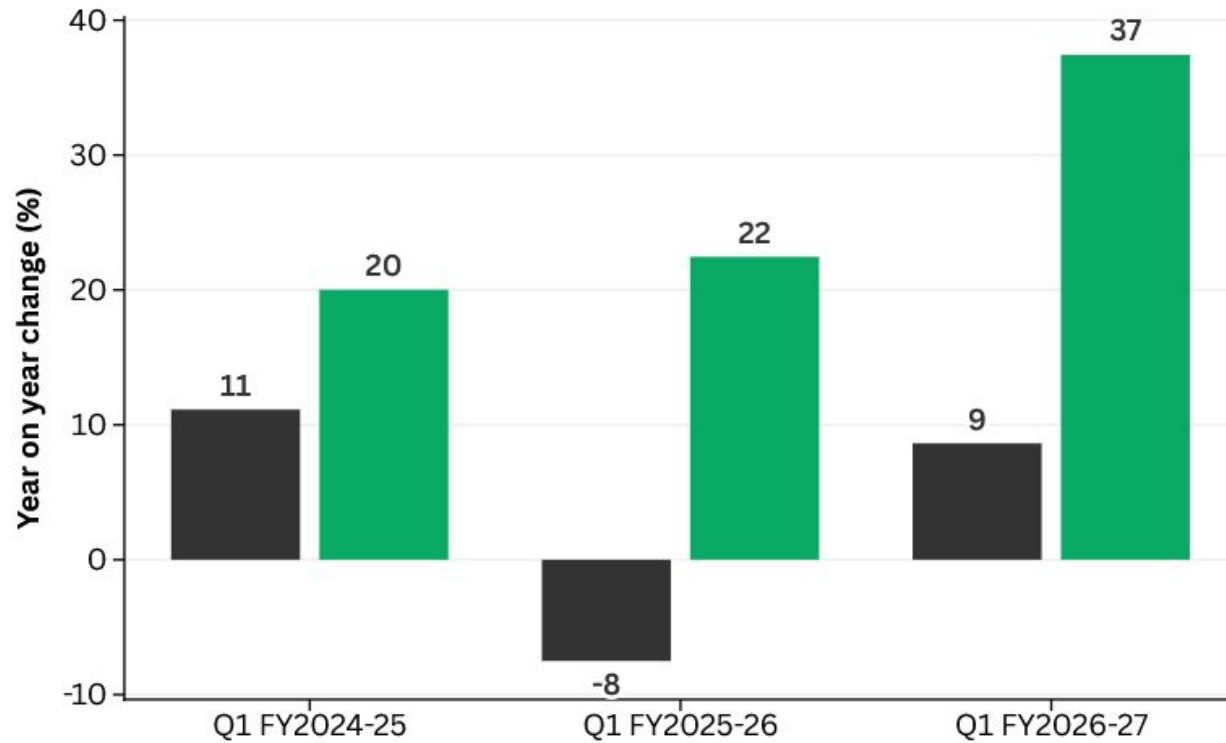


Comparison of year-on-year growth in coal and solar generation

■ Coal + Lignite ■ Solar



Source: GRID-India



CREA

Centre for Research on Energy and Clean Air

Quarterly energy snapshot for India

Q1 2026-27

Key findings

Demand trends

- Peak electricity demand reached a record 271 GW on 21 May 2026, around 12% higher than the peak recorded during Q1 FY2025-26 (243 GW).
- During 61 of the 91 days in Q1 FY2026-27, the daily peak occurred during solar generation hours. Solar's contribution of more than one-fifth of total generation during the system peak demonstrates its growing role in supporting India's daytime electricity demand.
- Maharashtra recorded the highest state-level peak demand at 30 GW, followed by Uttar Pradesh (27 GW) and Gujarat (25 GW).

Generation

- India's electricity generation increased by 9% year-on-year during Q1 FY2026-27, reaching a record 524 BU.
- Solar remained the fastest-growing major source of electricity generation, increasing by 37% year-on-year, compared with 13% for nuclear, 10% for wind, and 9% for coal and lignite. Hydropower generation declined by 9% over the same period.
- Over the past three years, solar generation has more than doubled, increasing from 28 BU in Q1 FY2023-24 to 57 BU in Q1 FY2026-27. Solar output also reached a new daily record, with 696 MU generated on 11 May.
- Solar accounted for 10.9% of India's electricity generation, crossing the 10% share for the first time during the April-June quarter.
- Coal and lignite contributed 369 BU (around 70% of total generation). However, coal generation grew by 9%, substantially slower than solar generation, reflecting the increasing contribution of renewable energy to India's electricity mix.
- Combined non-fossil generation (renewables, hydropower and nuclear) reached a record 149 BU.

Energy storage

- India's energy storage pipeline continues to expand rapidly. As of [May](#) 2026, tenders for approximately 272 GWh of storage capacity have been issued, including 142 GWh of pumped storage projects (PSP) and 133 GWh of battery energy storage systems (BESS).
- About 7.5 GWh of India's BESS is currently operational, around 3 GWh is expected to be commissioned by December 2026.
- Energy storage is now playing an operational role in India's power system. During nighttime peak demand, storage contributed up to 4.1 GW, supplying around 1.1–1.8% of national electricity demand.

Renewable energy curtailment and emergency TRAS

- Despite record renewable generation, significant volumes of renewable electricity continued to be curtailed because of grid and operational constraints.
- During Q1 FY2026-27, approximately 186 GW (473 MU) of solar generation and 50 GW (112 MU) of wind generation were curtailed. In addition, 422 GW (1,286 MU) of solar and 67 GW (211 MU) of wind generation were backed down under the Tertiary Reserve Ancillary Service (TRAS) mechanism.
- The continued increase in renewable generation alongside persistent curtailment and TRAS-backed reductions highlights the growing need for transmission expansion, grid flexibility and battery energy storage systems to maximise renewable utilisation while maintaining reliable system operations.

Plant load factor

- For Q1 2026-27, India's Plant Load Factor (PLF) for coal stands at 73%, lignite at 55%, gas at 15%, nuclear at 85%, large hydro at 33%, solar at 23%, wind at 28%, and small hydro at 20%.
- Compared to Q1 2025-26, India's PLF of coal increased by 3% (70% to 73%), gas decreased by 9% (24% to 15%), nuclear increased by 9% (76% to 85%), and lignite increased 5% (51% to 55%). While the Capacity Utilisation Factor (CUF) of solar increased 1% (22% to 23%), small hydro decreased 8% (28% to 20%), wind decreased 2% (30% to 28%), and large hydro decreased 4% (37% to 33%).

Installed capacity

- As of June 2026, India's total installed capacity stood at 549 GW. Coal remained the largest contributor at 224 GW, followed by solar (162 GW), wind (57.4 GW), and large hydro (52 GW).
- Non-fossil fuel sources (solar, wind, large hydro, other renewable energy, and nuclear) now account for approximately 54% of total installed capacity, compared to 46% from fossil fuel sources.

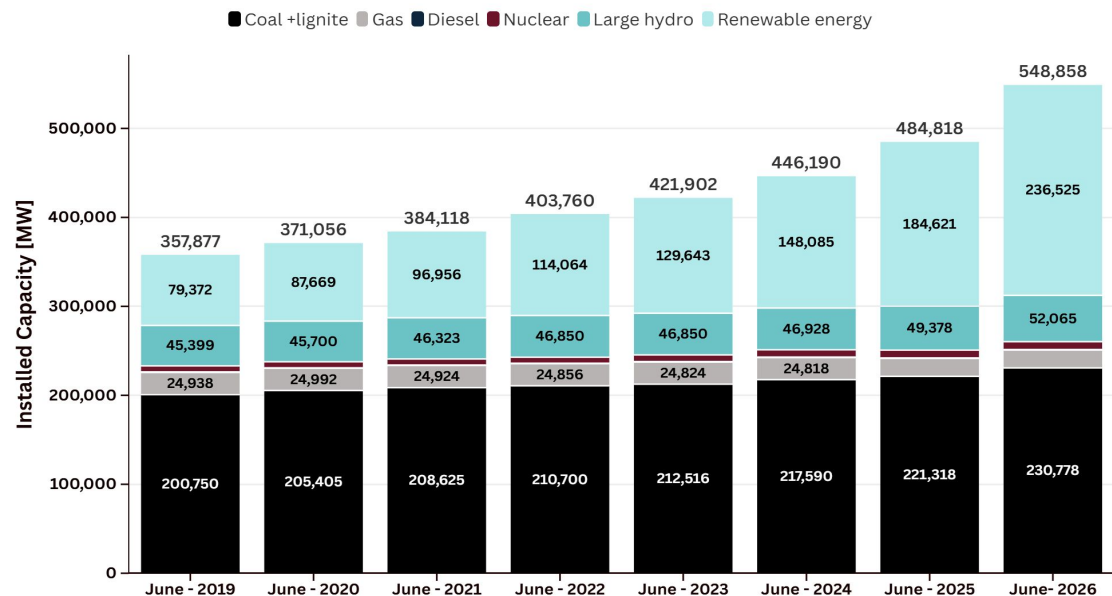
Capacity additions and retirements

- Capacity additions in the Q1 2026-27 period were led by renewables, with 13 GW of renewable energy added, compared to 2.26 GW of thermal, and 0.65 GW of large hydro.
- About 237.5 MW thermal power capacity (62.5 MW coal based and 175 MW gas based) retired in Q1 2026-27.

Source-wise installed electricity generation capacity in India

- India's installed power capacity reached 549 GW at the end of [June](#) 2026, up 13% from June 2025, 23% from June 2024, and 30% from June 2023.
- Coal and lignite remained the largest installed sources at 231 GW (42%), though their share has steadily declined from 56% in 2019 and 46% in 2025.
- Renewable energy (excluding large hydro) saw the fastest growth, rising to 237 GW (43%) in June 2026 from 185 GW (38%) in June 2025, 148 GW (33%) in June 2024, and just 79 GW (22%) in June 2019. Solar drove much of this expansion, reaching 162 GW (30%) of total installed capacity.
- Large hydro capacity stood at 52 GW (9%), while gas declined to 20.1 GW (4%). Nuclear remained relatively stable at 8.8 GW (2%).

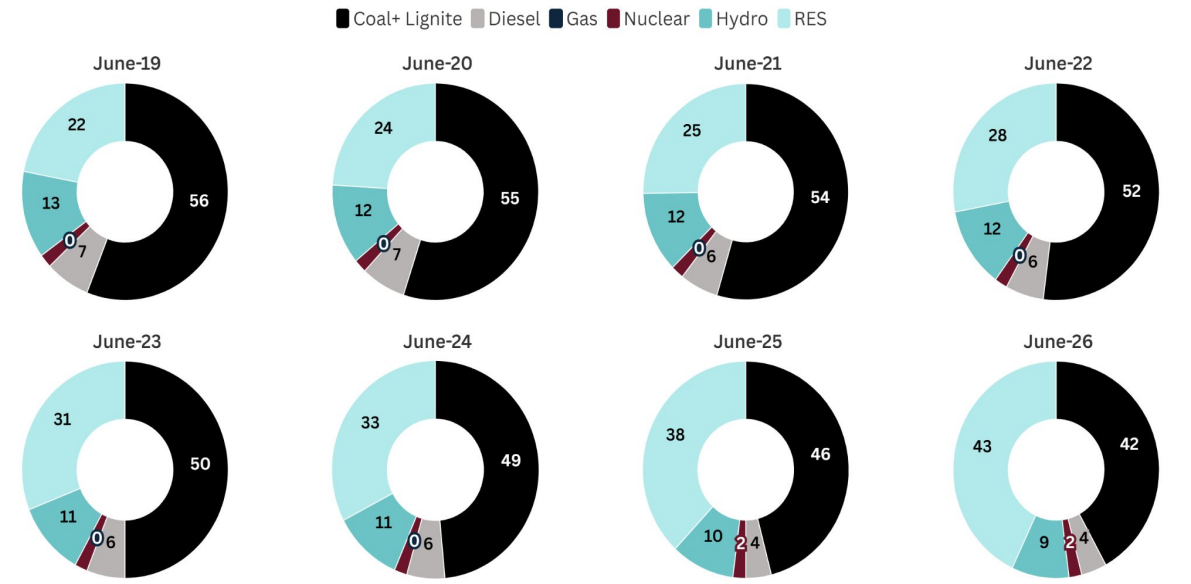
Source-wise installed electricity generation capacity in India (MW)- End of 2 nd Quarter every year since 2019



Source: Central Electricity Authority (CEA)
June 2026



Contribution of each source in percentage to total Installed capacity



Source: Central Electricity Authority (CEA)
June 2026



Figure 1 — Source wise installed capacity in India

Figure 2 — Contribution of each source to total installed capacity

Commissioned, retired, and under construction thermal electricity generation capacity in India

- India commissioned 2.26 GW of new thermal power capacity in Q1 2026-27, entirely coal-based.
- About 238 MW thermal capacity (62.5 MW coal based TPP and 175 MW gas based TPP) was retired in Q1 2026-27.
- As of June 2026, 42.7 GW of coal-based capacity is under construction. The central sector accounts for the largest share at 19.3 GW (45%), followed by the state sector at 9.8 GW (23%), and the private sector at 13.6 GW (32%).
- Much of the pipeline remains at an early stage of development, with nearly 37.8 GW (89%) of under-construction coal capacity below 50% completion.

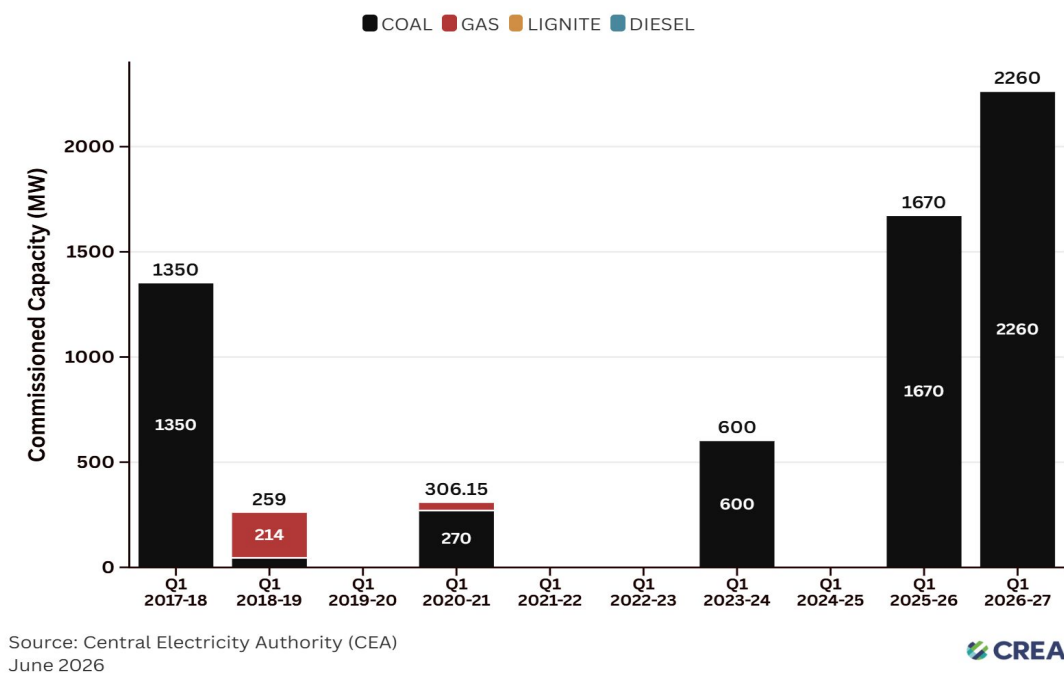


Figure 3 — Thermal capacity commissioned in Q1

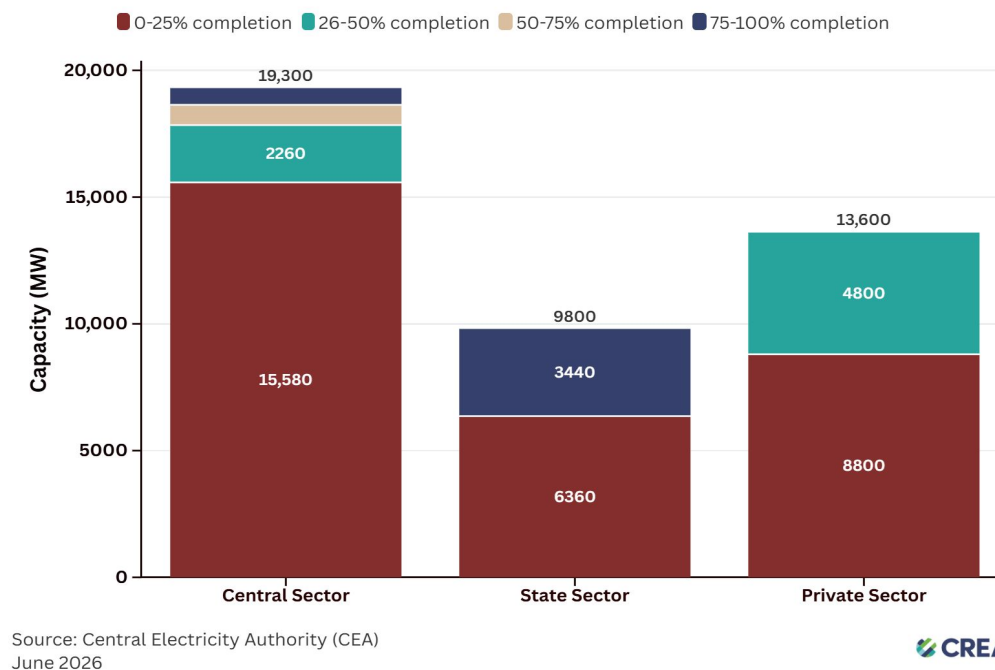
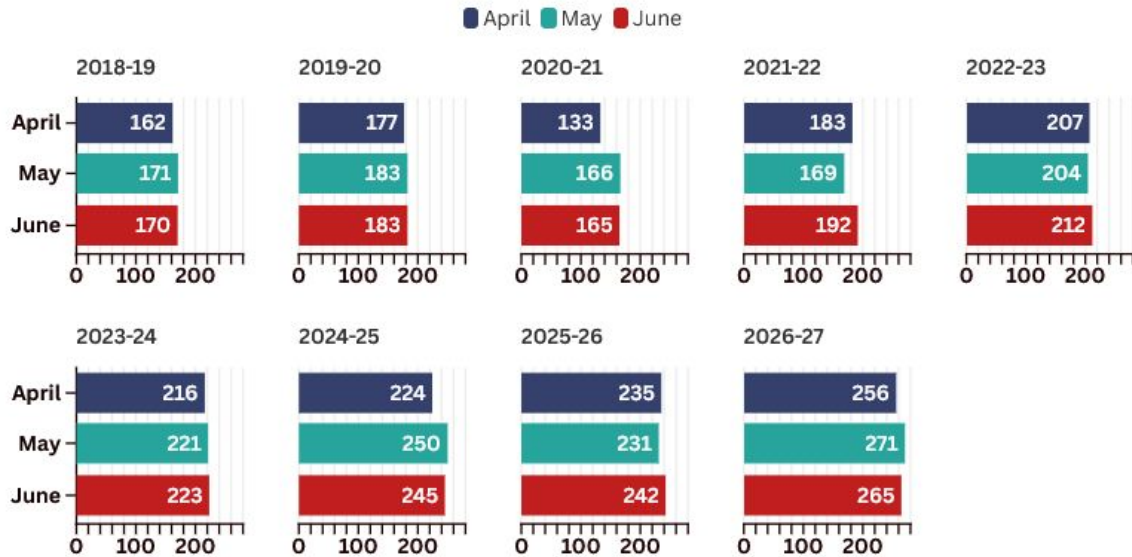


Figure 4 — Sector-wise coal based electricity generation capacity under construction in India as of May 2026

Monthly maximum peak demand

- Year-on-year growth in national peak power demand has moderated, declining from 15% in Q1 2021–22 to 11% in Q1 2022–23, decreasing again to 5% in Q1 2023–24, rising to 12% in Q1 2024–25, and decreasing again to -3% in Q1 2025–26, before rising back to 12% in Q1 2026–27.
- At the state level, Maharashtra recorded the highest peak demand in Q1 2026–27 at 30 GW, followed by Uttar Pradesh (27 GW), Gujarat (25 GW), Tamil Nadu (20 GW), and Karnataka (16 GW).

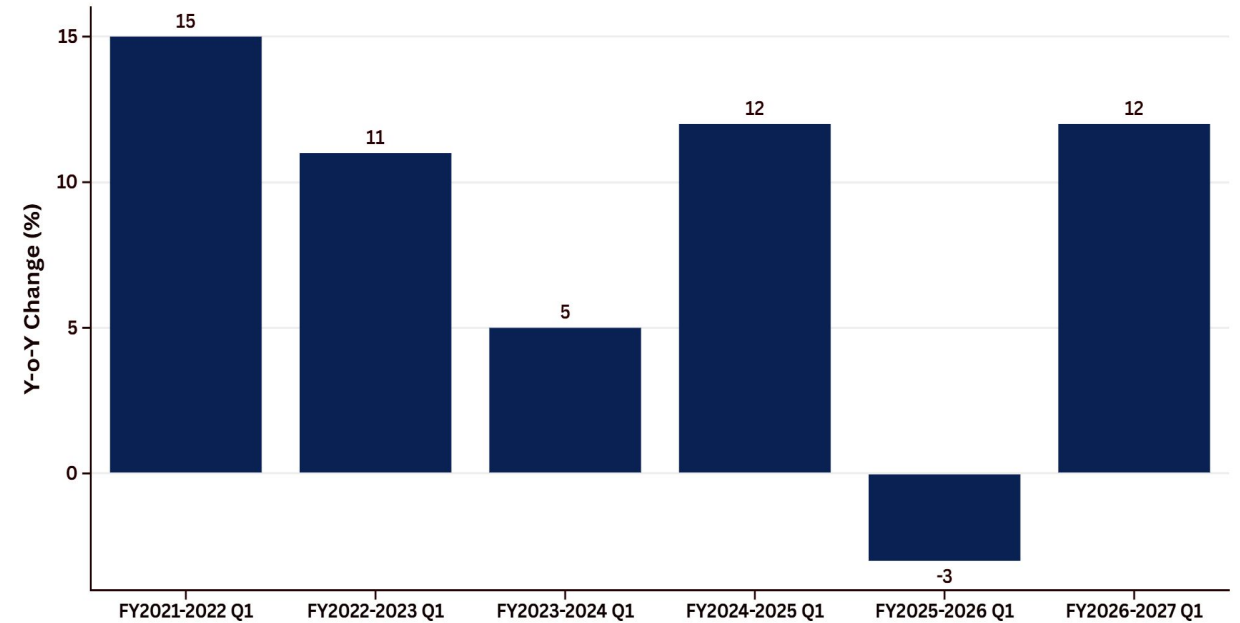
Monthly peak demand (GW) in Q1



Source: GRID-INDIA
June 2026



Figure 5 – Monthly maximum peak demand at national level



Source: GRID-INDIA
June 2026



Figure 6 – Peak demand year-on-year change

Electricity generation

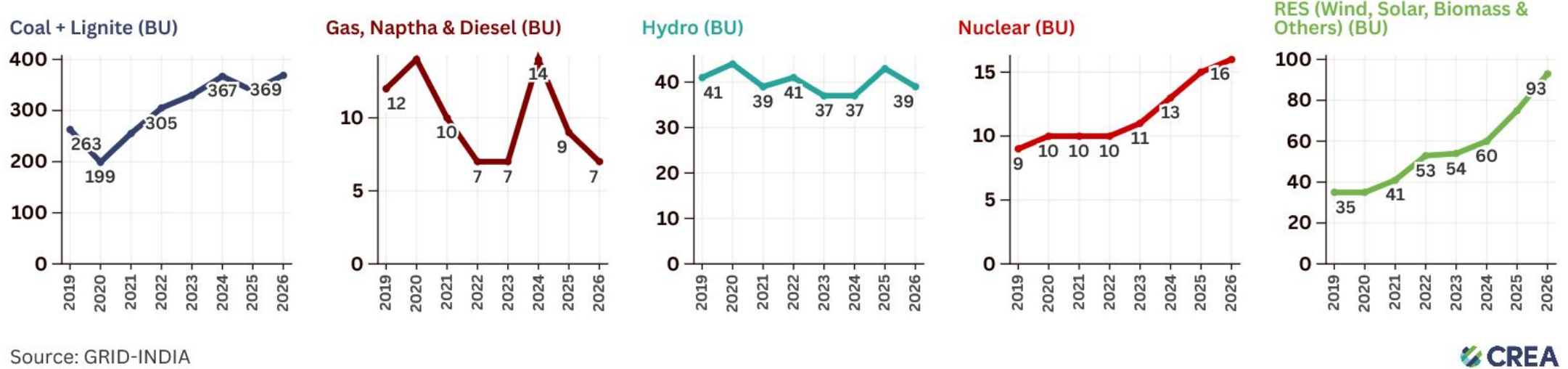


Figure 7 – Source wise electricity generated in Q1

- Year-on-year growth in Q1 electricity generation decreased from 17% in Q1 2021–22 and Q1 2022–23 to 6% in Q1 2023–24, followed by an increase to 12% in Q1 2024–25, then a decrease to -2% in Q1 2025–26 and again an increase to 9% in Q1 2026–27.
- Coal continued to dominate the generation mix in Q1 2026–27, contributing 360 BU (69%).
- Renewable energy sources accounted for a growing share in Q1 2026–27, led by solar at 57 BU (11%), followed by large hydro (39 BU, 7%), and wind (31 BU, 6%).
- Nuclear contributed 16 BU (3%), while lignite (8 BU, 2%), and gas, naphtha and diesel (7 BU, 1%) made up smaller shares. Other renewables contributed 5 BU (1%).

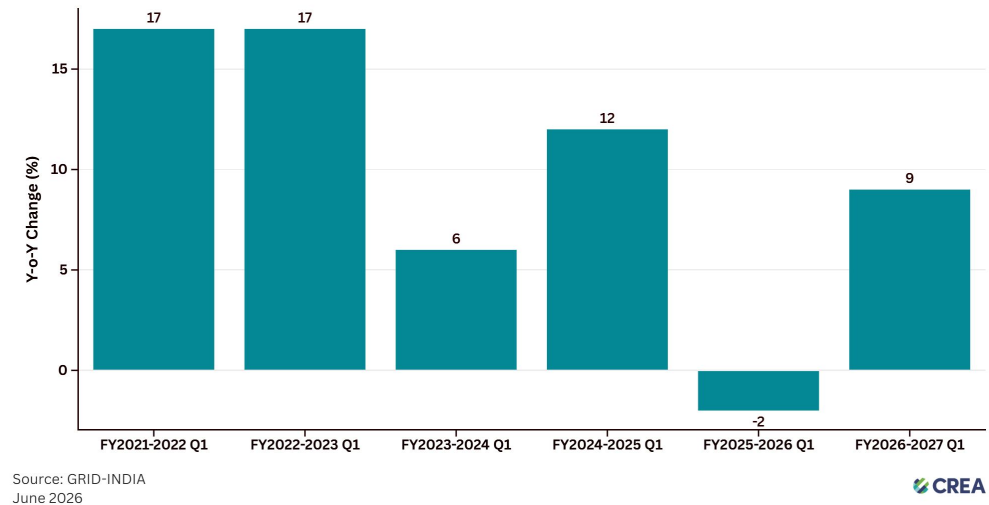
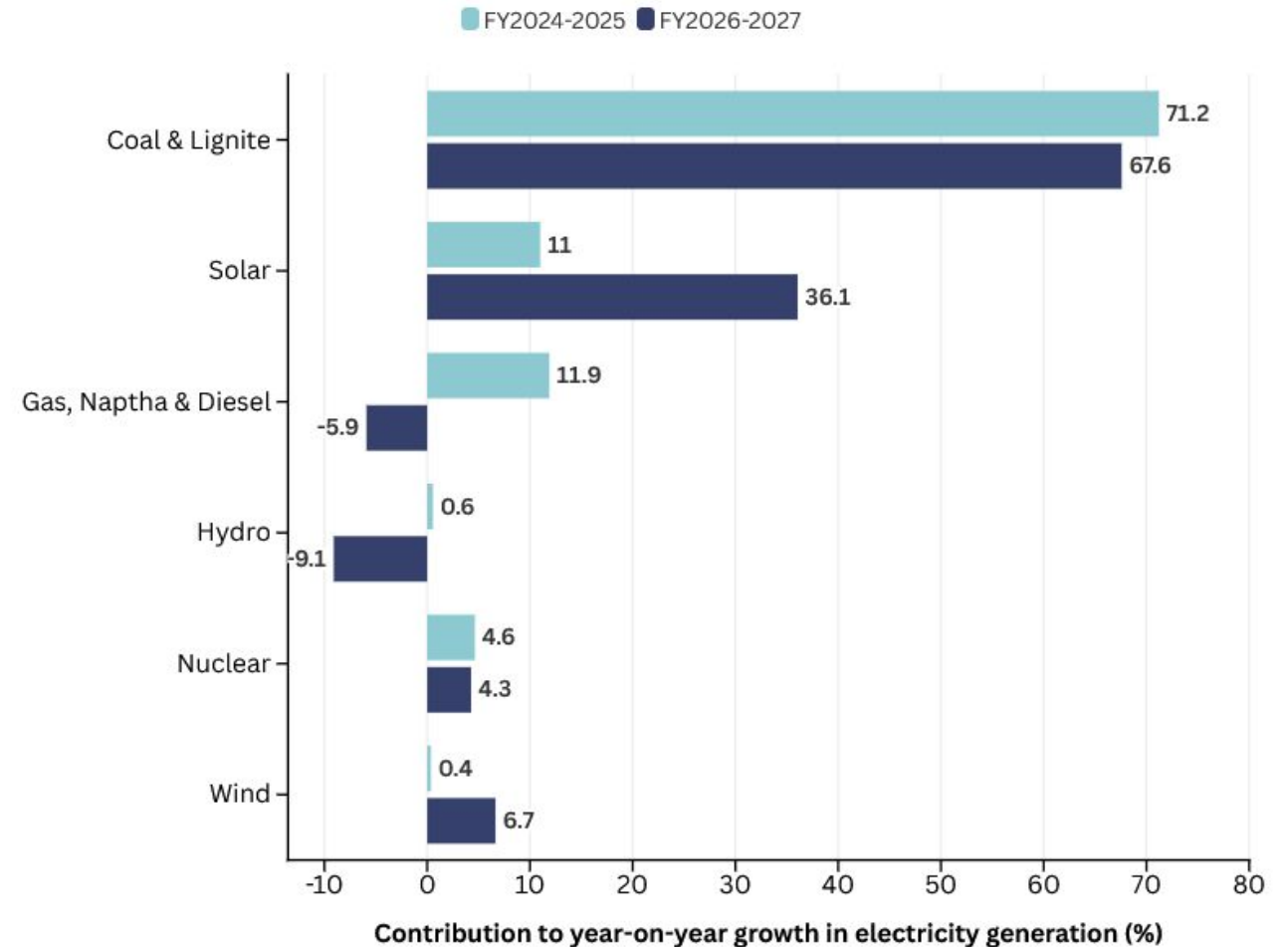


Figure 8 – Electricity generation year-on-year change

Electricity generation

- Solar's contribution to the increase in electricity generation more than tripled, rising from 11% in Q1 FY2024–25 to 36% in Q1 FY2026–27, reflecting its growing role in meeting rising electricity demand.
- Solar accounted for 84% of the increase in renewable electricity generation during the quarter, making it the primary driver of renewable generation growth.
- Coal and lignite remained the largest contributors to generation growth, but their share declined from 71% to 68% as solar met a larger share of incremental electricity demand.
- On 61 of the 91 days in Q1 FY2026–27, national peak demand occurred during solar generation hours, indicating the increasing role of solar in meeting daytime electricity demand.
- Renewable energy sources contributed 43% of the increase in electricity generation. Lower hydropower generation reduced the overall contribution of non-fossil sources, including hydropower and nuclear, to 38%.
- Declines in hydropower and gas generation increased the relative contribution of coal and solar to meeting additional electricity demand during the quarter.



Source: GRID-India



Figure 9 – Contribution of different sources to the year-on-year increase in electricity generation (%)

Renewable energy curtailment

- Renewable energy losses were substantial in Q1 2026-27. Around 185.5 GW of solar and 50 GW of wind generation were directly curtailed during the quarter, indicating that available renewable generation could not be fully absorbed by the grid. Curtailment and TRAS data were unavailable for 5–9 June 2026.
- Emergency curtailment under TRAS was significantly higher than direct curtailment. Solar recorded 421.7 GW of TRAS-related curtailment, more than two times higher than direct solar curtailment, while wind saw 67.4 GW curtailed under TRAS, compared to 50 GW of direct curtailment.
- Solar curtailment was the highest in April. Solar curtailment dropped to 36.9 GW in June, up from 68.4 GW in May and 80 GW in April, while solar TRAS curtailment surged to nearly 186 GW, the highest monthly level in the quarter.
- Solar accounted for nearly 79% of total direct curtailment and over 86% of TRAS curtailment.
- Curtailment remained concentrated in high-renewable states. Gujarat recorded the highest solar curtailment (122 GW; 276 MU) and wind curtailment (39 GW; 81 MU) during the quarter.
- The highest TRAS-down events were also observed in Gujarat, particularly at the Khavda and Bhuj pooling stations, where approximately 79 GW (234 MU) of solar generation and 19 GW (62 MU) of wind generation were backed down.

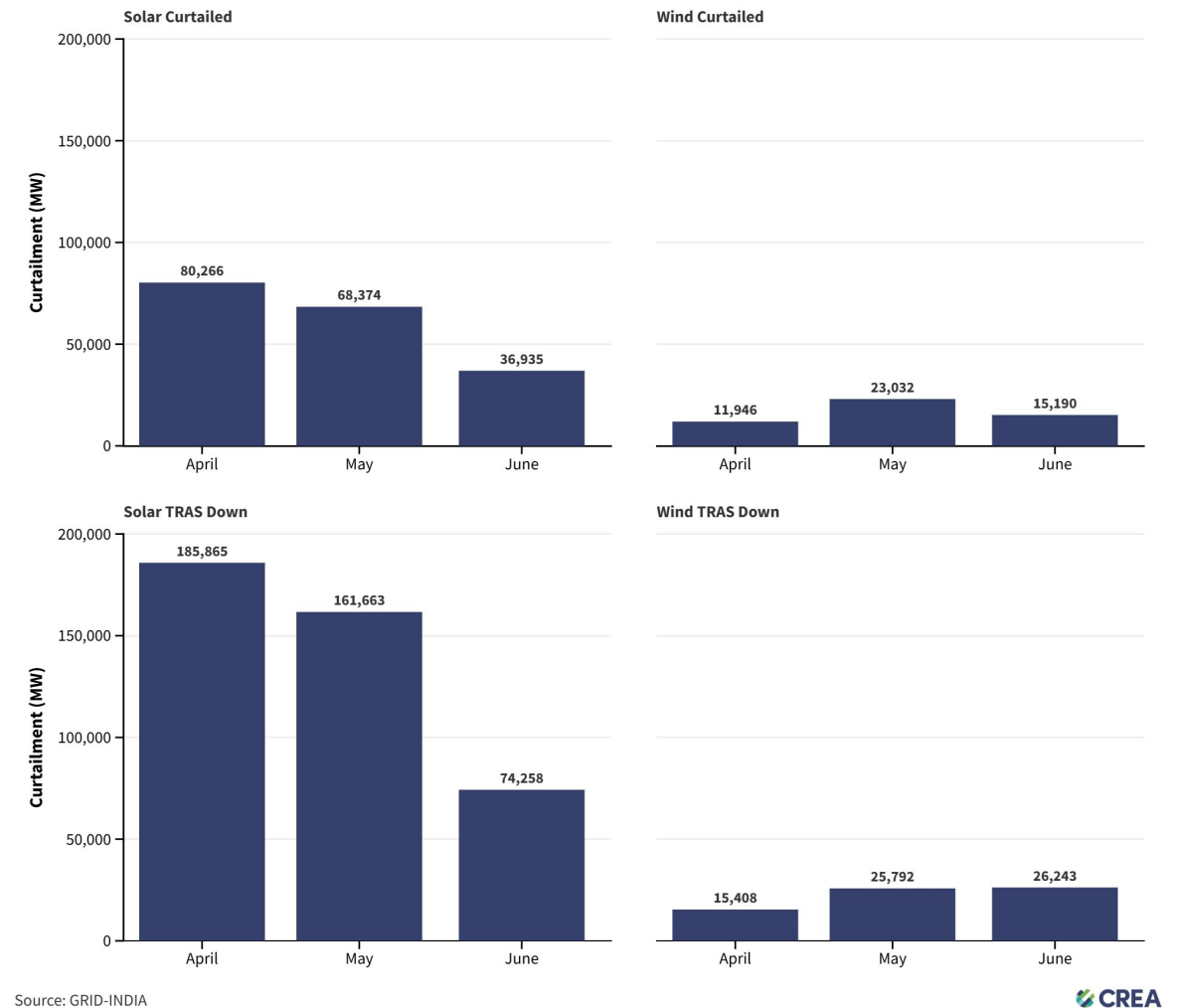
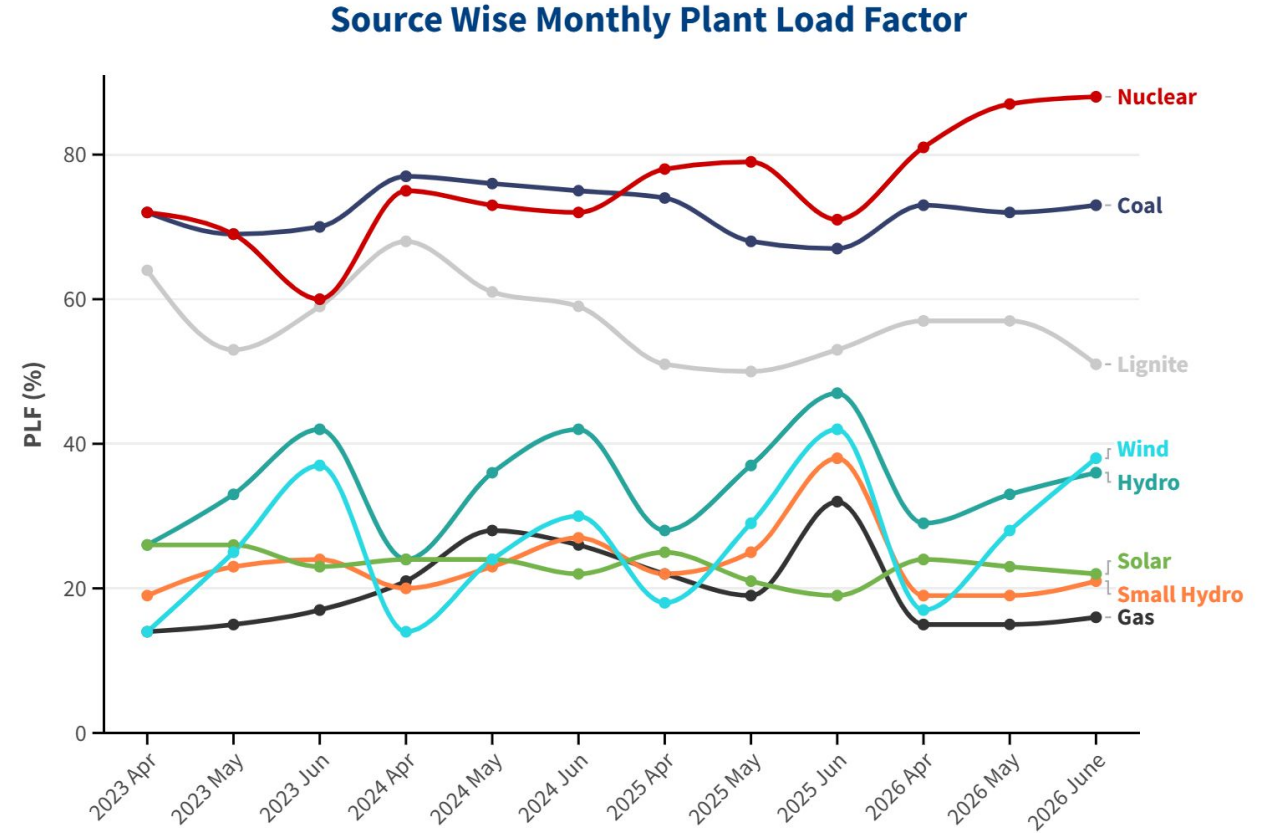


Figure 10 – Renewable energy curtailment in Q1 2026-27

Plant load factor

- Solar CUF averaged 23%, higher than 22% in Q1 2025-26
- Wind CUF decreased to 28% from 30% in Q1 2025-26, while small hydro CUF declined to 20% from 28% last year.
- Hydro PLF decreased to 33% in Q1 2026-27 from 37% in Q1 2025-26.
- Gas PLF reduced to 15%, up from 24% in Q1 2025-26.
- Nuclear PLF increased to 85% in Q1 2026-27 from 76% in Q1 2025-26, while lignite PLF increased to 55%, from 51% last year.
- Coal PLF rose to 73% in Q1 2026-27, after a dip to 70% in Q1 2025-26, before that in Q1 2024-25 it was 76% and in Q1 2023-24 it was 70%.



Source: National Power Portal
June 2026



Figure 11 – Source wise plant load factor in Q1