

India's Energy Overview

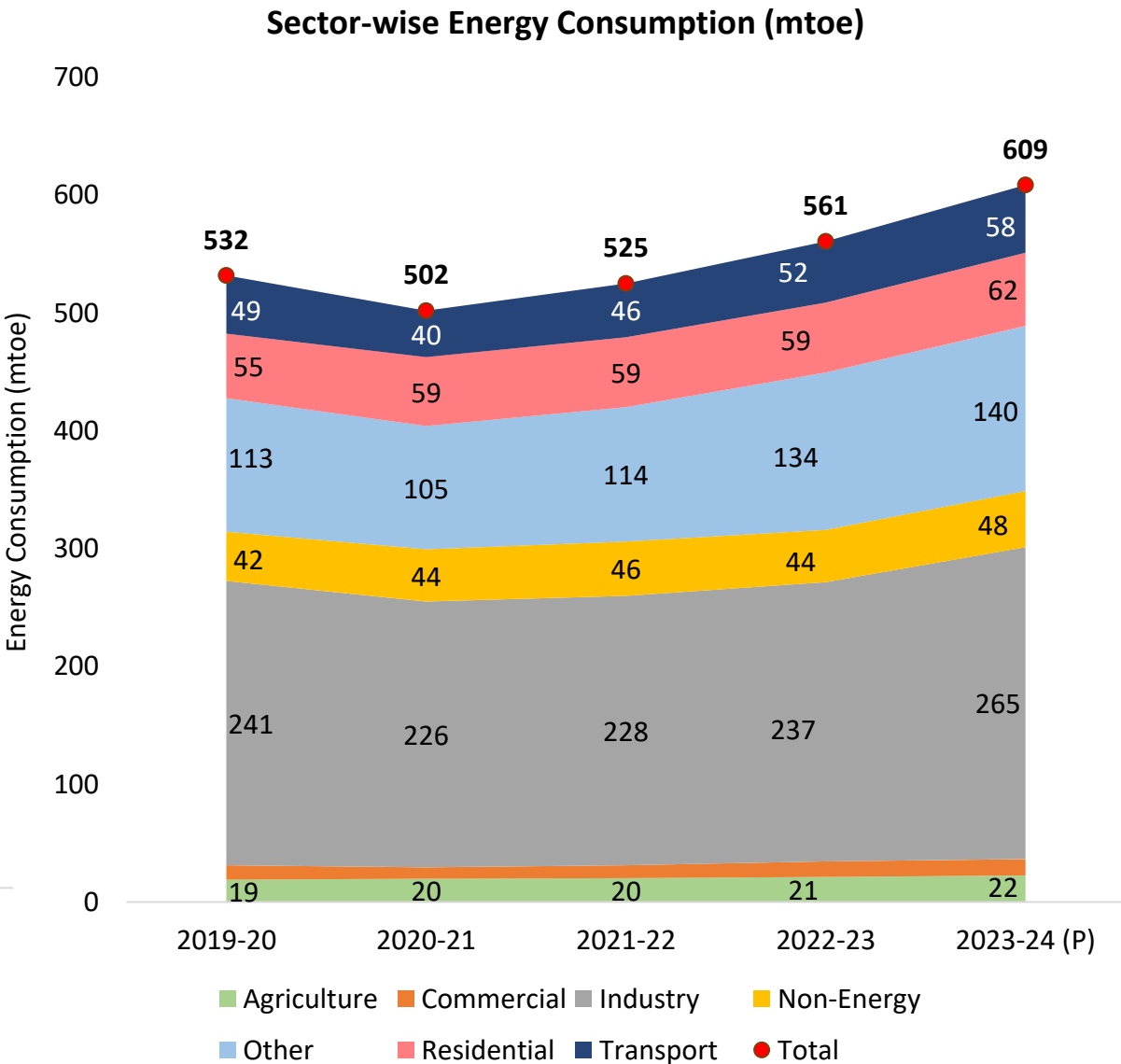
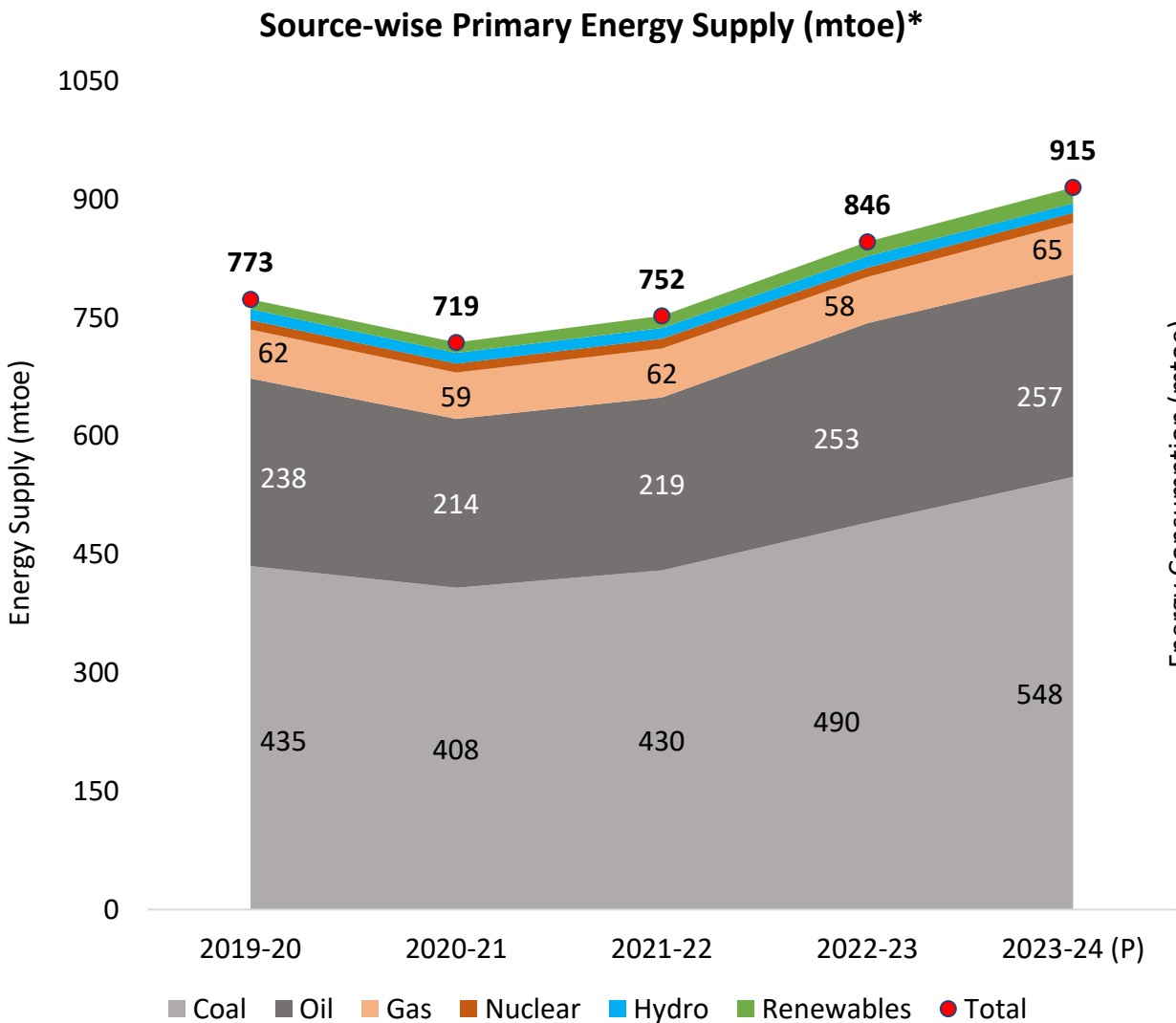
March 2025



Contents

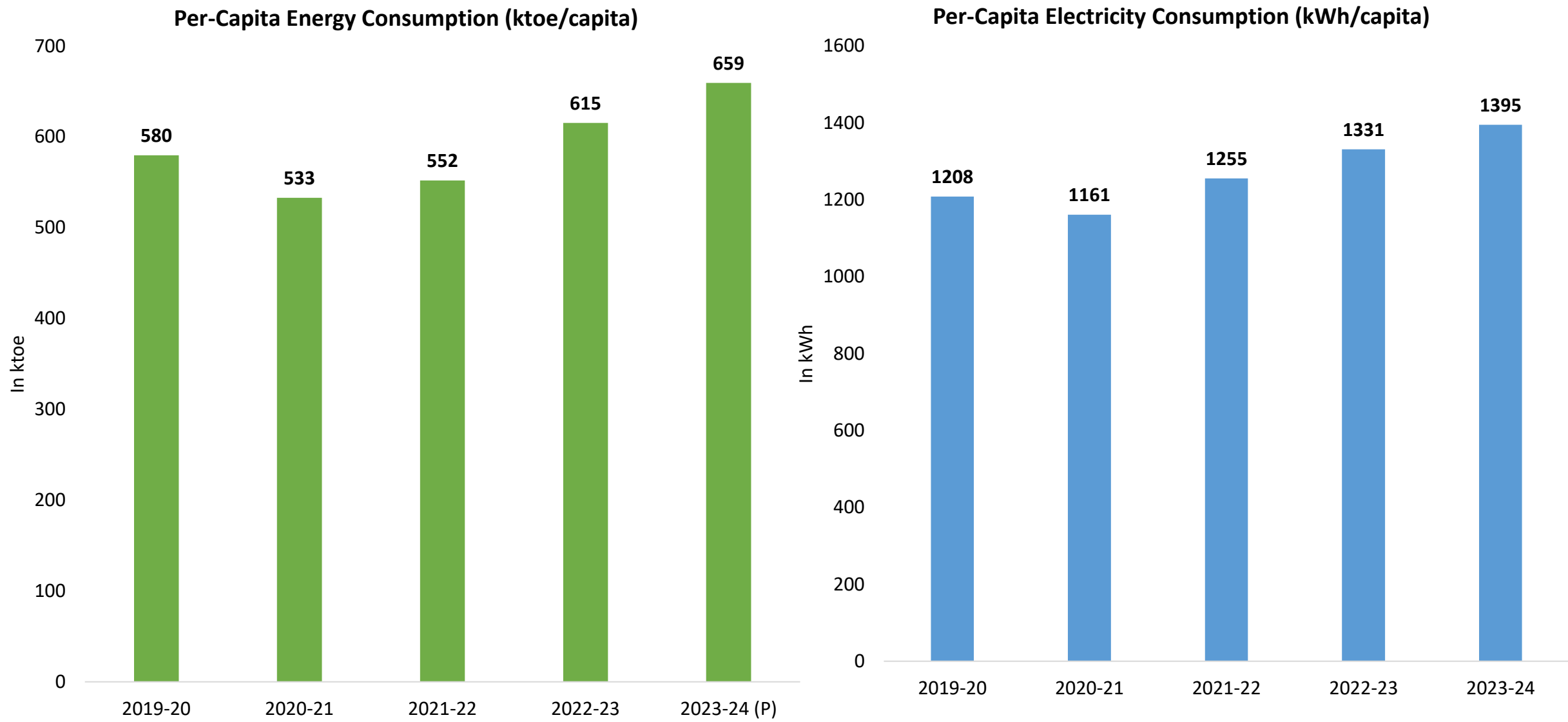
1. Primary and Final Energy Mix in India
2. Per-Capita Energy and Electricity Consumption
3. India's Electricity Capacity Mix (Utility-scale)
4. India's Electricity Addition in last 5 years
5. State-wise Solar Installed Capacity
6. State-wise Wind Installed Capacity
7. Top 10 High RE States and Their Capacity Mix
8. Renewable Energy Potential and Installed Capacity
9. India's Electricity Generation Mix
10. Source-wise PLF/ CUF
11. Thermal Generation Loss and Reasons for Forced Outages
12. Indian Electricity Exchange (IEX) Market Snapshot
13. National and State-level Electricity Demand
14. India's Monthly Electricity Requirement and Supply
15. Monthly Electricity Demand for the top 5 states
16. Electricity Consumer-category wise top 5 States
17. National and State-level Peak Electricity Demand
18. India's Monthly Peak Electricity Demand and Supply
19. All India, Regional, and Seasonal Electricity Demand Curve of Peak Demand Day
20. Monthly Peak Electricity Demand for the top 5 states
21. Monthly Coal Statistics
22. Petroleum Products Market Scenario
23. Daily Prices of Crude Oil
24. Gas Market Scenario
25. Daily Prices of Gas
26. Status of Electric Mobility in India
27. Recent Interventions to Promote Renewable Energy
28. Key Highlights or Announcements of March 2025

Primary* and Final Energy Mix in India



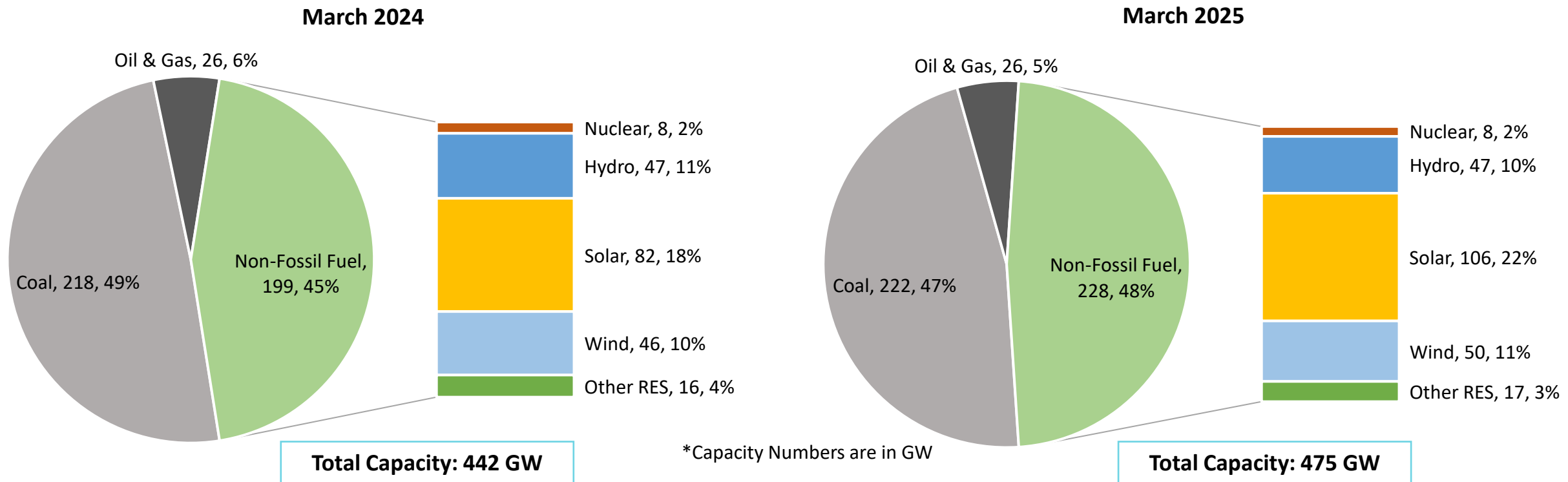
*Excluding biofuels, waste, and other non-commercial source of energy

Per-Capita Energy and Electricity Consumption



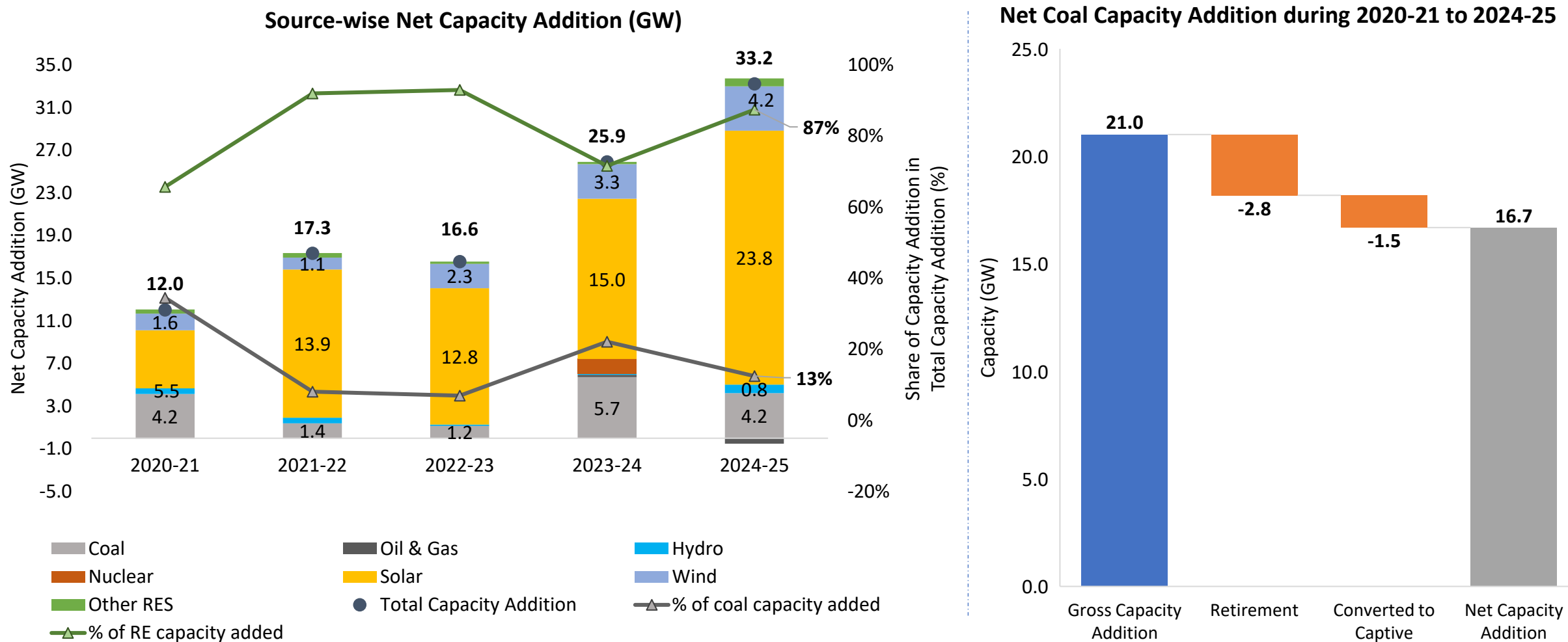
Note: Per Capita energy consumption is calculated on energy supply basis.

India's Electricity Capacity Mix (Utility-scale)



- India's electricity generating capacity is 475 GW as on Mar'2025 [coal 222 GW (47%), solar 106 GW (22%), wind 50 GW (11%), and hydro 47 (10%)].
- As on Mar'2025, the share of non-fossil-based electricity capacity is 48% against the set target of 50% non-fossil capacity by 2030.
- As on Mar'2025, India's renewable energy capacity (including large hydro) stood at 220 GW out of 475 GW.

India's Electricity Capacity Addition in last 5 years



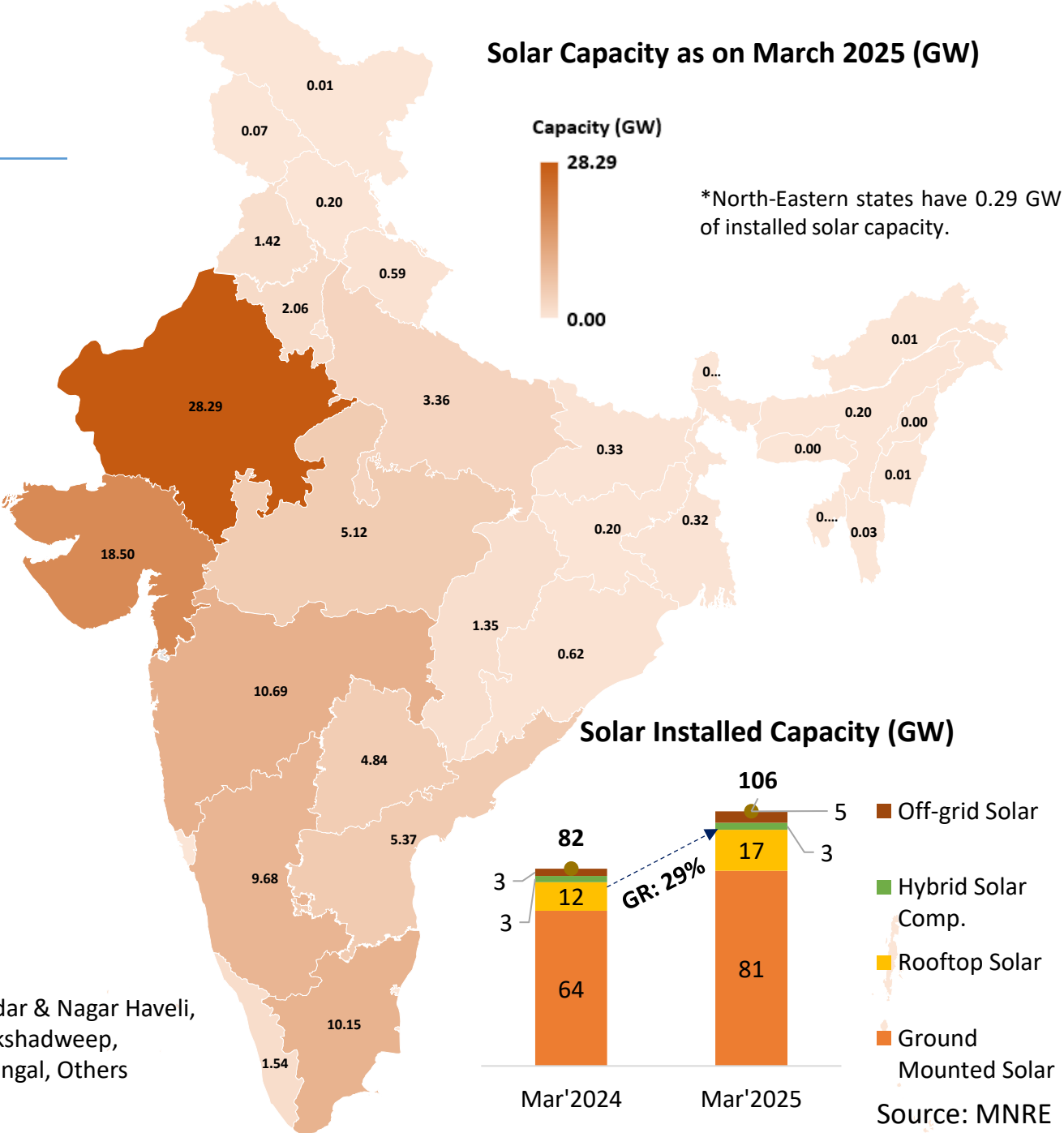
- A total of 87.4 GW of generation capacity has been added in RE (Hydro, solar, wind, and other RES) over the past 5 years (2020-21 to 2024-25), whereas the net coal capacity addition during the same period was 16.7 GW, mostly in the central sector.

State-wise Solar Capacity

as on March 2025

| State-wise installed capacity of Solar Power (GW) | | | | | |
|---|----------------|---------|---------------------------|----------|-------------------|
| States | Ground Mounted | Rooftop | Solar Component in Hybrid | Off Grid | Total Solar Power |
| Rajasthan | 23.99 | 1.52 | 1.98 | 0.81 | 28.29 |
| Gujarat | 12.48 | 5.11 | 0.81 | 0.10 | 18.50 |
| Maharashtra | 5.99 | 3.30 | 0.00 | 1.39 | 10.69 |
| Tamil Nadu | 9.15 | 0.93 | 0.00 | 0.07 | 10.15 |
| Karnataka | 8.86 | 0.70 | 0.08 | 0.04 | 9.68 |
| Andhra Pradesh | 4.99 | 0.29 | 0.00 | 0.09 | 5.37 |
| Madhya Pradesh | 4.50 | 0.51 | 0.00 | 0.10 | 5.12 |
| Telangana | 4.36 | 0.47 | 0.00 | 0.01 | 4.84 |
| Uttar Pradesh | 2.72 | 0.32 | 0.00 | 0.32 | 3.36 |
| Haryana | 0.27 | 0.83 | 0.00 | 0.97 | 2.06 |
| Kerala | 0.32 | 1.19 | 0.00 | 0.02 | 1.54 |
| Punjab | 0.89 | 0.45 | 0.00 | 0.08 | 1.42 |
| Chhattisgarh | 0.85 | 0.11 | 0.00 | 0.39 | 1.35 |
| Odisha | 0.51 | 0.07 | 0.00 | 0.04 | 0.62 |
| Others | 1.13 | 1.22 | 0.00 | 0.31 | 2.65 |
| All India | 81.01 | 17.02 | 2.87 | 4.74 | 105.65 |

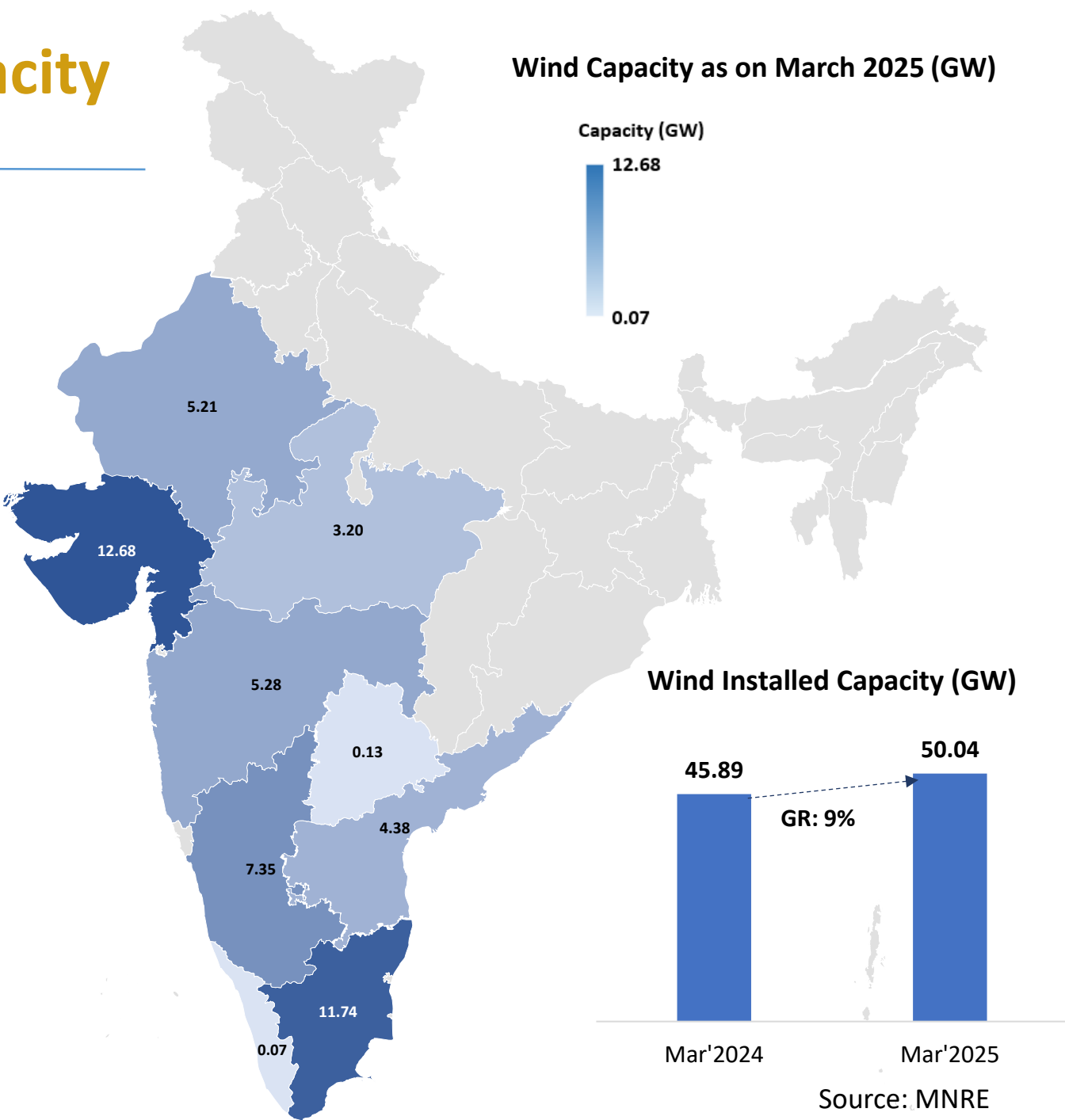
Others include- Andaman & Nicobar, Arunachal Pradesh, Assam, Bihar, Chandigarh, Dadar & Nagar Haveli, Daman & Diu, Delhi, Goa, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Ladakh, Lakshadweep, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Puducherry, Sikkim, Tripura, West Bengal, Others



State-wise Wind Onshore Capacity

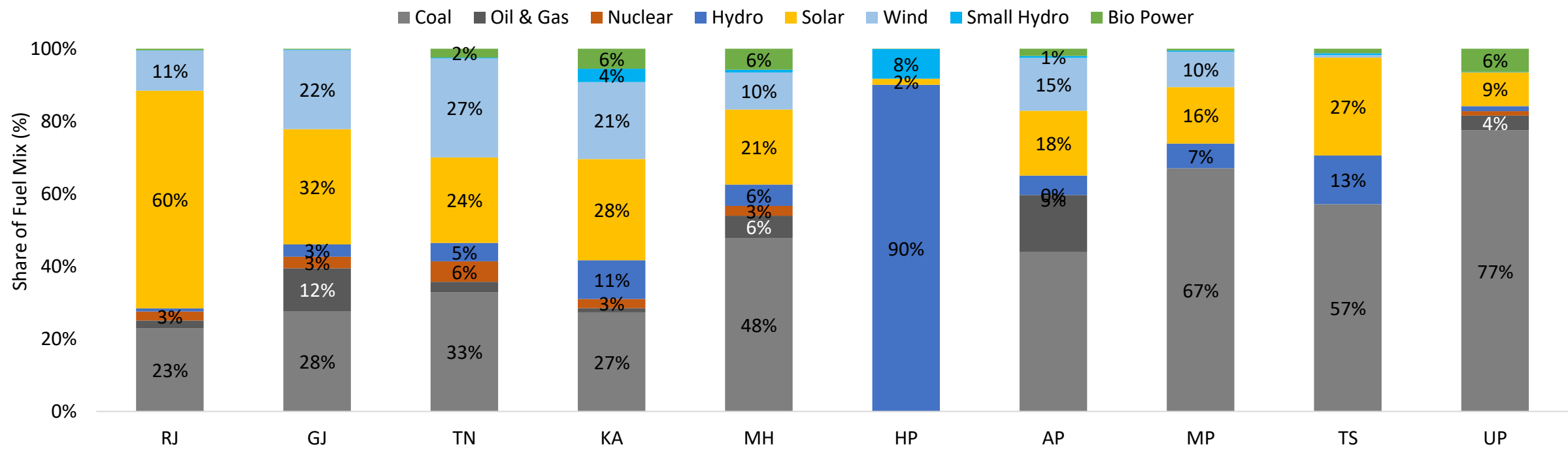
as on March 2025

| State-wise installed capacity of Wind (Onshore) Power | |
|---|-------------------------|
| States | Installed Capacity (GW) |
| Gujarat | 12.68 |
| Tamil Nadu | 11.74 |
| Karnataka | 7.35 |
| Maharashtra | 5.28 |
| Rajasthan | 5.21 |
| Andhra Pradesh | 4.38 |
| Madhya Pradesh | 3.20 |
| Telangana | 0.13 |
| Kerala | 0.07 |
| India Total | 50.04 |



Top 10 High RE States and Their Capacity Mix

as on March 2025



Numbers are in GW

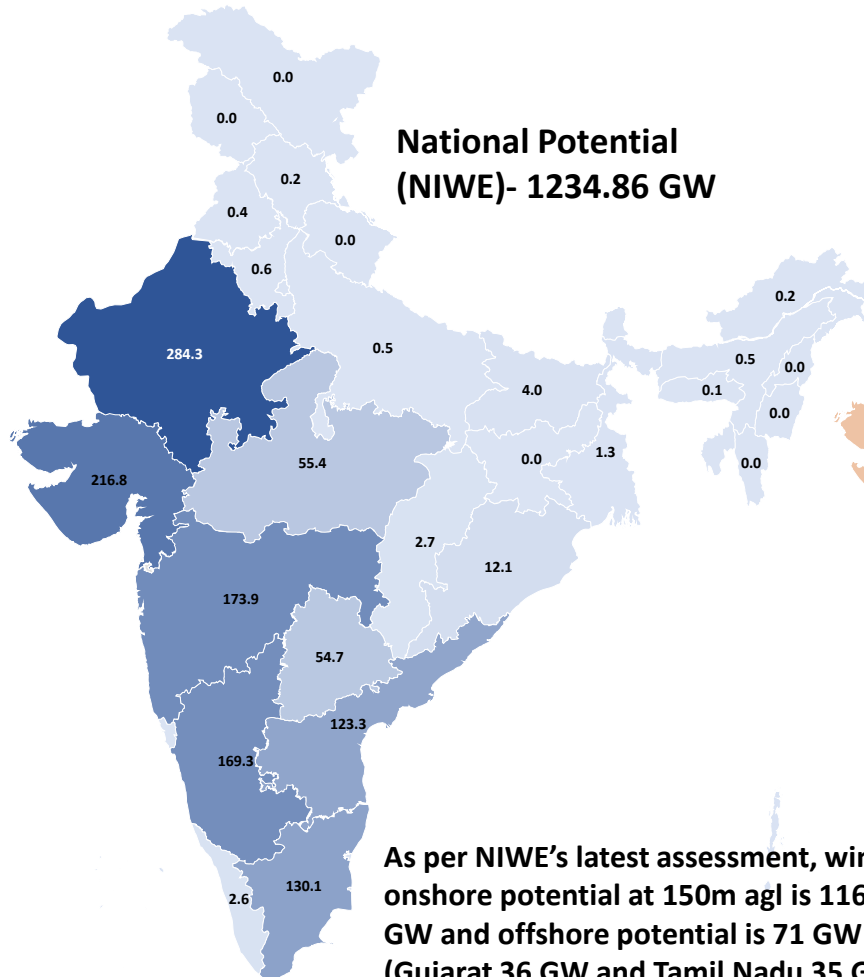
| Parameters | RJ | GJ | TN | KA | MH | HP | AP | MP | TA | UP |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Total Installed Capacity | 47.12 | 58.22 | 43.07 | 34.67 | 51.67 | 12.20 | 30.02 | 32.83 | 17.93 | 36.19 |
| Total RE Capacity | 34.14 | 33.39 | 25.24 | 23.92 | 22.40 | 12.20 | 12.11 | 10.83 | 7.69 | 6.22 |
| RE Share | 72% | 57% | 59% | 69% | 43% | 100% | 40% | 33% | 43% | 17% |

RE Potential and Installed Capacity (1/2)

RE potential in the state

Wind Onshore (at 150m agl) and Offshore Potential

State Potential (GW) 0.0 284.3

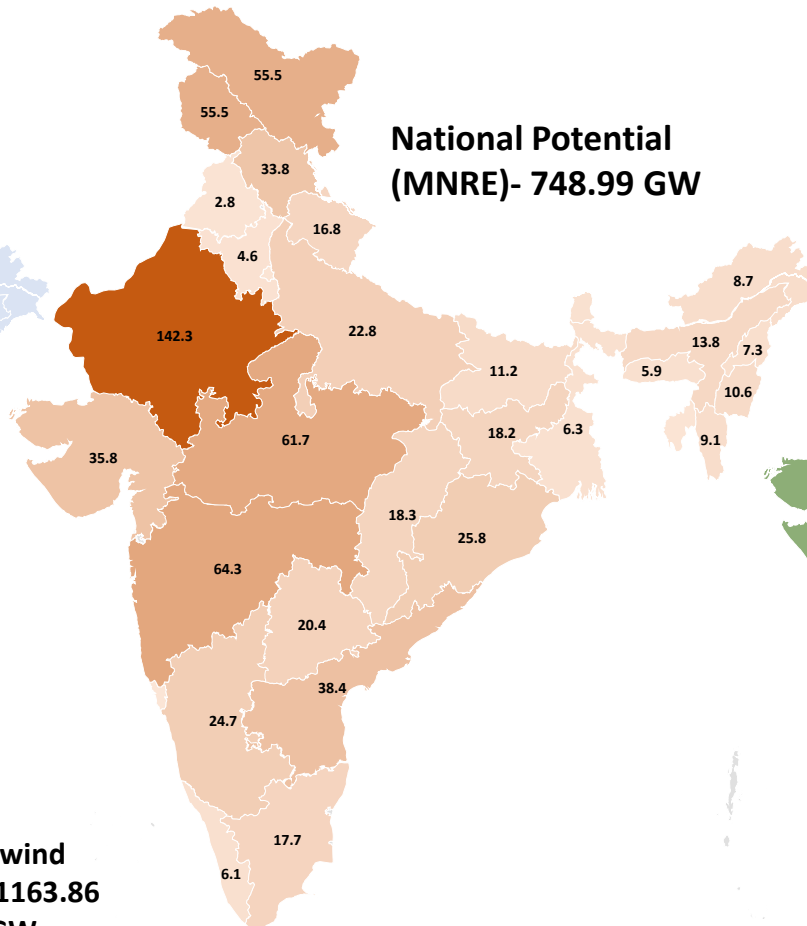


National Potential (NIWE)- 1234.86 GW

As per NIWE's latest assessment, wind onshore potential at 150m agl is 1163.86 GW and offshore potential is 71 GW (Gujarat 36 GW and Tamil Nadu 35 GW).

Solar Potential

State Potential (GW) 0.9 142.3

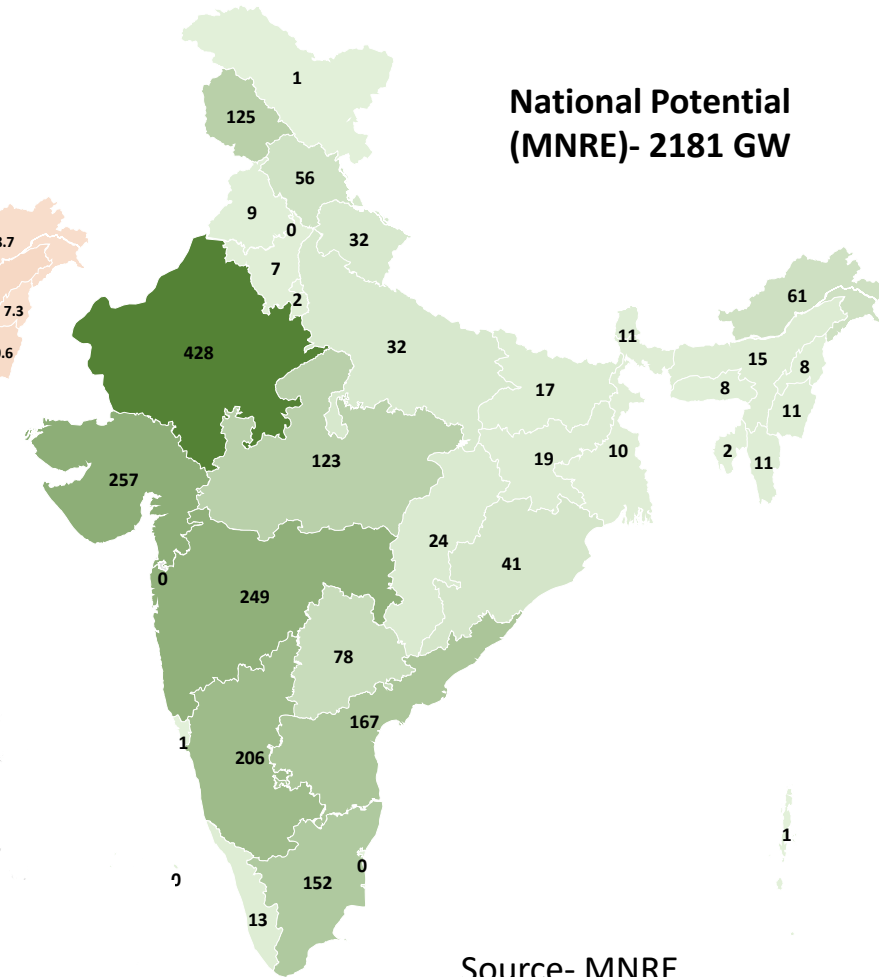


National Potential (MNRE)- 748.99 GW

Market potential for SPV rooftop is 124 GW.

Renewable Energy Potential (all sources incl. large Hydro)

Potential (GW) 0 428

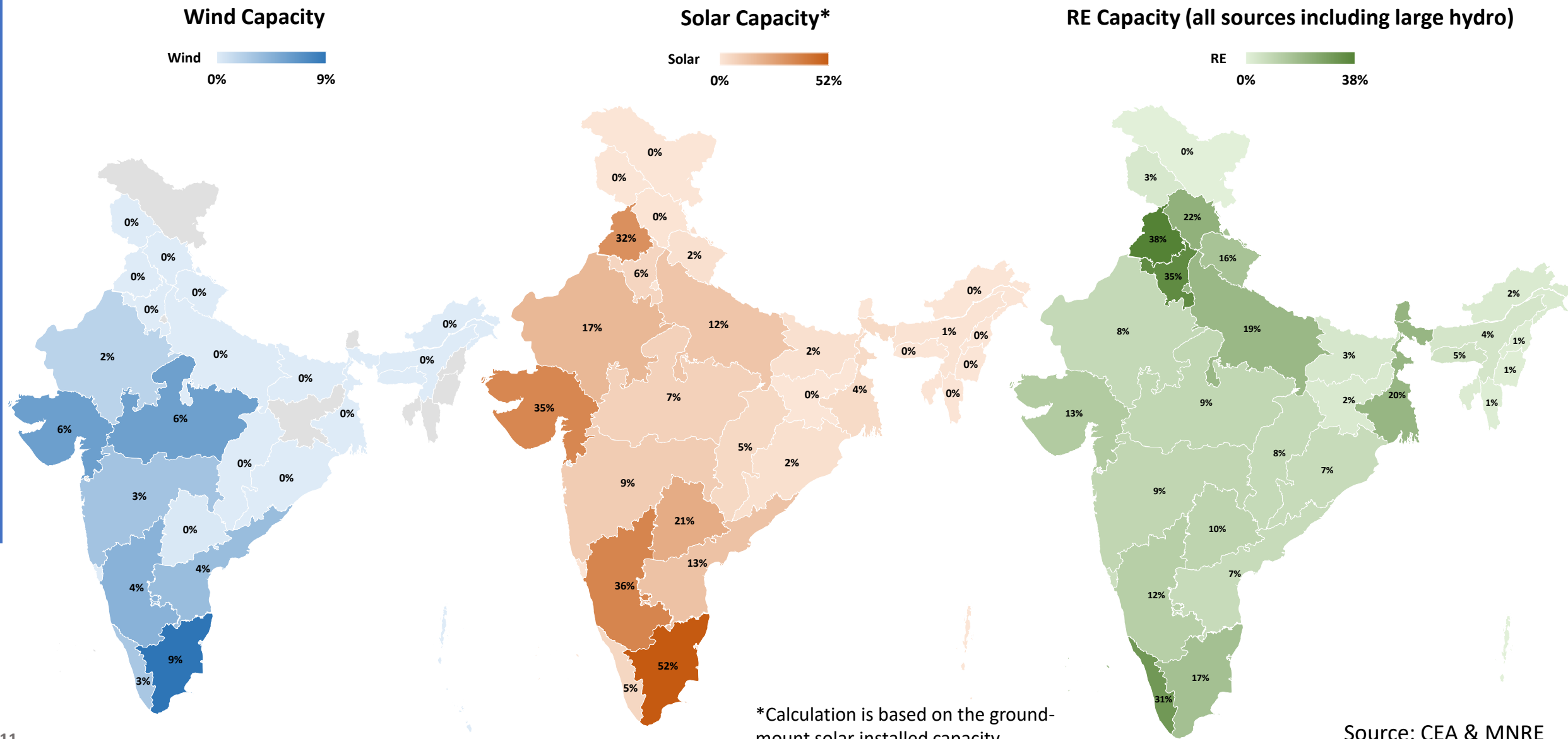


National Potential (MNRE)- 2181 GW

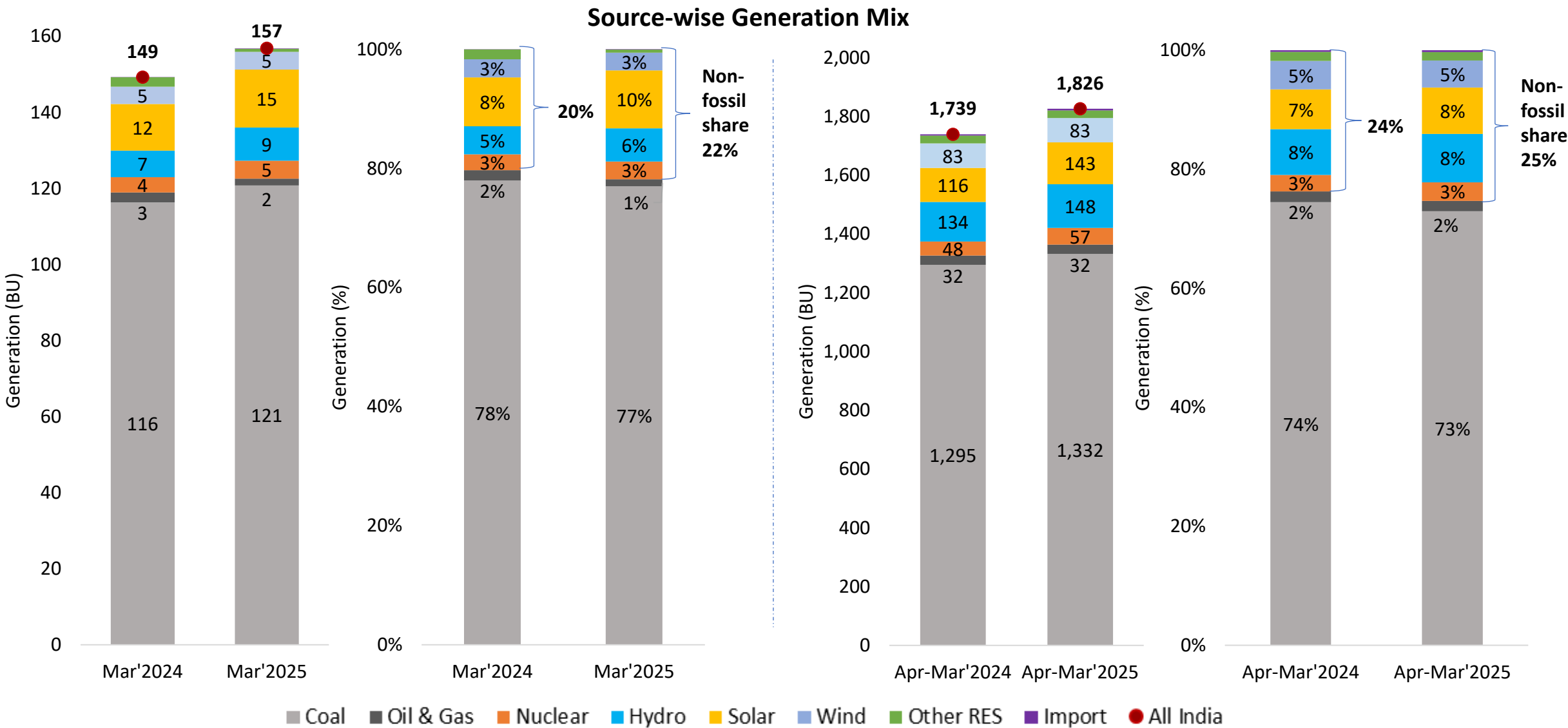
Source- MNRE

Renewable Energy (RE) Potential and Installed Capacity (2/2)

RE Installed capacity as a Percentage of the total resource potential in the state as on March 2025



India's Electricity Generation Mix

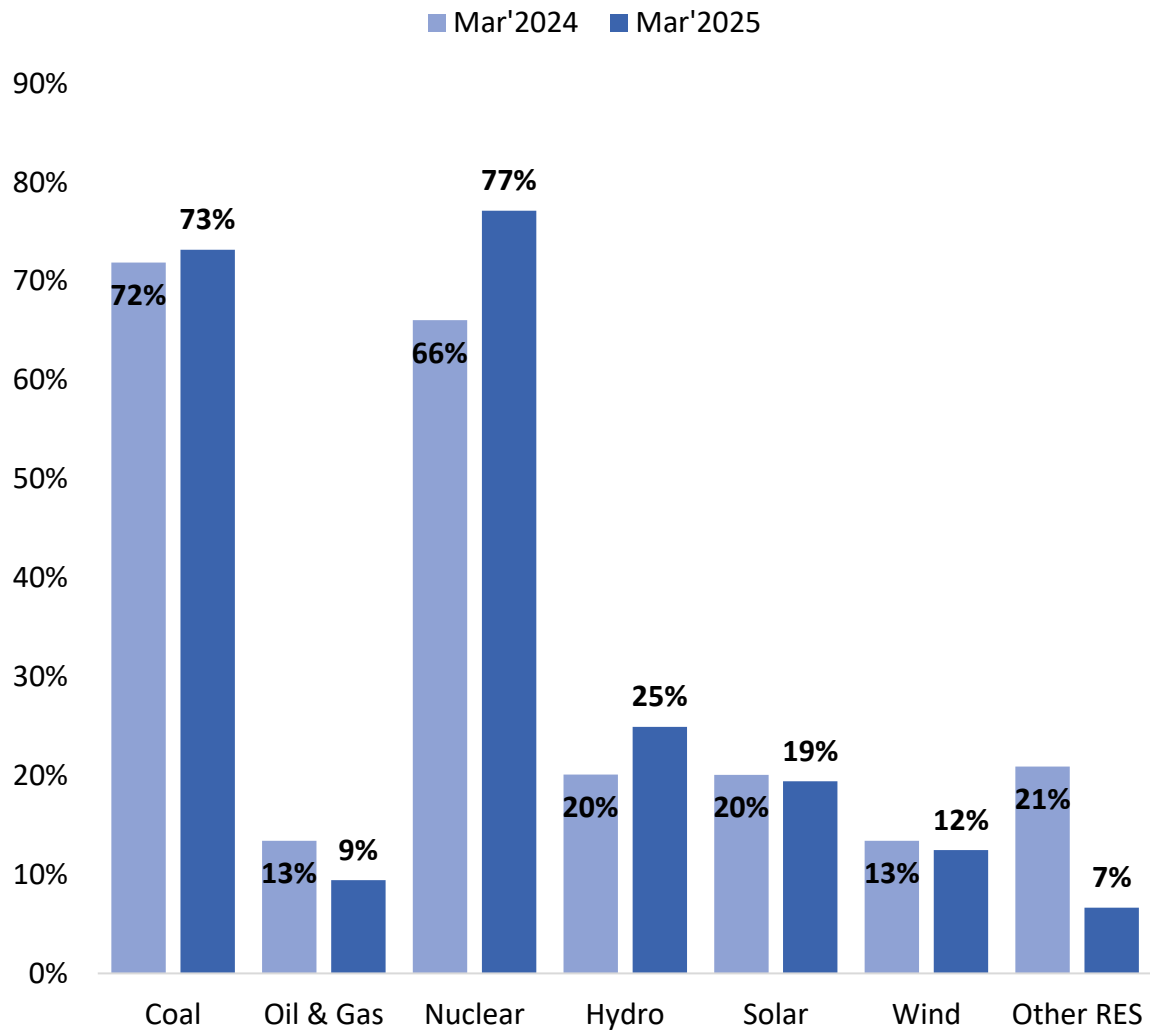


NOTE: The generation data for March'2025 is provisional.

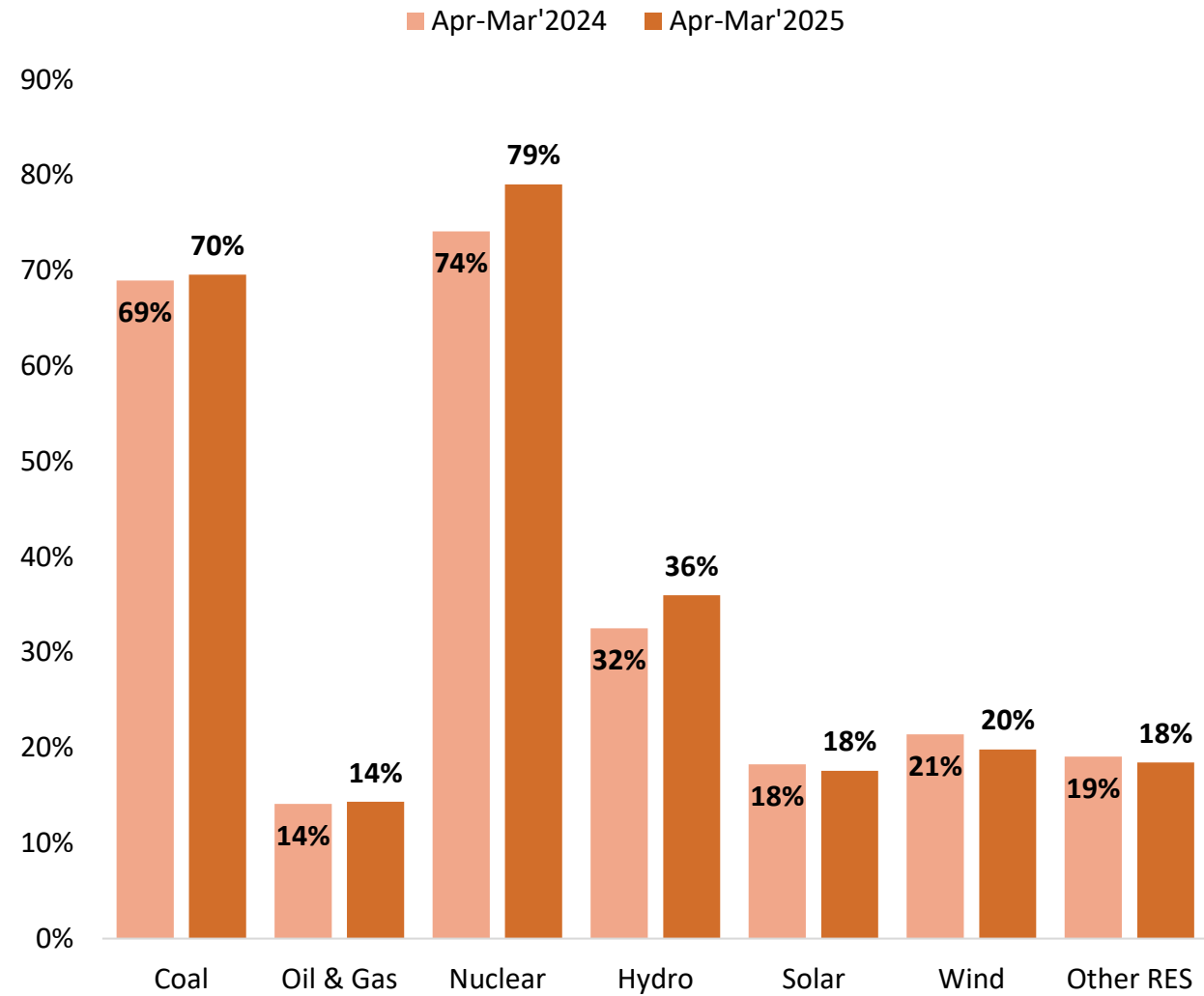
Source: CEA

Source-wise PLF/CUF

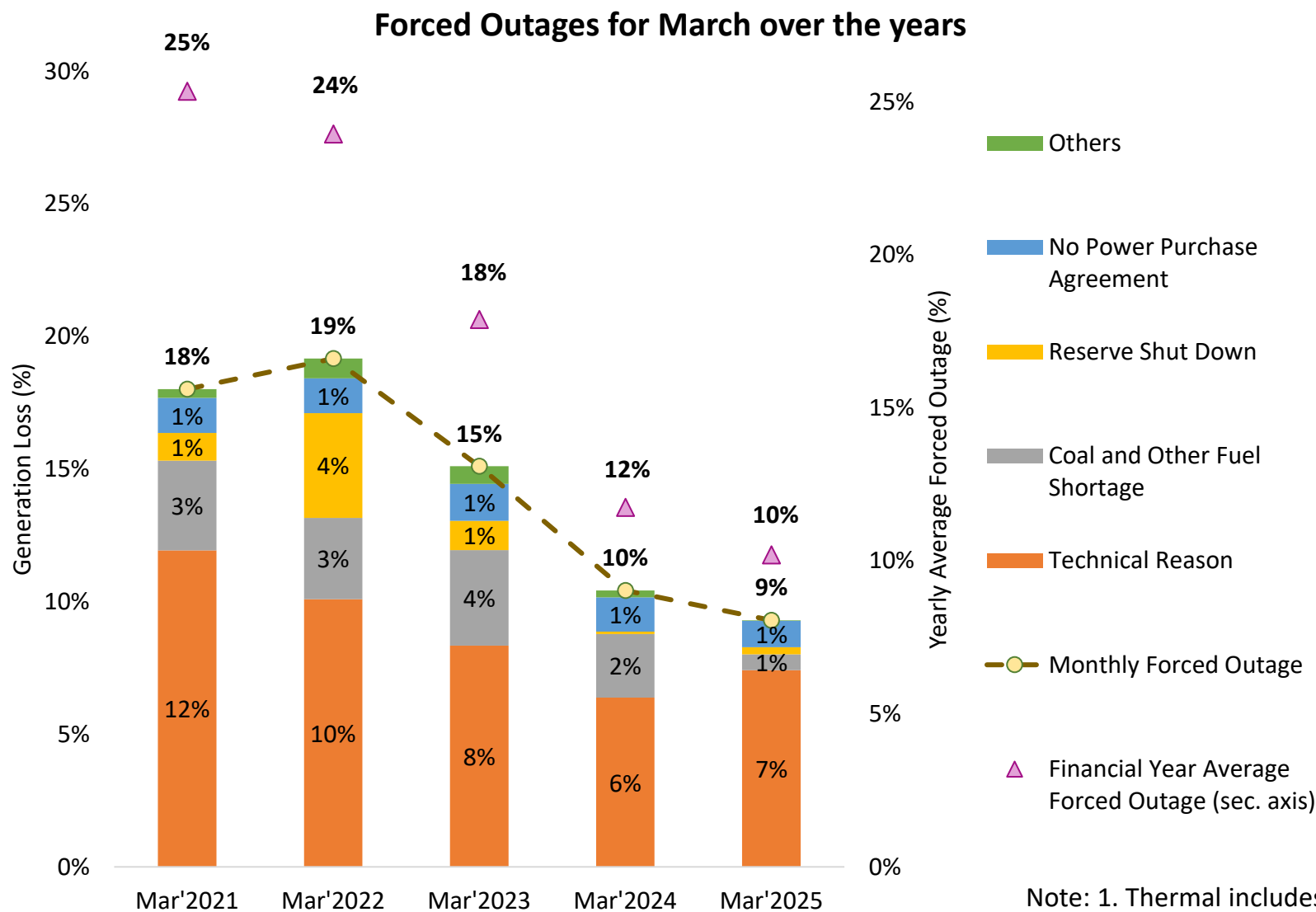
Source-wise PLF/ CUF in March (%)



Source-wise PLF/ CUF Comparison (%)



Thermal Generation Loss and Reasons for Forced Outages



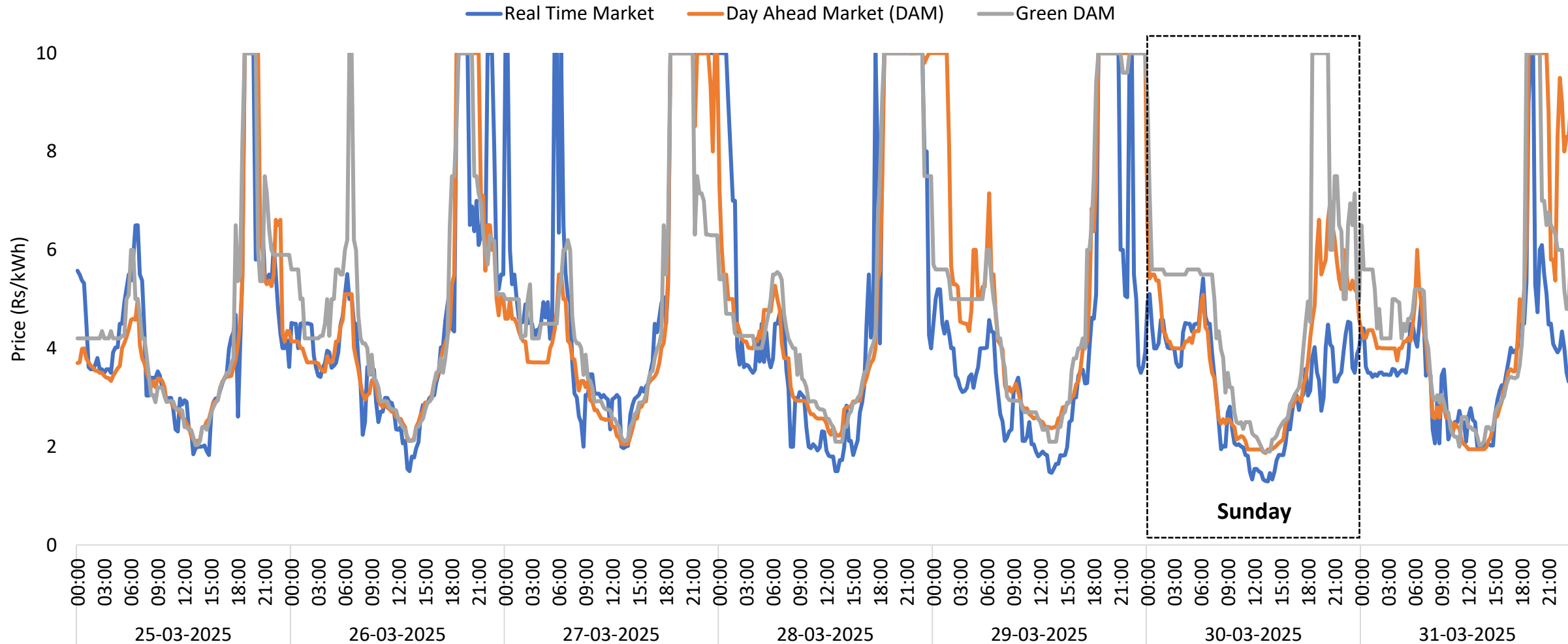
| Year/ Month | | Average Forced Outage Share |
|-------------|------------|-----------------------------|
| Yearly | FY 2022-23 | 18% |
| | FY 2023-24 | 12% |
| | FY 2024-25 | 10% |
| Monthly | Mar'2023 | 15% |
| | Mar'2024 | 10% |
| | Mar'2025 | 9% |

Note: 1. Thermal includes only Coal and Lignite Plants.
2. Others includes Raw Water Unavailability, Technical Grid, and Other Commercial Reasons

Source: ICED

Indian Electricity Exchange (IEX) Market Snapshot

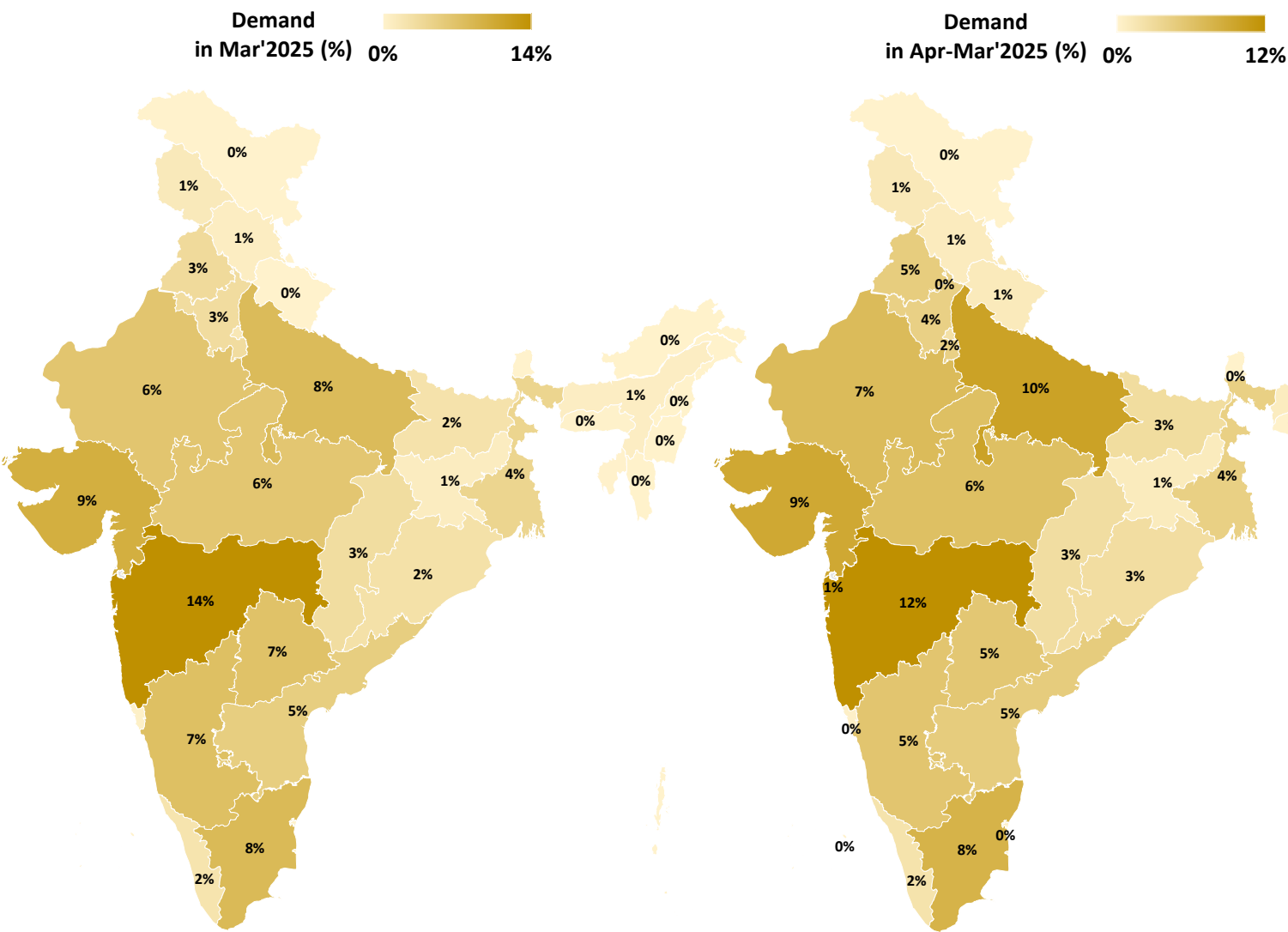
Market Clearing Prices of last 7 days of March 2025



In April 2023, CERC revised the price ceiling from ₹12/kWh to ₹10/kWh in the power exchange market.

National and State level Electricity Demand

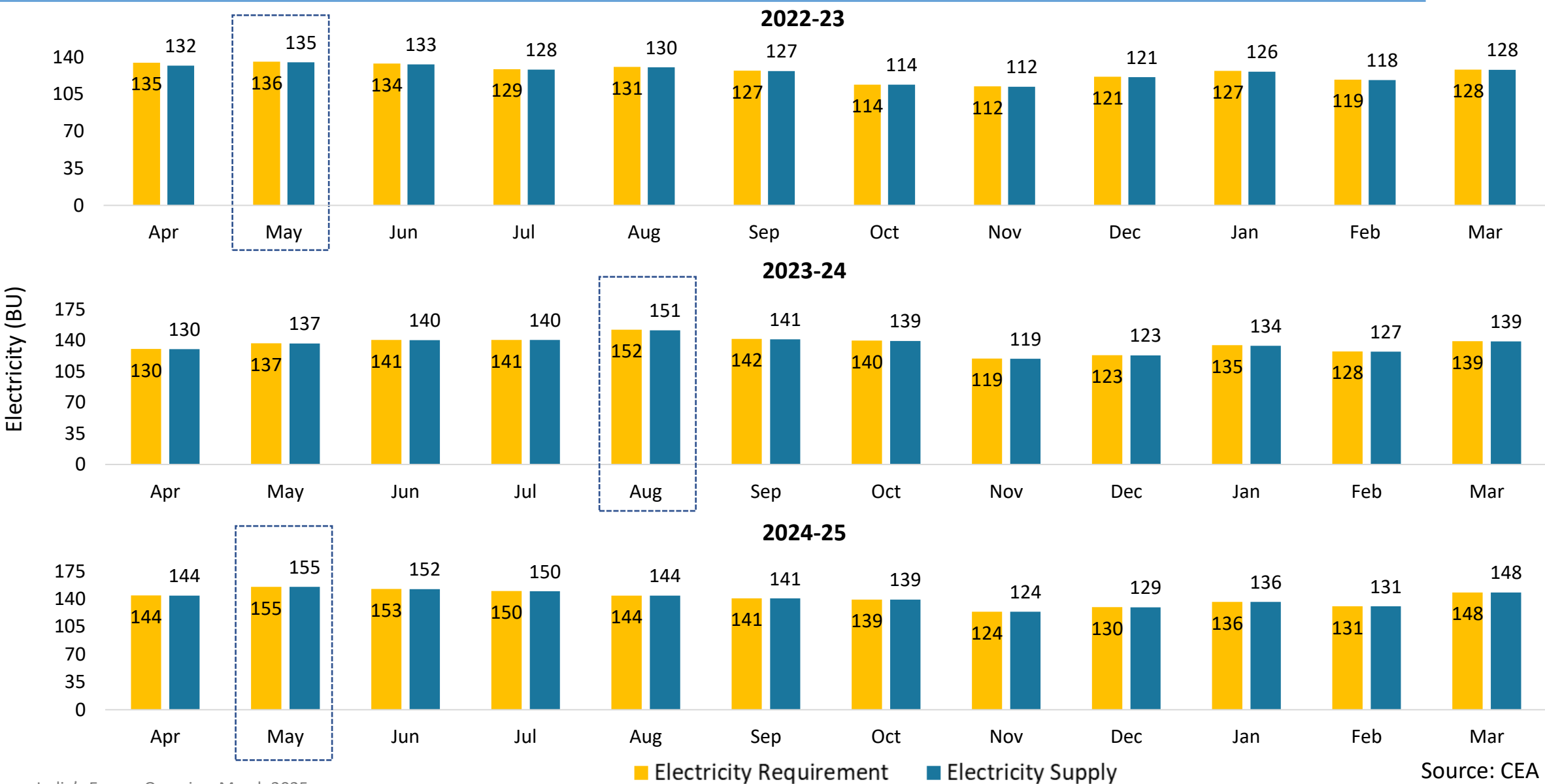
State-level Electricity Demand as a percent of National Demand (%)



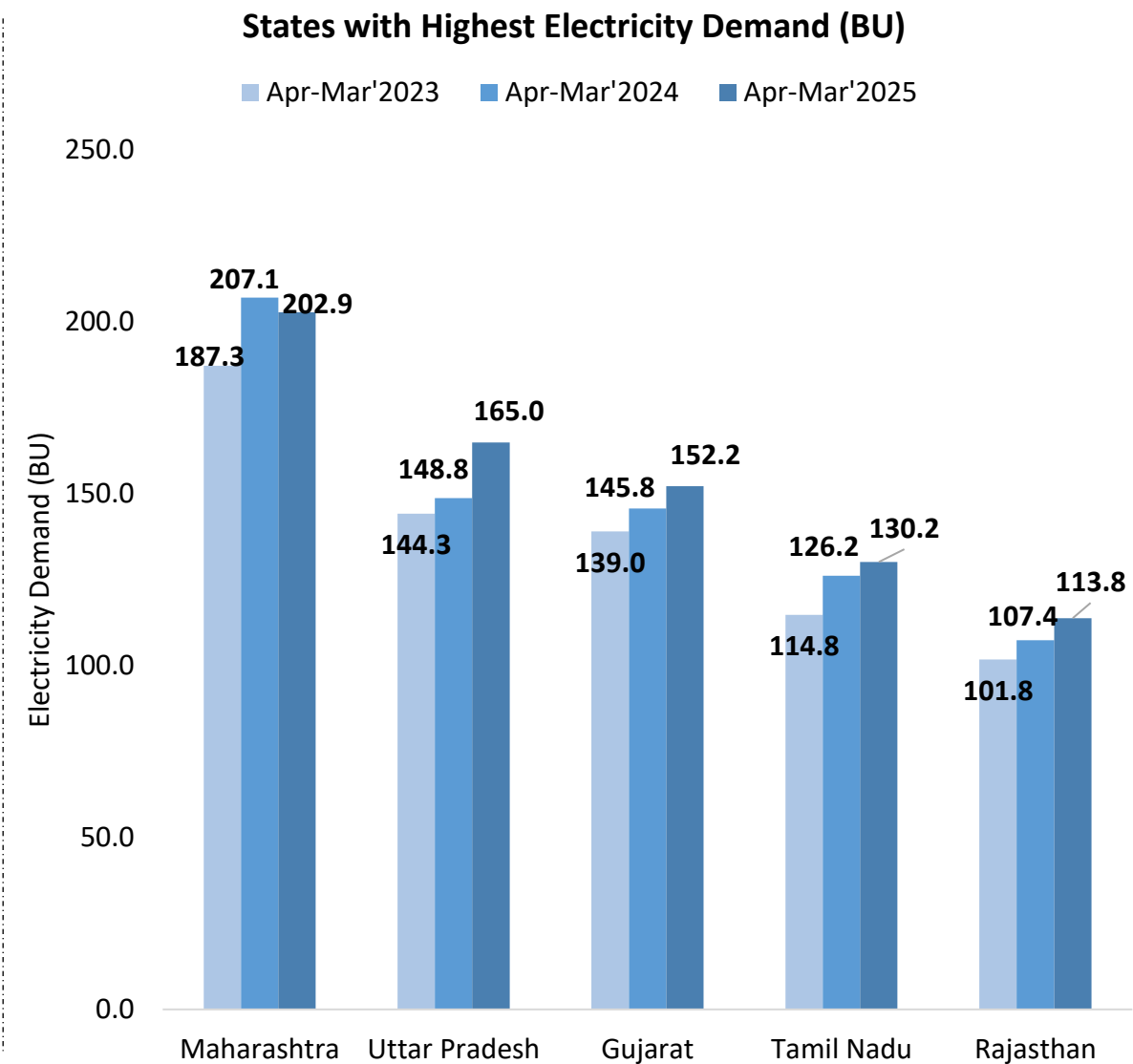
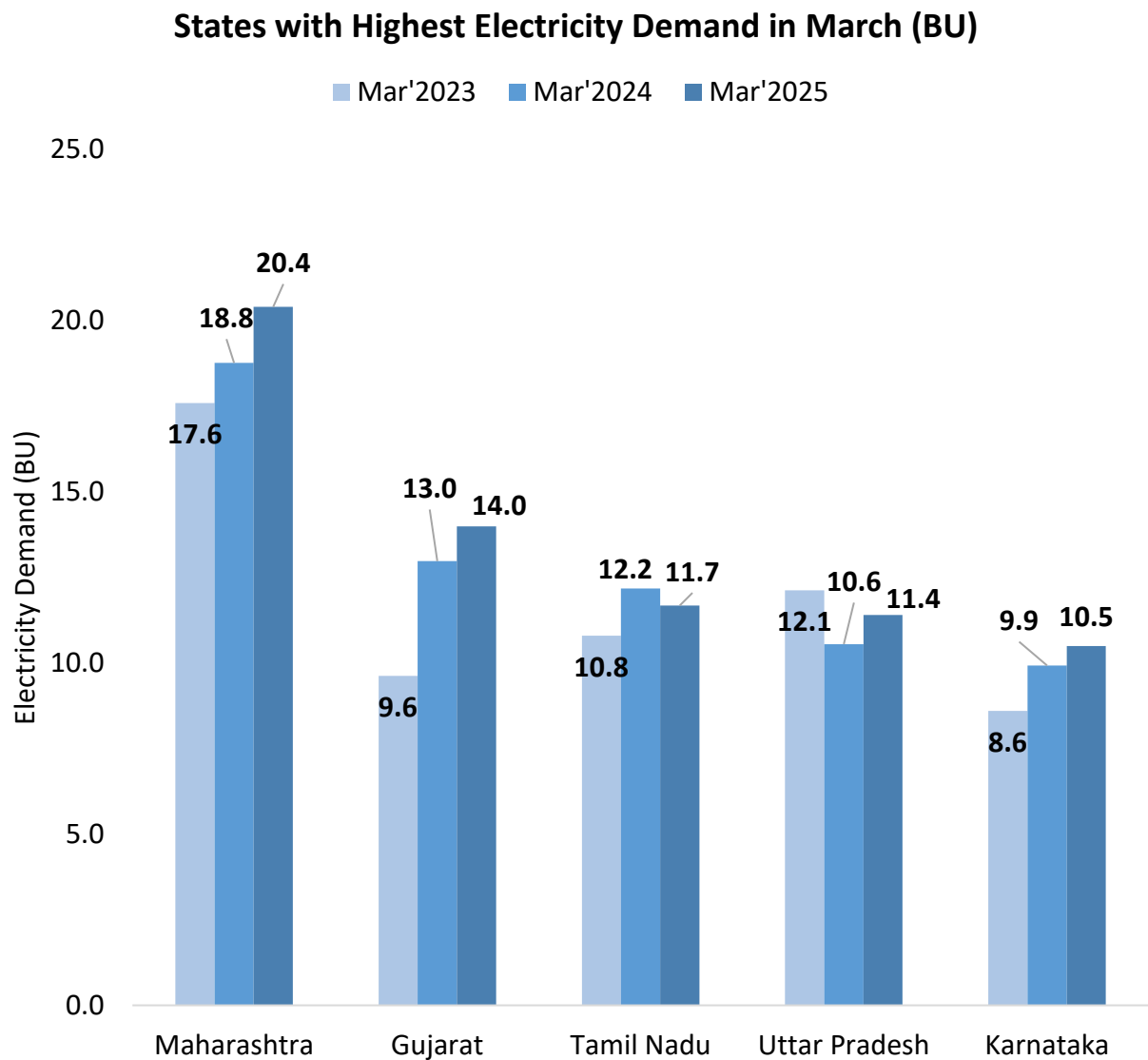
| Month | Electricity Demand (BU) | Electricity Supply (BU) | Gap (BU) (+/-) |
|----------|-------------------------|-------------------------|----------------|
| Mar'2023 | 128 | 128 | 0.2 |
| Mar'2024 | 139 | 139 | 0.1 |
| Mar'2025 | 148 | 148 | 0.0 |

| Apr-Mar | Electricity Demand (BU) | Electricity Supply (BU) | Gap (BU) (+/-) |
|------------|-------------------------|-------------------------|----------------|
| FY 2022-23 | 1,513 | 1,506 | 7.6 |
| FY 2023-24 | 1,626 | 1,622 | 4.1 |
| FY 2024-25 | 1,695 | 1,694 | 1.6 |

India's Monthly Electricity Requirement and Supply



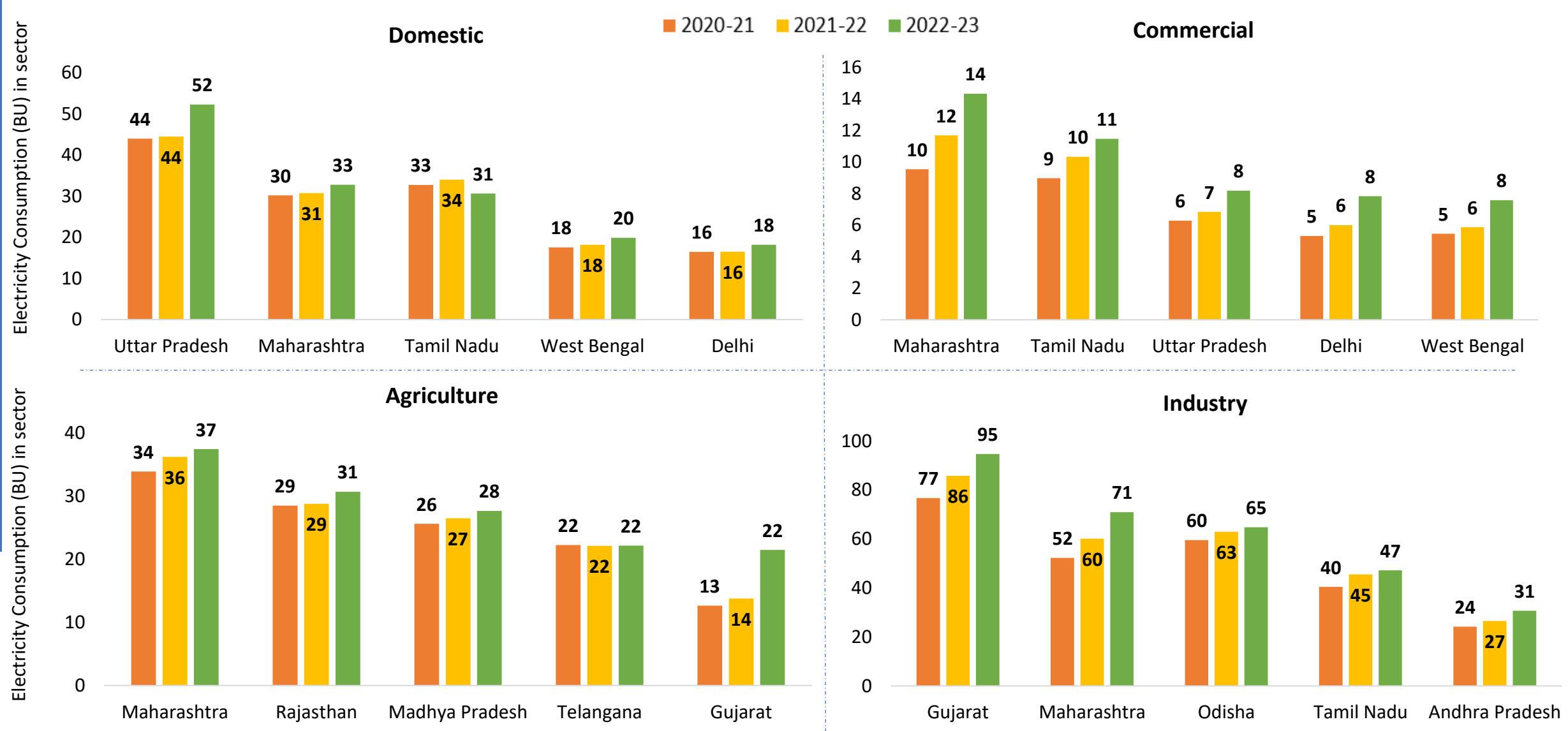
Monthly Electricity Demand of the top 5 states



Note: The electricity demand data for March'25 is Provisional.

Source: CEA

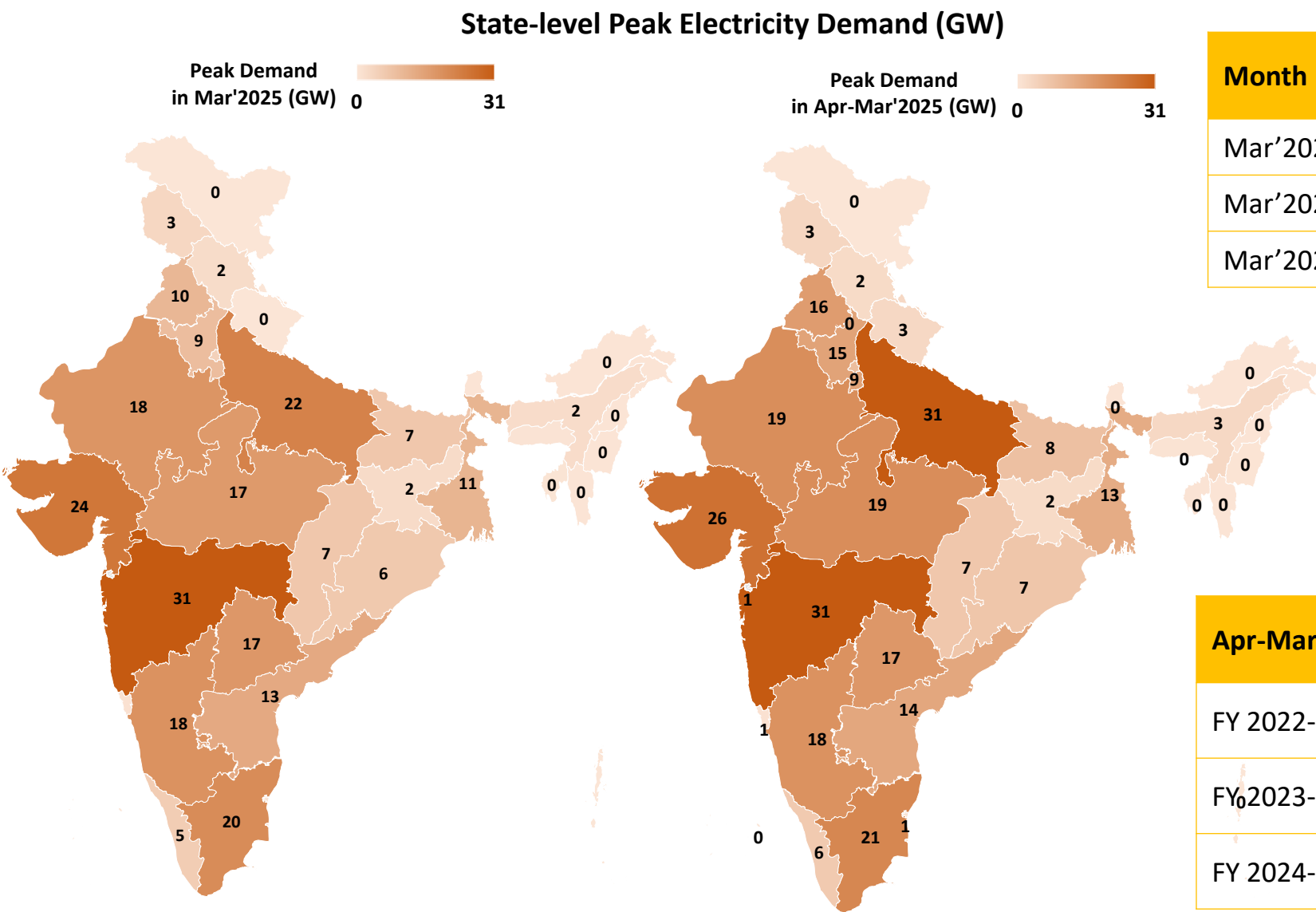
Electricity Consumer-category wise top 5 States



NOTE: Top 5 States under consumer-categories are selected on the basis of 2022-23

Source: CEA

National and State level Peak Electricity Demand



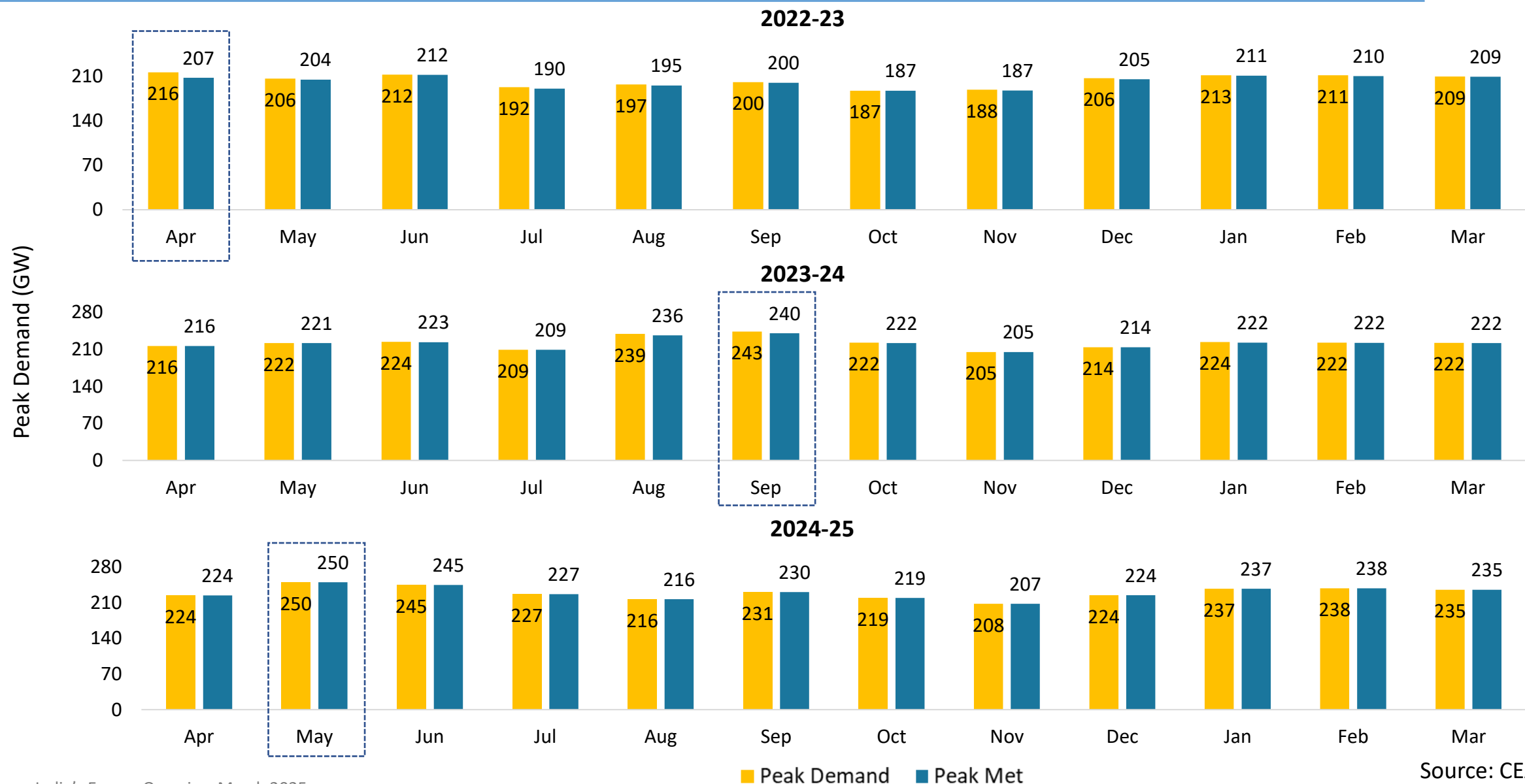
| Month | Peak Demand (GW) | Peak Supply (GW) | Gap(GW) (+/-) |
|----------|------------------|------------------|---------------|
| Mar'2023 | 209 | 209 | 0.4 |
| Mar'2024 | 222 | 222 | 0.1 |
| Mar'2025 | 235 | 235 | 0.0 |

| Apr-Mar | Peak Demand (GW) | Peak Supply (GW) | Gap (GW) (+/-) |
|-------------------------|------------------|------------------|----------------|
| FY 2022-23 | 216 | 207 | 8.7 |
| FY ₀ 2023-24 | 243 | 240 | 3.3 |
| FY 2024-25 | 250 | 250 | 0.0 |

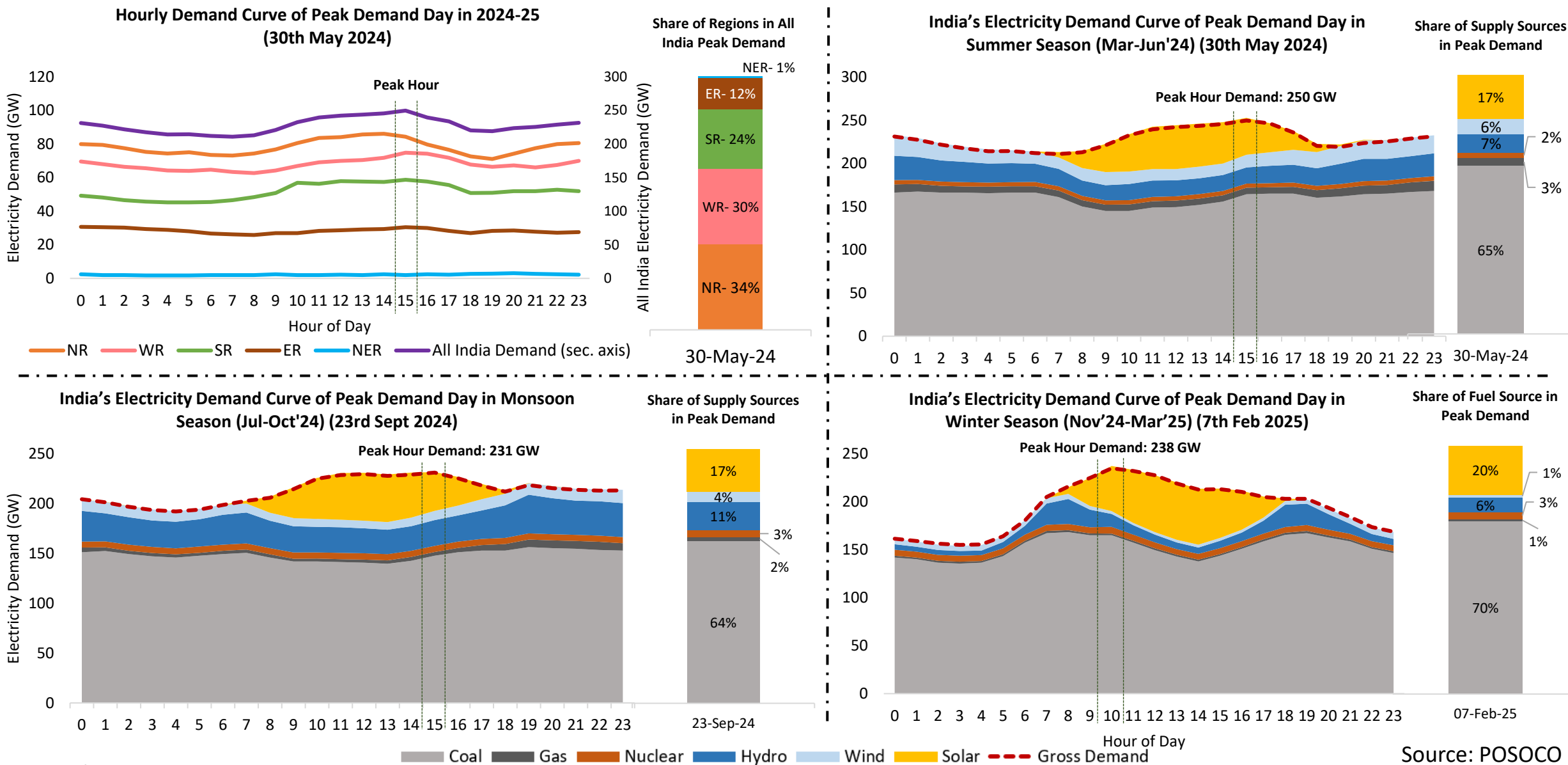
Note: The peak electricity demand data for March'25 is Provisional.

Source: CEA

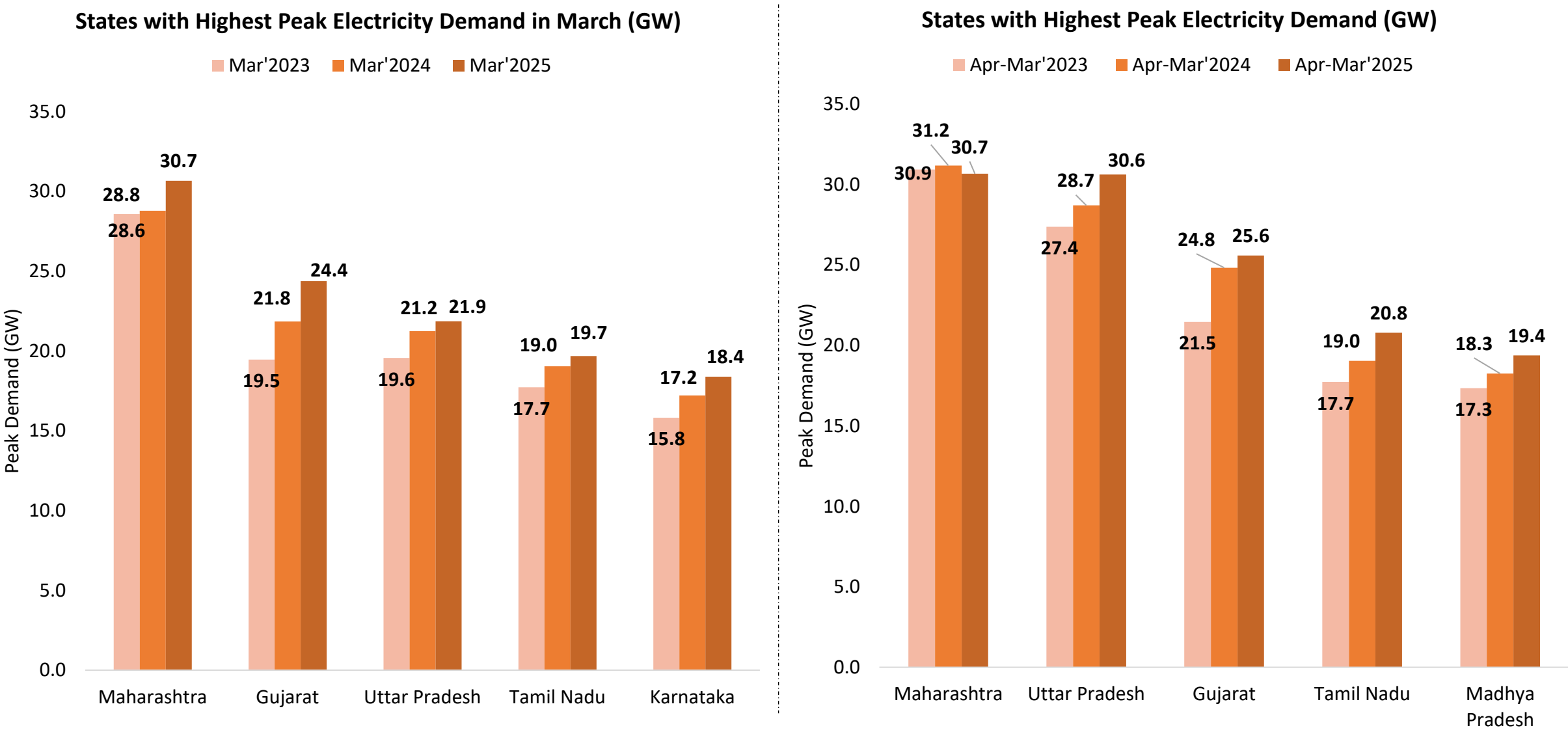
India's Monthly Peak Electricity Demand and Supply



All India, Regional, and Seasonal Electricity Demand Curve of Peak Demand Day



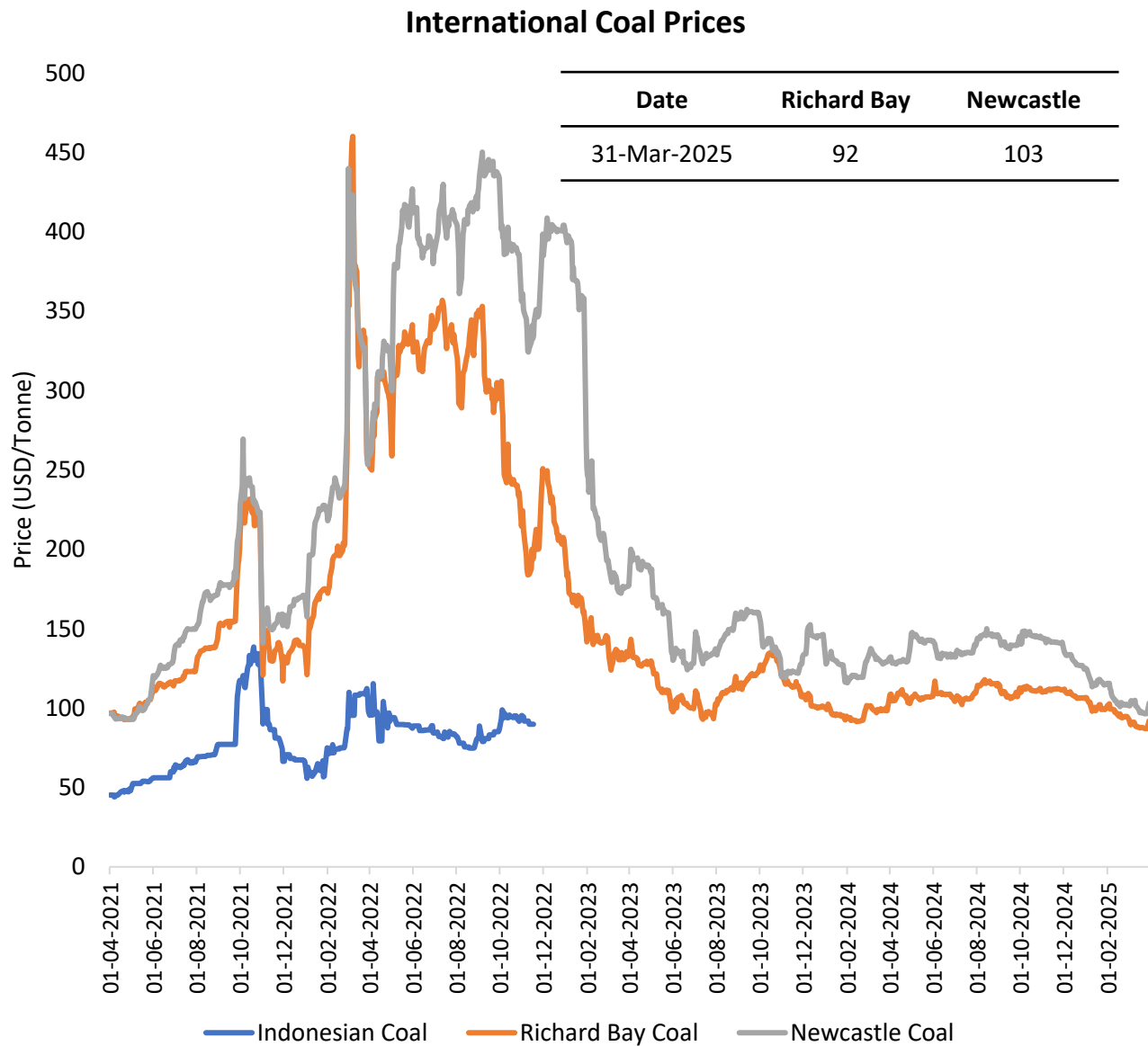
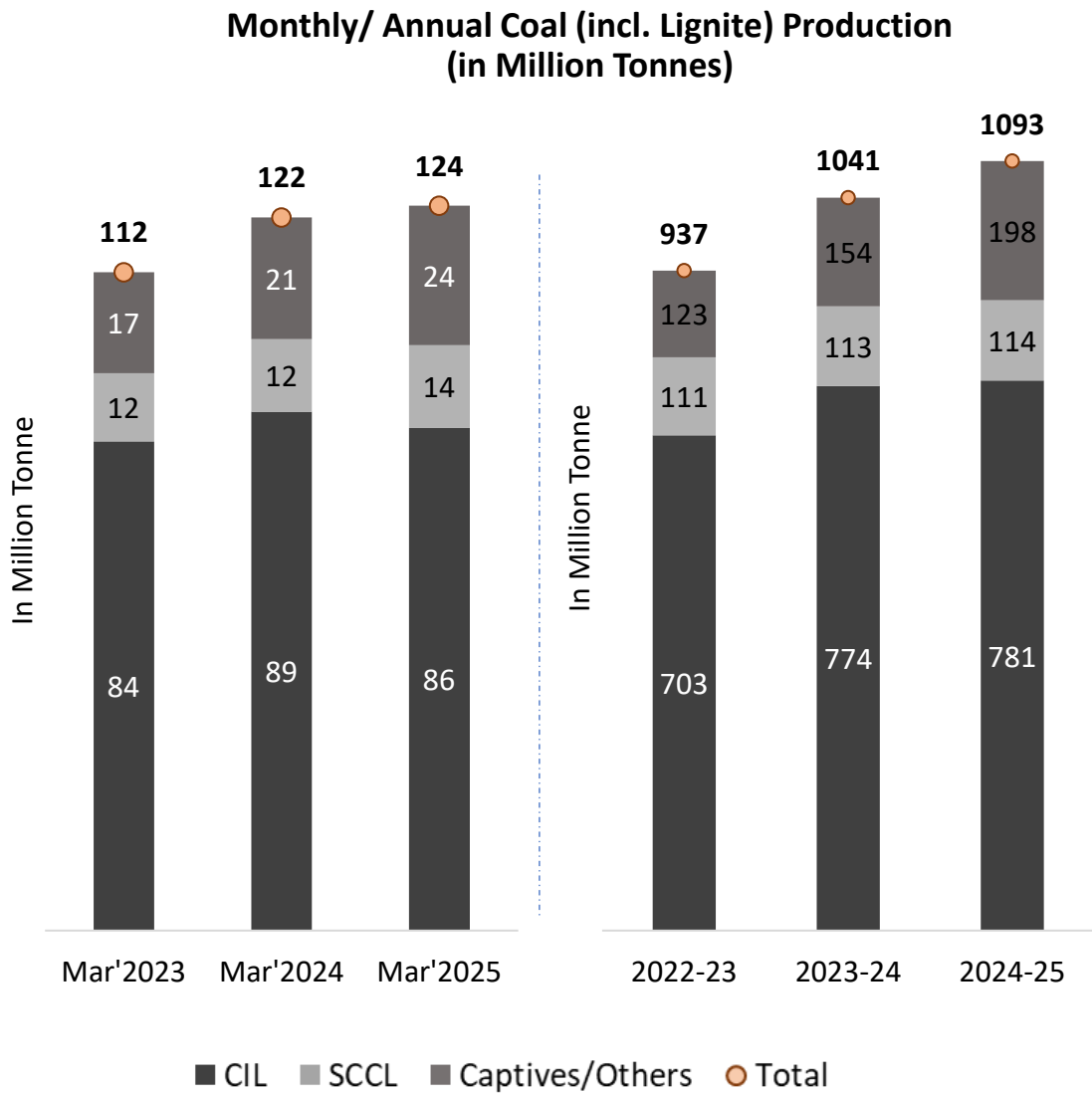
Monthly Peak Electricity Demand of the top 5 states



Note: The peak electricity demand data for March'25 is Provisional.

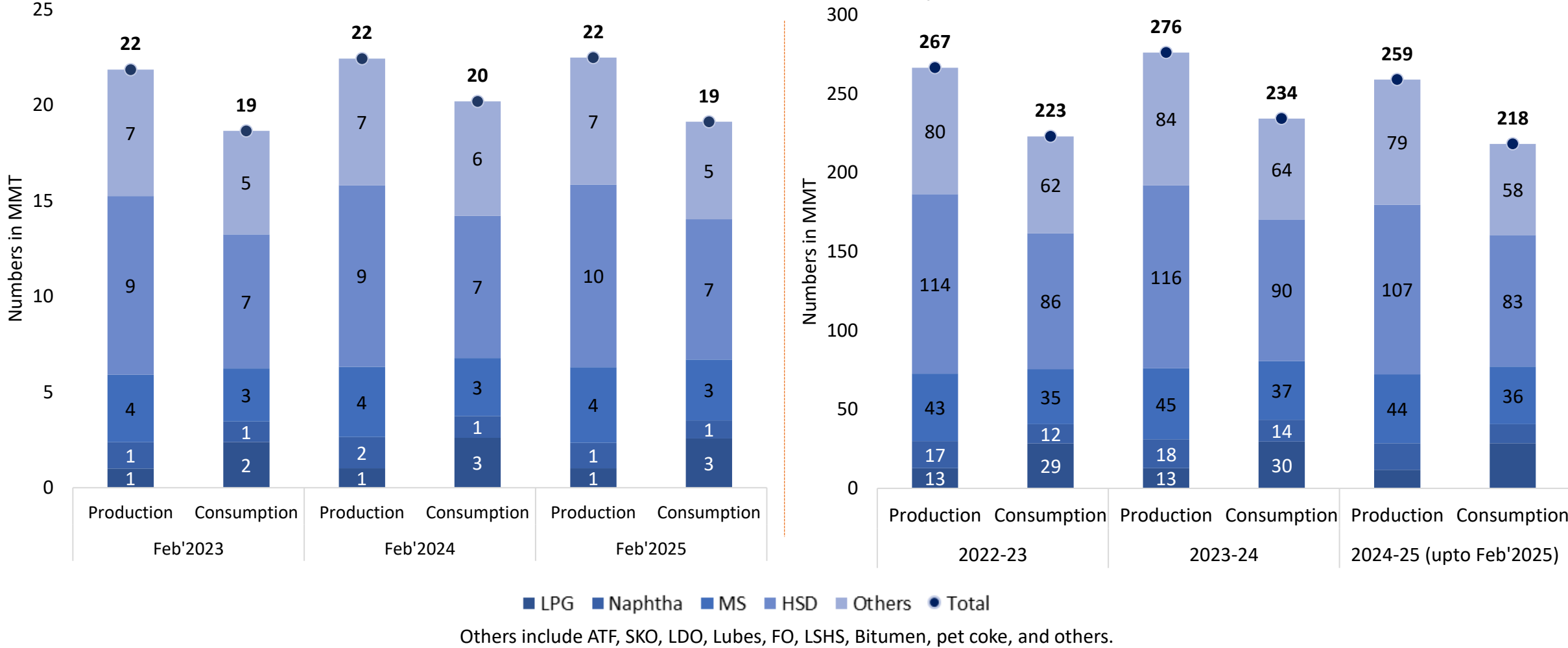
Source: CEA

Monthly Coal Statistics



Petroleum Products Market Scenario (1/3)

Petroleum Product-wise Production & Consumption (MMT)



Abbreviations: ATF- Aviation Turbine Fuel, FO- Furnace Oil, HSD- High-Speed Diesel, LDO- Light Diesel Oil, MS- Motor Spirit (Petrol), SKO- Superior Kerosene Oil, LSHS- Low Sulphur Heavy Stock, LPG- Liquefied Petroleum Gas, MMT- Million Metric Tonne

Petroleum Products Market Scenario (2/3)

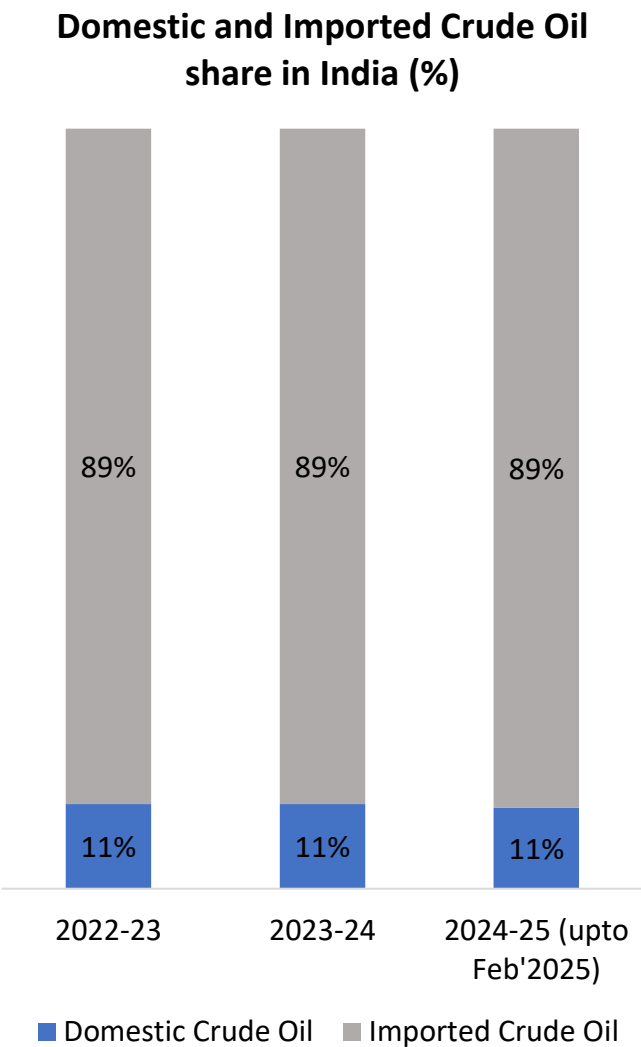
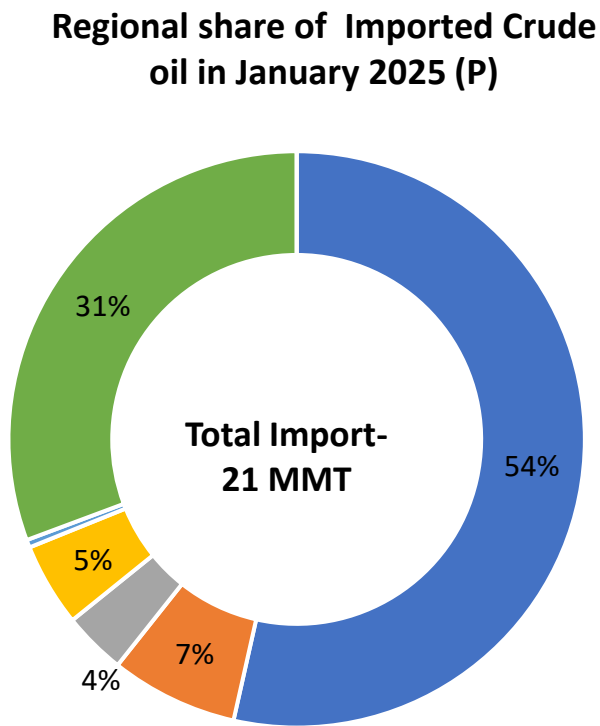
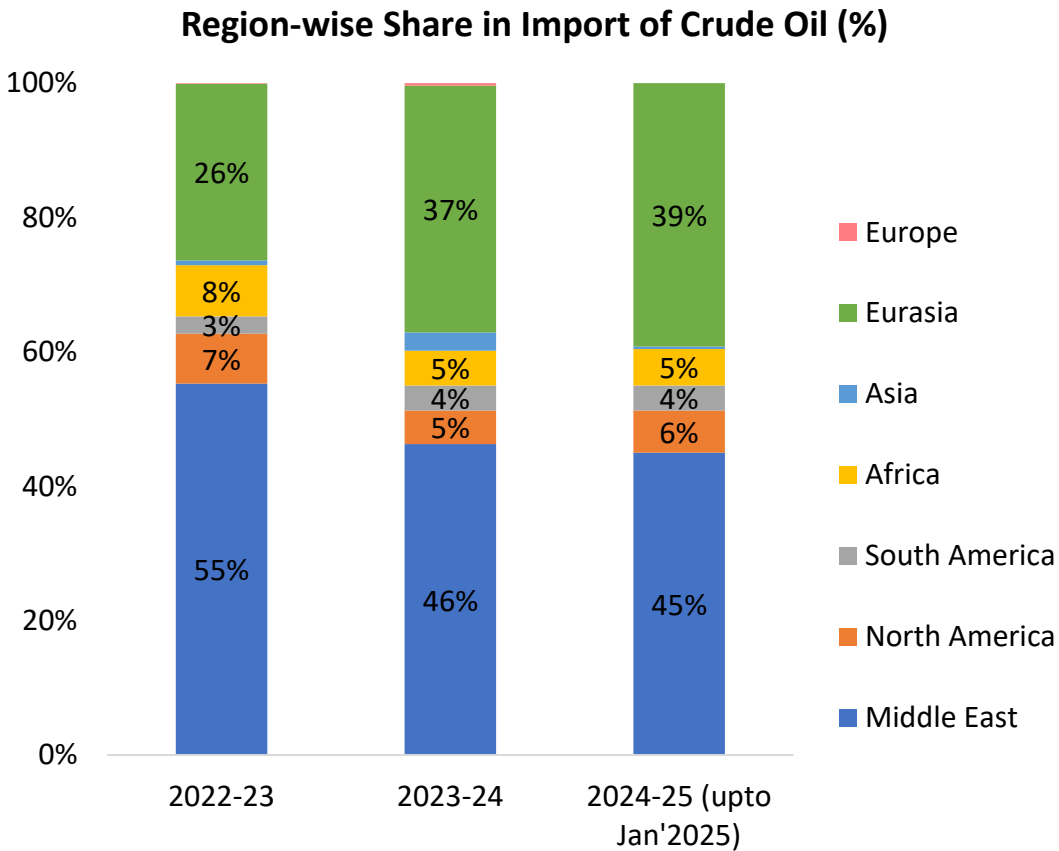
| Import/Export of Crude Oil and Petroleum Products ('000 Tonnes) | | | | | | | |
|---|----------------|---------|--------|--------|---------|---------|-------------------------|
| Petroleum Products | Import/ Export | Monthly | | | Yearly | | |
| | | Feb'23 | Feb'24 | Feb'25 | 2022-23 | 2023-24 | 2024-25 (upto Feb'2025) |
| Crude Oil | Import | 19285 | 18244 | 19095 | 232700 | 234262 | 219928 |
| | Export | 0 | 0 | 0 | 0 | 0 | 0 |
| | Net Import | 19285 | 18244 | 19095 | 232700 | 234262 | 219928 |
| LPG | Import | 1647 | 1750 | 1526 | 18335 | 18514 | 18992 |
| | Export | 43 | 45 | 49 | 540 | 525 | 501 |
| | Net Import | 1604 | 1705 | 1477 | 17796 | 17989 | 18491 |
| Diesel | Import | 10 | 11 | 4 | 322 | 42 | 40 |
| | Export | 2151 | 2396 | 2329 | 28494 | 28204 | 25203 |
| | Net Import | -2141 | -2385 | -2325 | -28172 | -28162 | -25163 |
| Petrol | Import | 0 | 0 | 0 | 1069 | 717 | 235 |
| | Export | 1379 | 1256 | 1687 | 13127 | 13472 | 14062 |
| | Net Import | -1379 | -1256 | -1687 | -12058 | -12755 | -13828 |
| Others | Import | 2062 | 2766 | 2202 | 24871 | 29419 | 27547 |
| | Export | 1485 | 1620 | 1563 | 18854 | 20391 | 19185 |
| | Net Import | 576 | 1146 | 639 | 6017 | 9029 | 8362 |

*Others include ATF, Naphtha, SKO, LDO, Lubes, FO, LSHS, Bitumen, pet coke, and others.

NOTE: The data is available latest up to February'2025

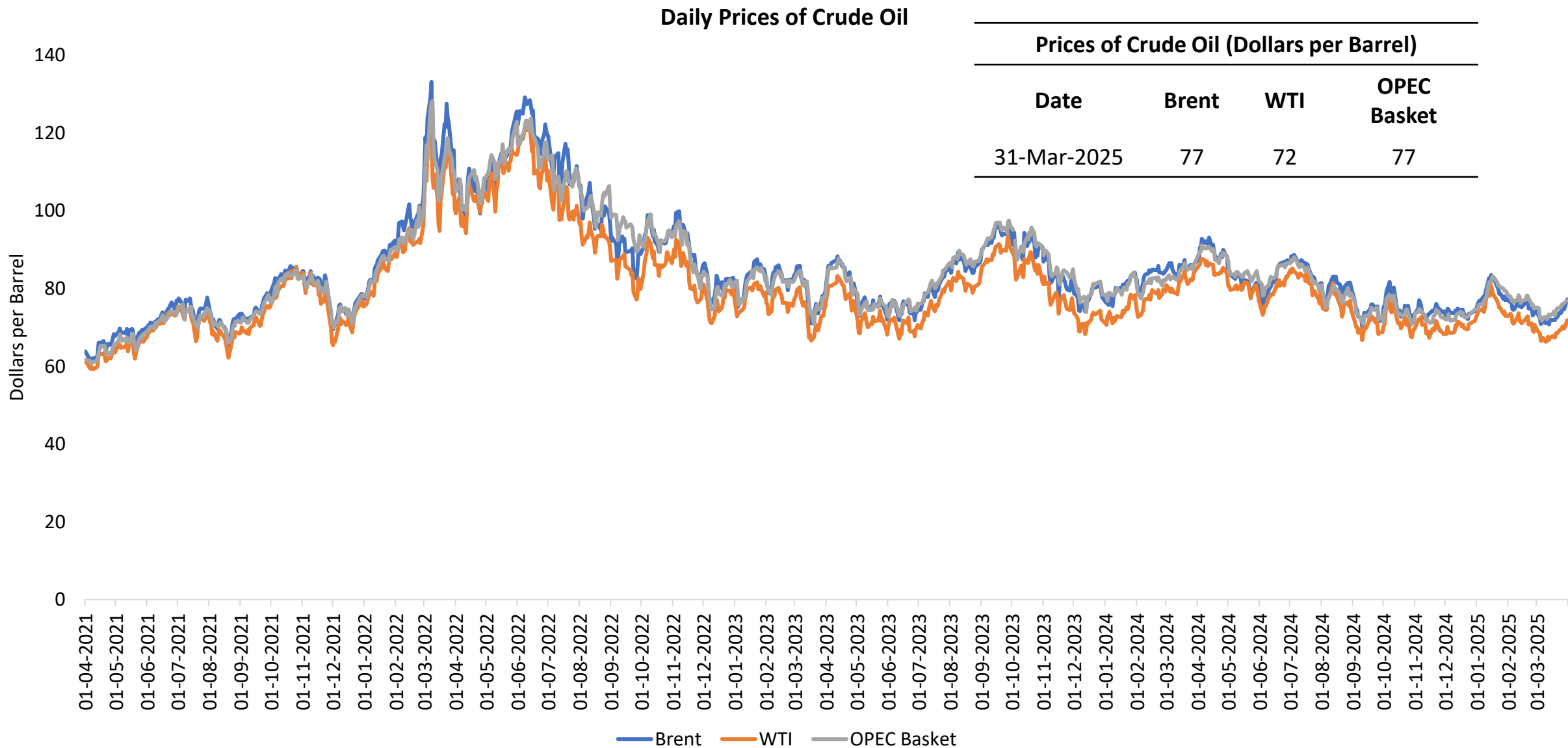
Source: PPAC

Petroleum Products Market Scenario (3/3)

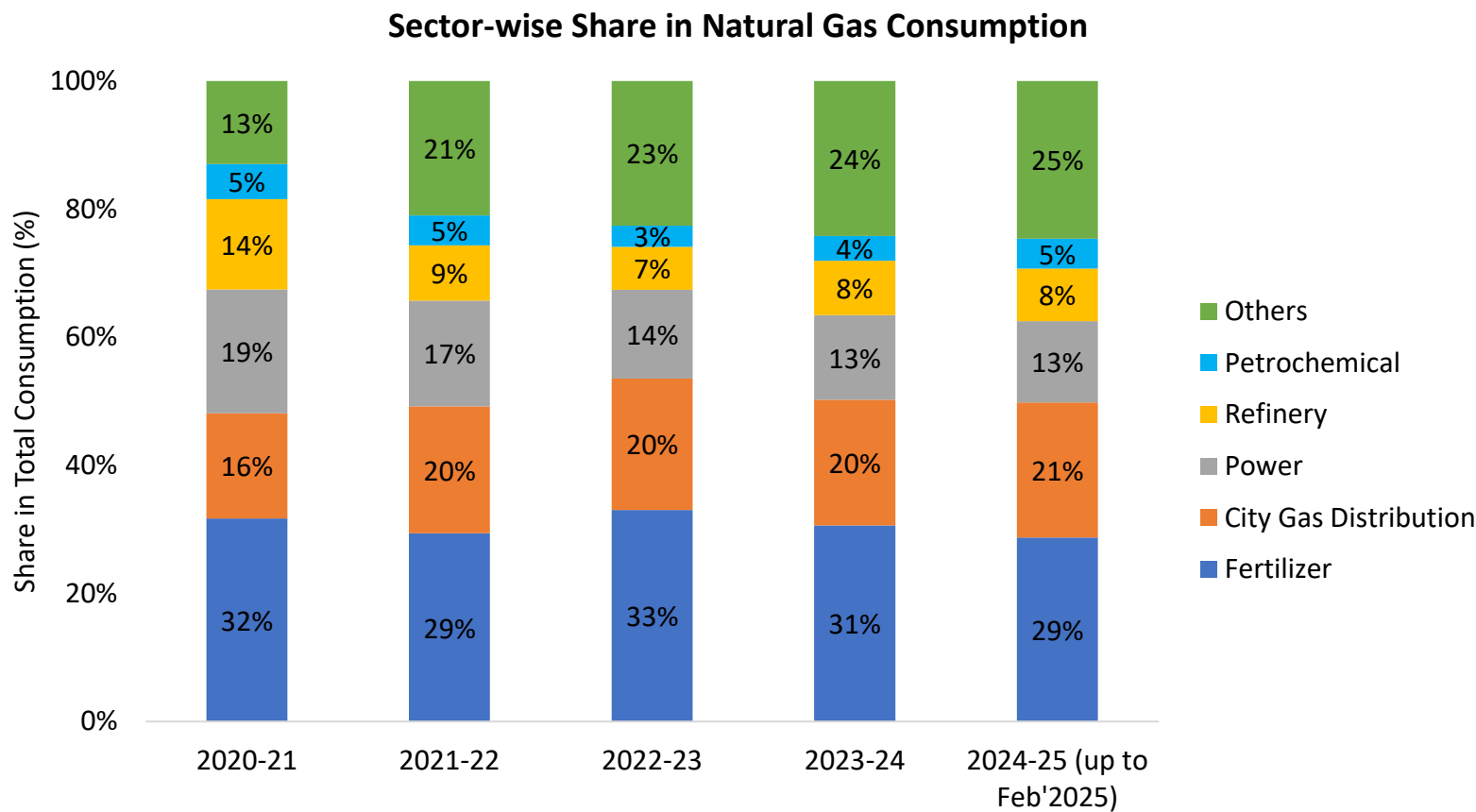


| Total Import of Crude Oil (MMT) | | | |
|---------------------------------|---------|---------|--------------------------|
| Total Import | 2022-23 | 2023-24 | 2024-25 (up to Feb'2025) |
| Crude Oil | 233 | 234 | 220 |

Daily Prices of Crude Oil

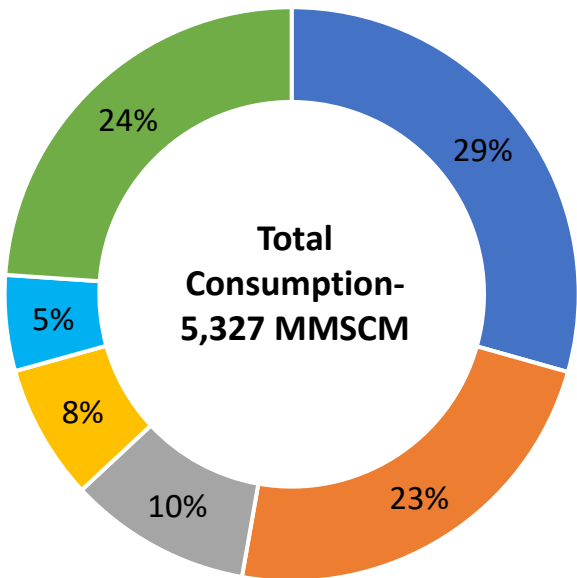


Gas Market Scenario (1/2)



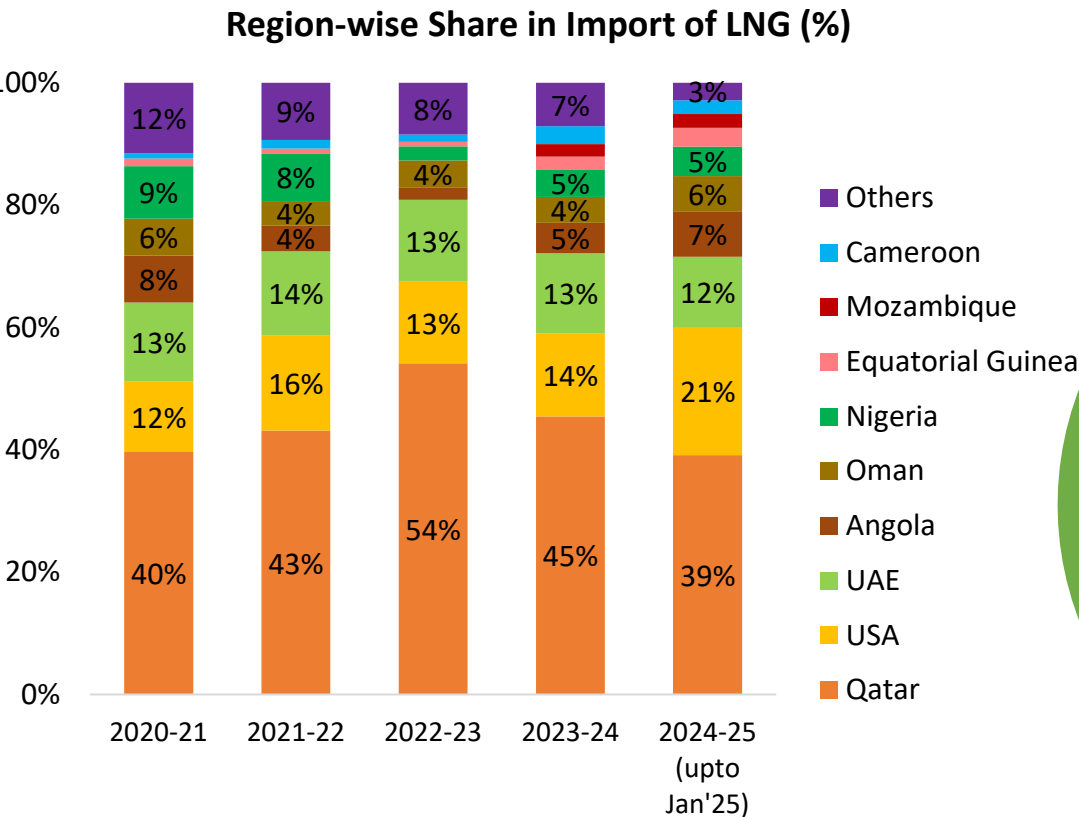
| Total Consumption of Natural Gas (NG) (MMSCM) | | | | | |
|---|---------|---------|---------|---------|--------------------------|
| Total Consumption | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 (up to Feb'2025) |
| Natural Gas | 56,116 | 61,491 | 58,702 | 68,759 | 65,483 |

Sector-wise share in Natural Gas Consumption in February 2025



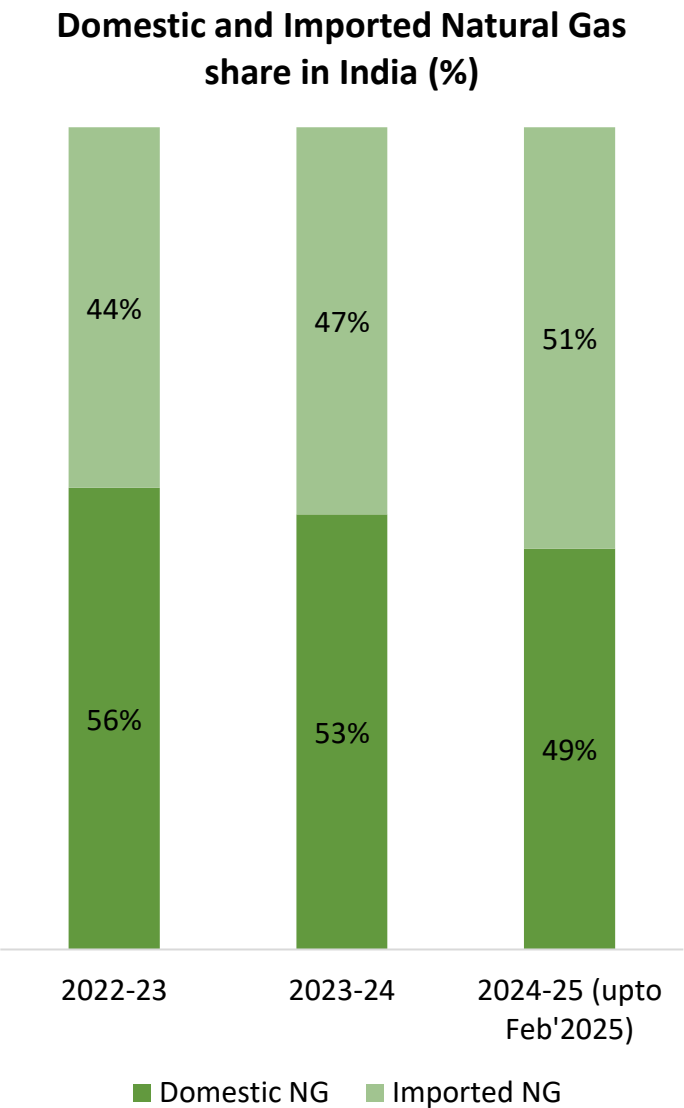
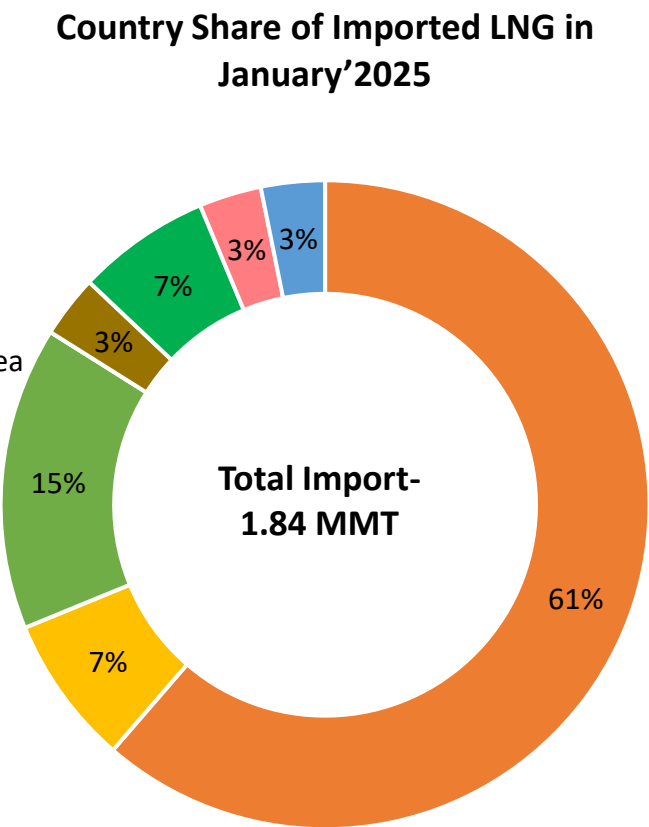
Others include- Internal Combustion of Pipeline System, Industrial, Sponge iron/steel, LPG shrinkage, Manufacturing, Agriculture (tea plantation), Others

Gas Market Scenario (2/2)



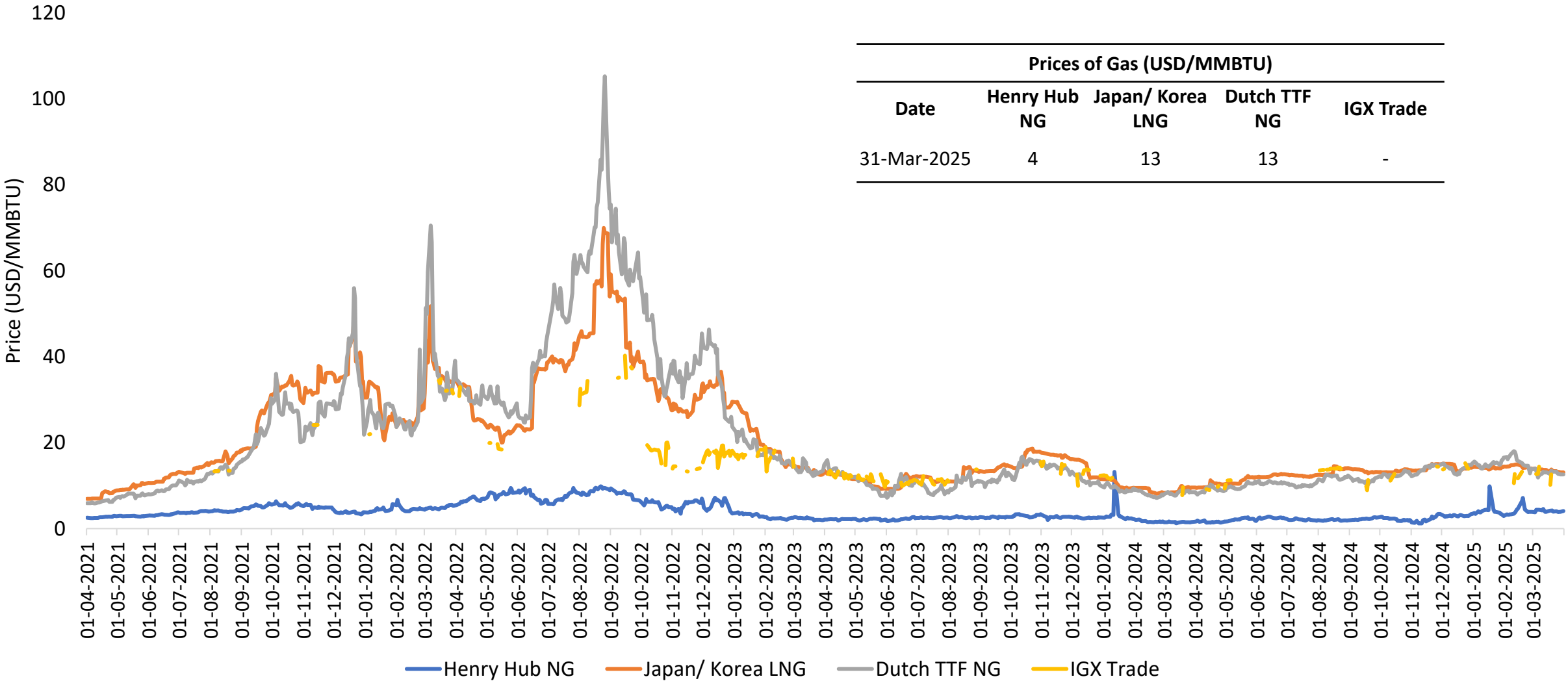
Others include- Trinidad, Cameroon, Egypt, France, Algeria, Belgium, Indonesia, Turkey, Russia, Spain, Malaysia, Brunei, Netherlands, Norway, and others.

| Total Import of Liquified Natural Gas (LNG) (MMT) | | | |
|---|---------|---------|-----------------------------|
| Total Import | 2022-23 | 2023-24 | 2024-25 (up to Feb'2025) |
| LNG | 19.85 | 24.00 | 25.91 |



Daily Prices of Gas

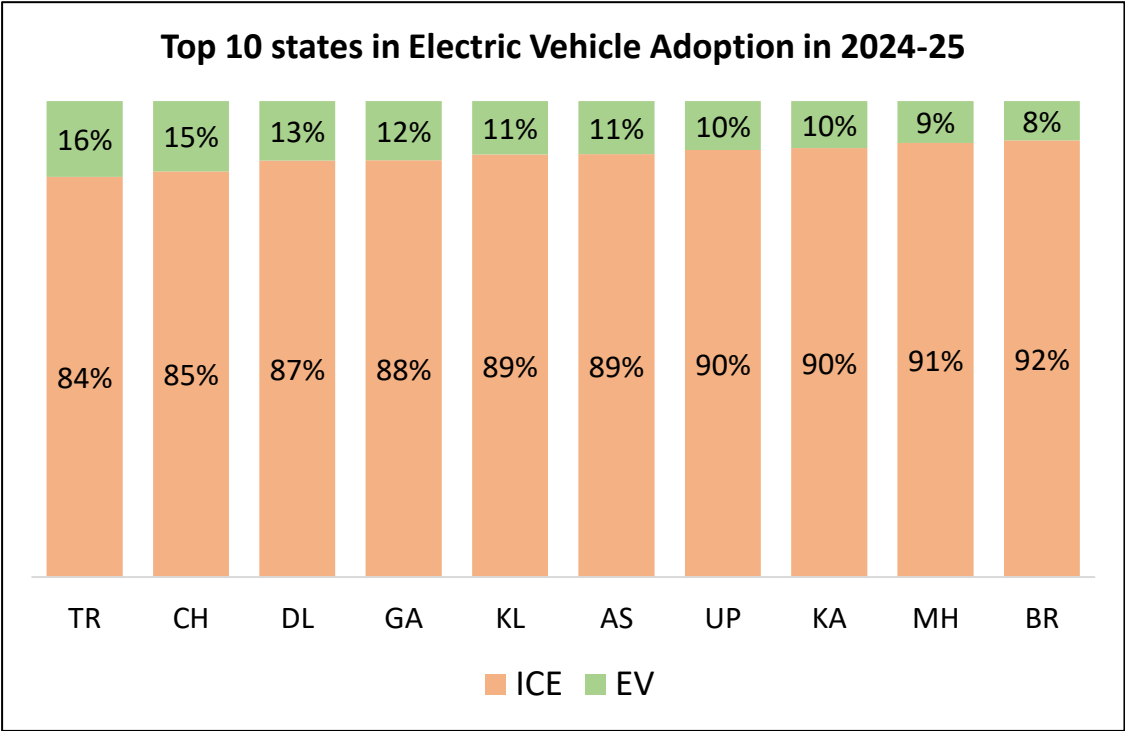
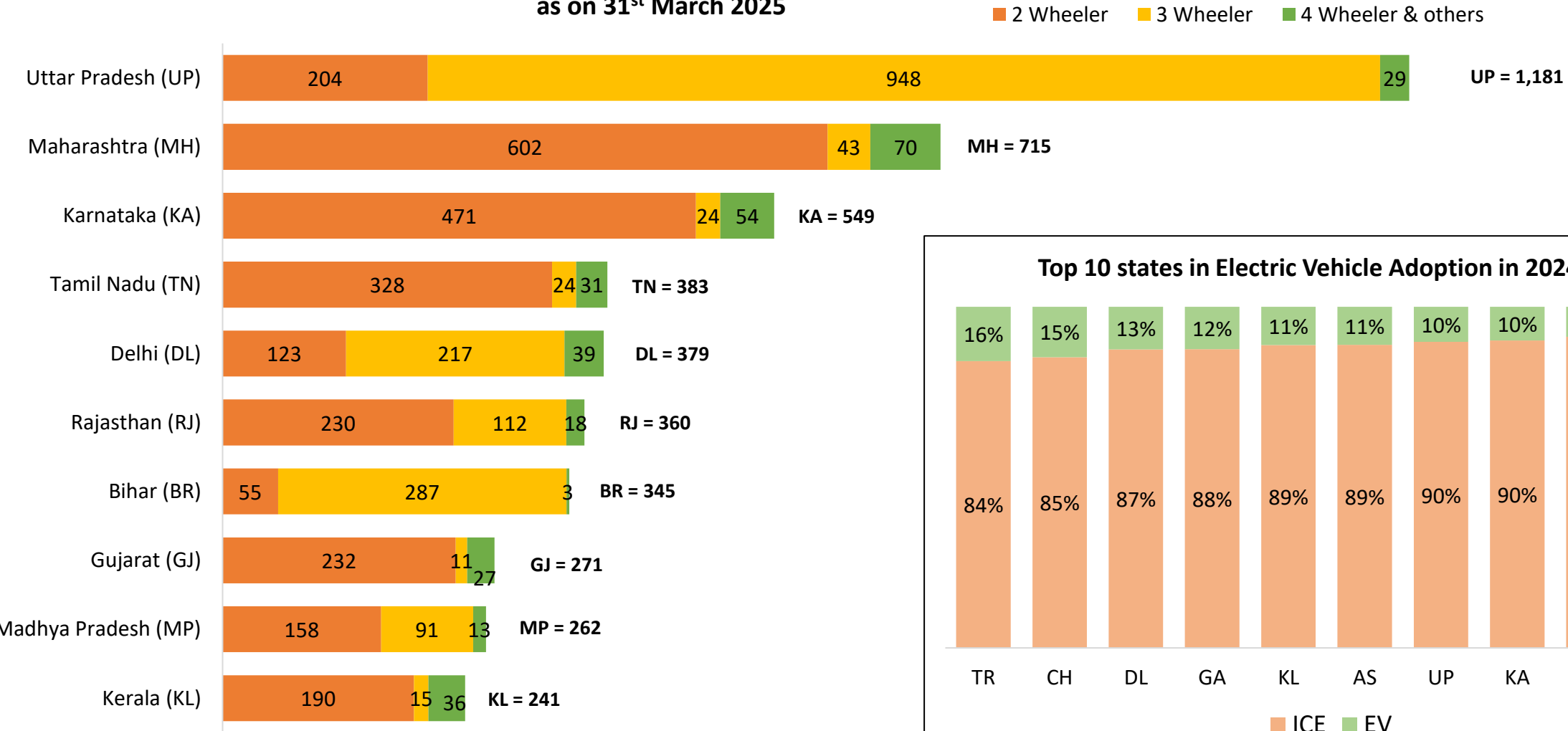
Gas Daily Market Price



MMBTU- Million Metric British Thermal Unit

Status of Electric Mobility in India

Top 10 States for Electric Vehicles (in Thousands)
as on 31st March 2025



Recent Interventions to promote Renewable Energy

Solar

Under the [PLI scheme](#), the GOI has announced INR 19,500 crores to incentivize the manufacturing of domestic solar PV modules.

[PM-Surya Ghar: Muft Bijli Yojana](#) released with a total outlay of Rs. 75,021 crore for installing rooftop solar (RTS) for one crore households. The scheme provides a CFA of Rs 30,000 for a 1 kW RTS system, Rs 60,000 for a 2kW RTS system, and Rs 78,000 for a 3kW RTS system.

The [inter-state transmission charges](#) are waived for 25 years for the projects being commissioned before 30th June 2025.

The [updated RPO](#) compliance supports solar integration of up to 33.57% of the electricity purchased by DISCOMs/states till the year 2029-30.

[PM KUSUM scheme](#) has been extended till Mar'26 to install pump sets up to 15 HP in selected areas.

Wind

[Reverse auctions have been scrapped](#) for wind projects. A traditional two-part (technical and financial) bid system has been put in place.

To support [off-shore wind](#), SECI will invite bids for up to 4GW to set up offshore wind plants off the coast of Tamil Nadu and Gujarat.

The ISTS charges are waived for 25 years for the [onshore projects](#) being commissioned before 30th June 2025 and for [off-shore projects](#) on or before 31st December 2032.

The [updated RPO](#) compliance supports WIND integration of up to 6.94% of the electricity purchased by DISCOMs/states till the year 2029-30.

The [National Repowering & Life Extension Policy for Wind Power Projects- 2023](#), for wind power projects is released for the optimum utilization of wind energy resources by maximizing energy (kWh) yield per sq. km of the wind project areas.

The GoI has decided to invite bids for 50 GW of RE annually, which includes up to [10 GW of wind](#) capacity.

Energy Storage

Ministry of Power has released the [guidelines for the development of PSP](#) with the target of 26.7 GW of PSP and 47.2 GW of BESS to integrate with RE capacity till 2032.

[PLI scheme](#) unveiled for setting up 50 GWh ACC battery storage with an outlay of ₹18,100 crores.

Under the [Waste Management Rules 2022](#), the disposal of waste batteries in landfills and incineration is prohibited and the recycling of waste batteries is made mandatory.

[CERC](#), under RRAS regulation, has allowed the use of energy storage in secondary and tertiary ancillary support.

The [Energy Storage Obligation](#) of DISCOMs is pegged at 4.0% up to 2029-30.

India's [first 20 MW/40MWh BESS project](#) is going to go live at the 33/11 kV Kilokari sub-station belonging to BRPL, Delhi.

Under the aegis of MNRE, SECI has successfully commissioned [India's largest BESS plant, featuring a 40 MW/120 MWh](#) BESS alongside a solar PV plant with a installed capacity of 152 MWh, located in Rajnandgaon, Chhattisgarh.

Green Hydrogen (H₂)

[National Green Hydrogen Mission](#) (NGHM) aims to meet the target of 5 million metric tonnes of green hydrogen production by 2030. The initial outlay for the Mission will be INR 19,744 crores. [NGHM portal](#) to track the recent initiatives and developments.

India's [first Green Hydrogen Hub to be build in Andhra Pradesh](#) by NTPC at an estimated cost of ₹1.85 Lakh Crore with a capacity of producing 1500 TPD Green Hydrogen and 7500 TPD Green Hydrogen derivative

MNRE has sanctioned [pilot projects on Hydrogen Fuelled Buses and Trucks](#) consisting total of 37 vehicles and 9 hydrogen refueling stations.

MNRE has sanctioned [3 pilot projects in steel sector](#) for use of green Hydrogen in steel production to be commissioned in next 3 years with total financial outlay of ₹347 Crore from GoI.

Indian Railways to run [35 Hydrogen trains under "Hydrogen for Heritage"](#) at an estimated cost of ₹ 80 crores per train and ground infrastructure of ₹ 70 crores per route on various heritage/hill routes.

Key Highlights or Announcements of March 2025

- The Government of Madhya Pradesh has introduced the [“Madhya Pradesh Renewable Energy Policy- 2025”](#), which will remain in effect for the next five years or until a new policy is adopted. Key objectives of the policy include:
 - Achieving 50% of the state’s energy mix from renewable sources by 2030
 - Developing 10 GW of renewable energy and hybrid parks under GoI and GoMP schemes by 2027
 - Establishing an additional 10 GW of renewable energy projects dedicated to power export outside the state by 2027
 - Creating 50,000 new jobs in the renewable energy sector by 2030
- The Government of Madhya Pradesh has launched the [Madhya Pradesh Electric Vehicle Policy 2025](#), with a vision to establish Bhopal, Indore, Jabalpur, Gwalior, and Ujjain as model EV cities. The policy sets ambitious targets including:
 - 40% of new two-wheeler registrations to be electric
 - 100% electrification of the commercial vehicle fleet
 - 70% of new three-wheeler registrations (both passenger and freight) to be electric
 - 15% of new four-wheeler registrations to be electric
 - 40% of new bus registrations to be electric.Additionally, the policy mandates the complete conversion of all state government vehicles to electric vehicles.

Key Highlights or Announcements of March 2025

- Tamil Nadu has set an ambitious target to generate an additional 100 billion units of renewable energy, reinforcing its commitment to climate action. The state has [allocated ₹21,178 crore in the budget to support renewable energy initiatives](#). To achieve this goal, the government plans to develop pumped storage projects with a total capacity of 2.9 GW. Further, the state will also set up a 4 GWh battery energy storage system in 2025–26 to enhance grid reliability and energy security.
- India has made a remarkable progress by awarding [4,12,000 TPA of Green Hydrogen production and approving 3 GW of electrolyser manufacturing capacity per annum](#). Additionally, seven pilot projects have been launched across transportation, shipping, steel, and storage, alongside the publication of 88 standards to ensure safety and scalability.



VASUDHA
FOUNDATION
Green ways for a good earth!

Vasudha Foundation

CISRS House, 14 Jangpura B, Mathura Road,
New Delhi - 110014, India
Tel/fax: + 91-11-2437-3680



Visit us at <http://www.vasudha-foundation.org/>

For more information about Vasudha Foundation, email us at
info@vasudhaindia.org