India’s Energy Overview

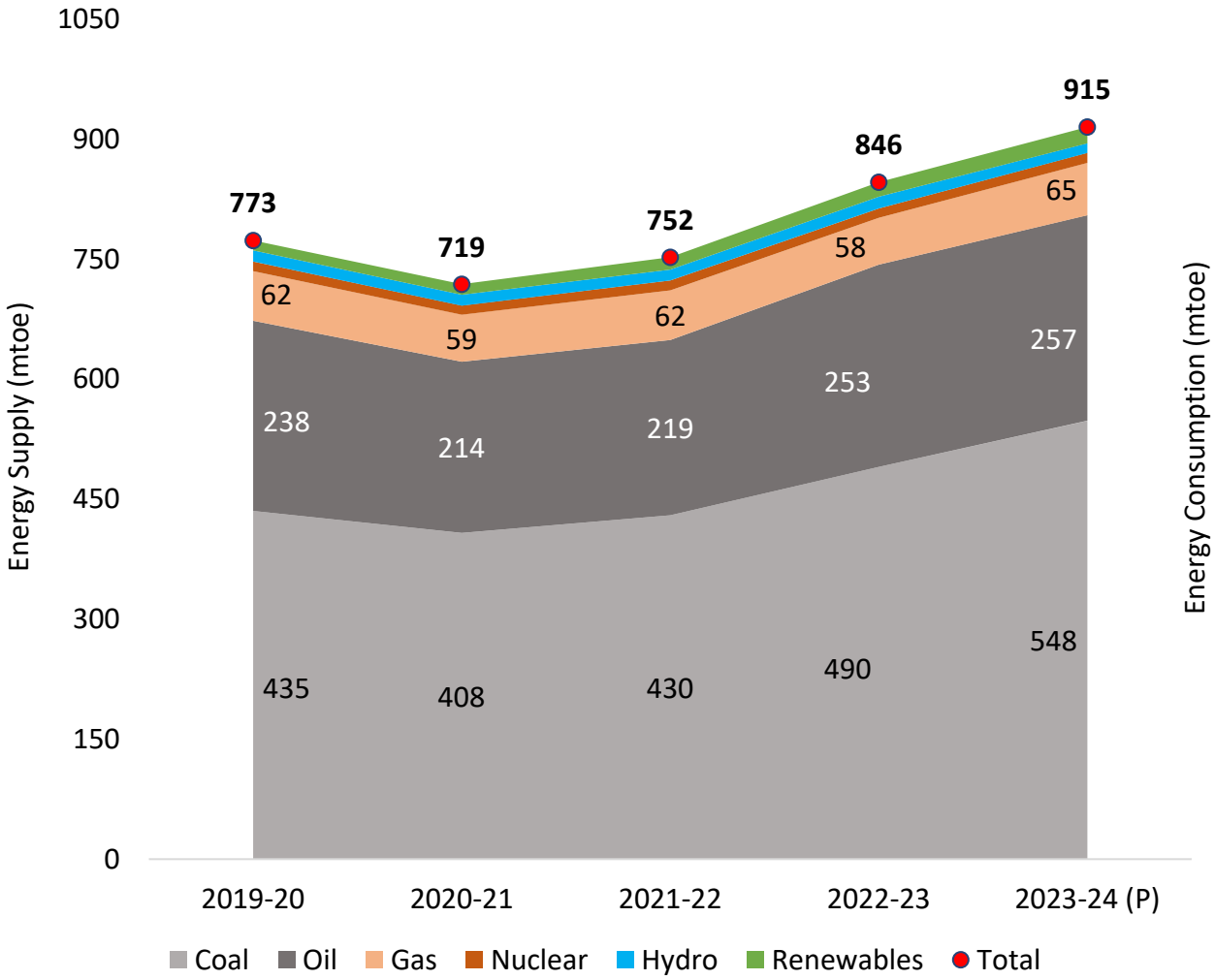
April 2025

VASUDHA FOUNDATION
Green ways for a good earth!

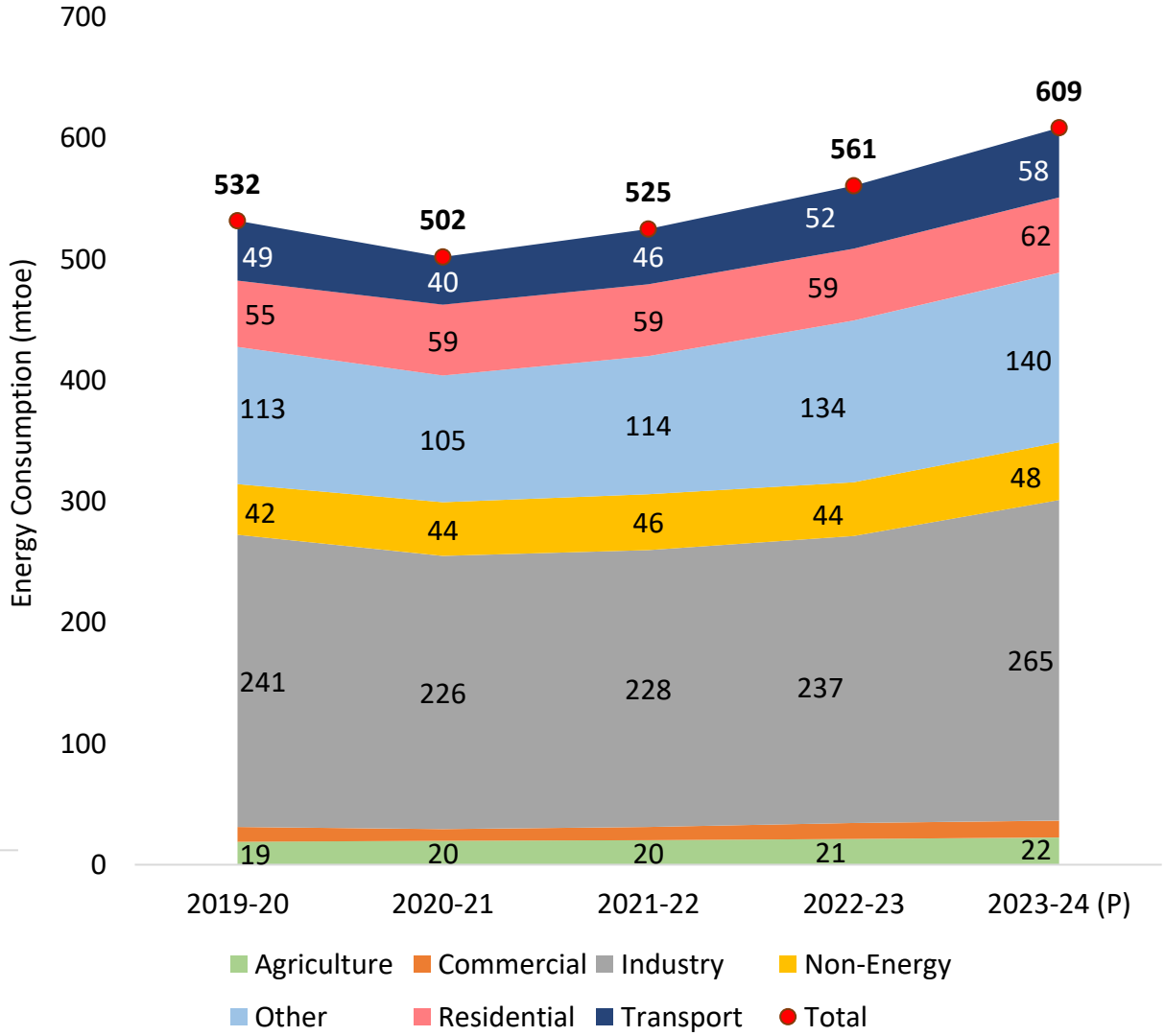
Contents

Primary* and Final Energy Mix in India

Source-wise Primary Energy Supply (mtoe)*

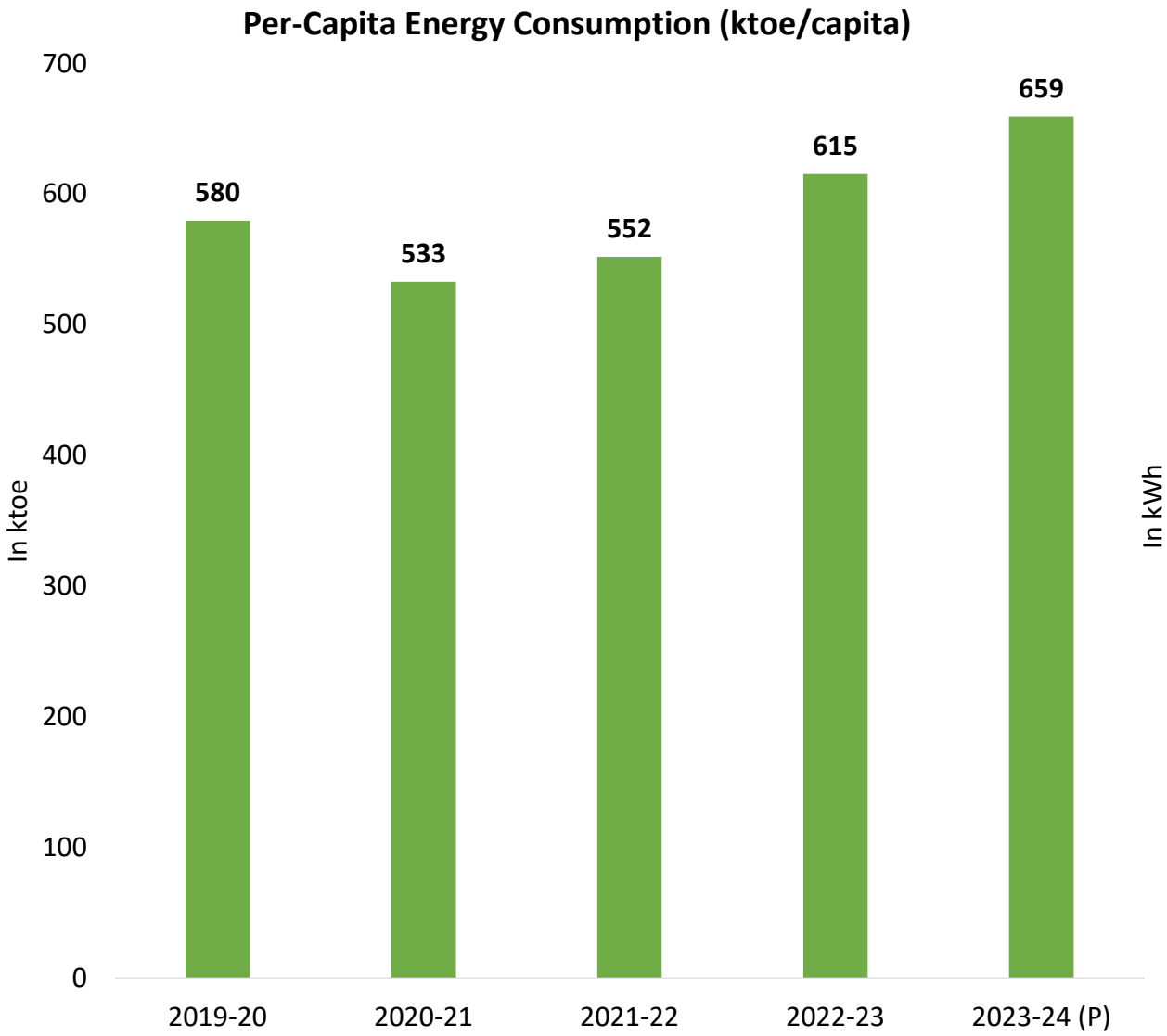


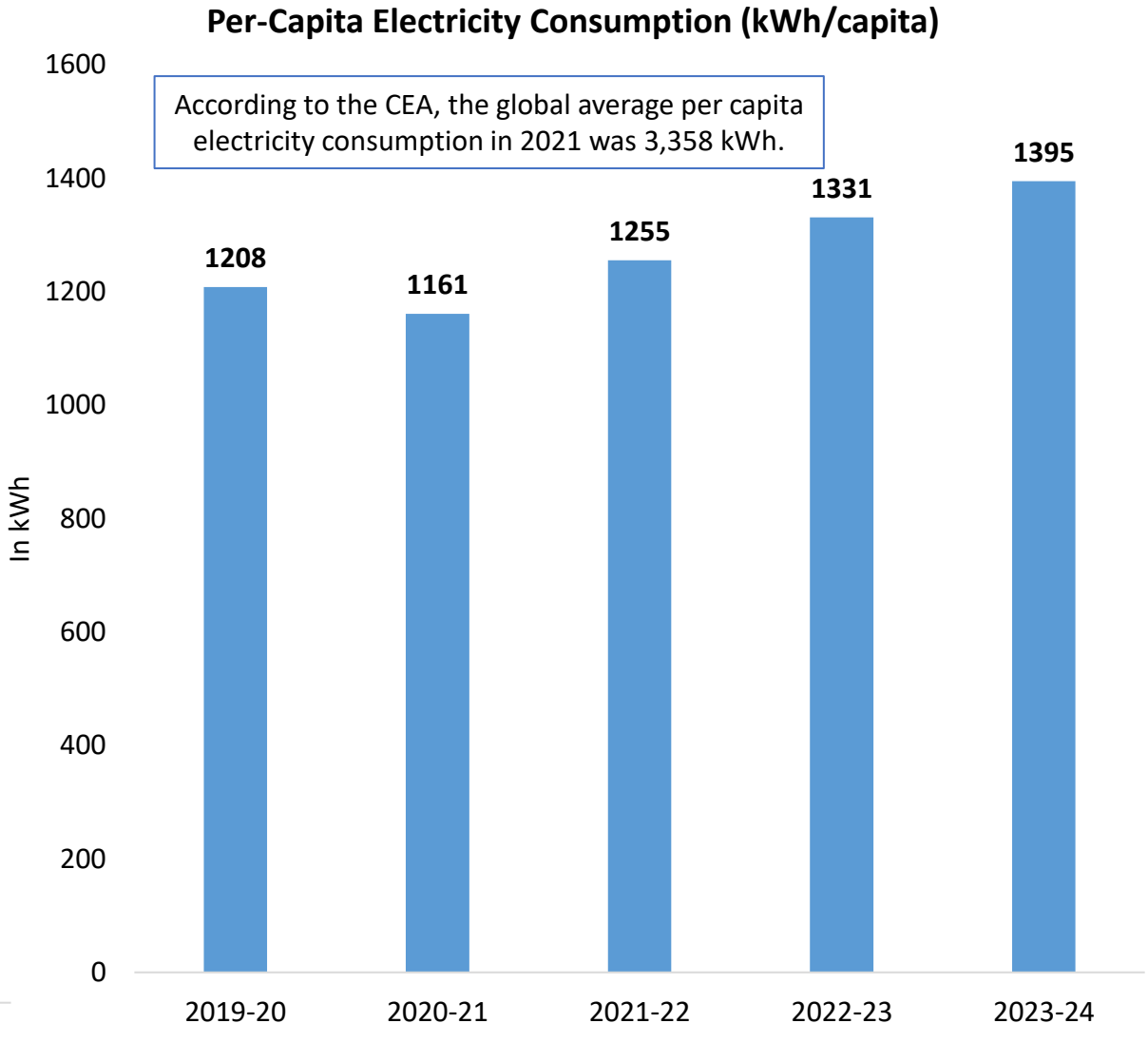
Sector-wise Energy Consumption (mtoe)



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

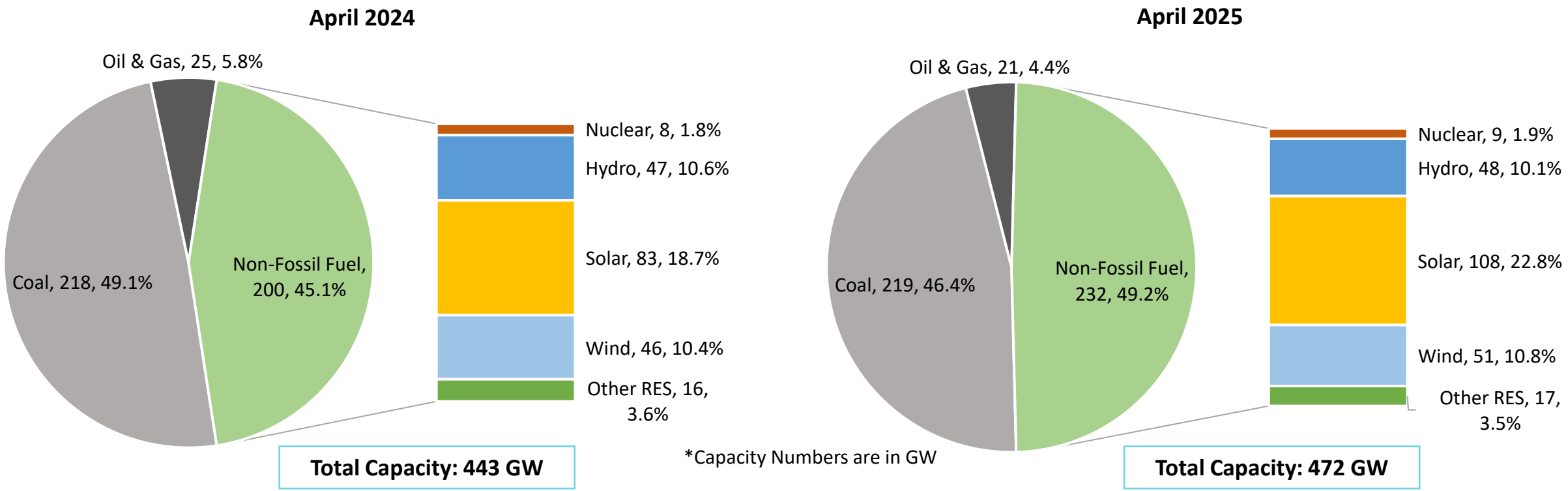
Per-Capita Energy and Electricity Consumption





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

India’s Electricity Capacity Mix (Utility-scale)

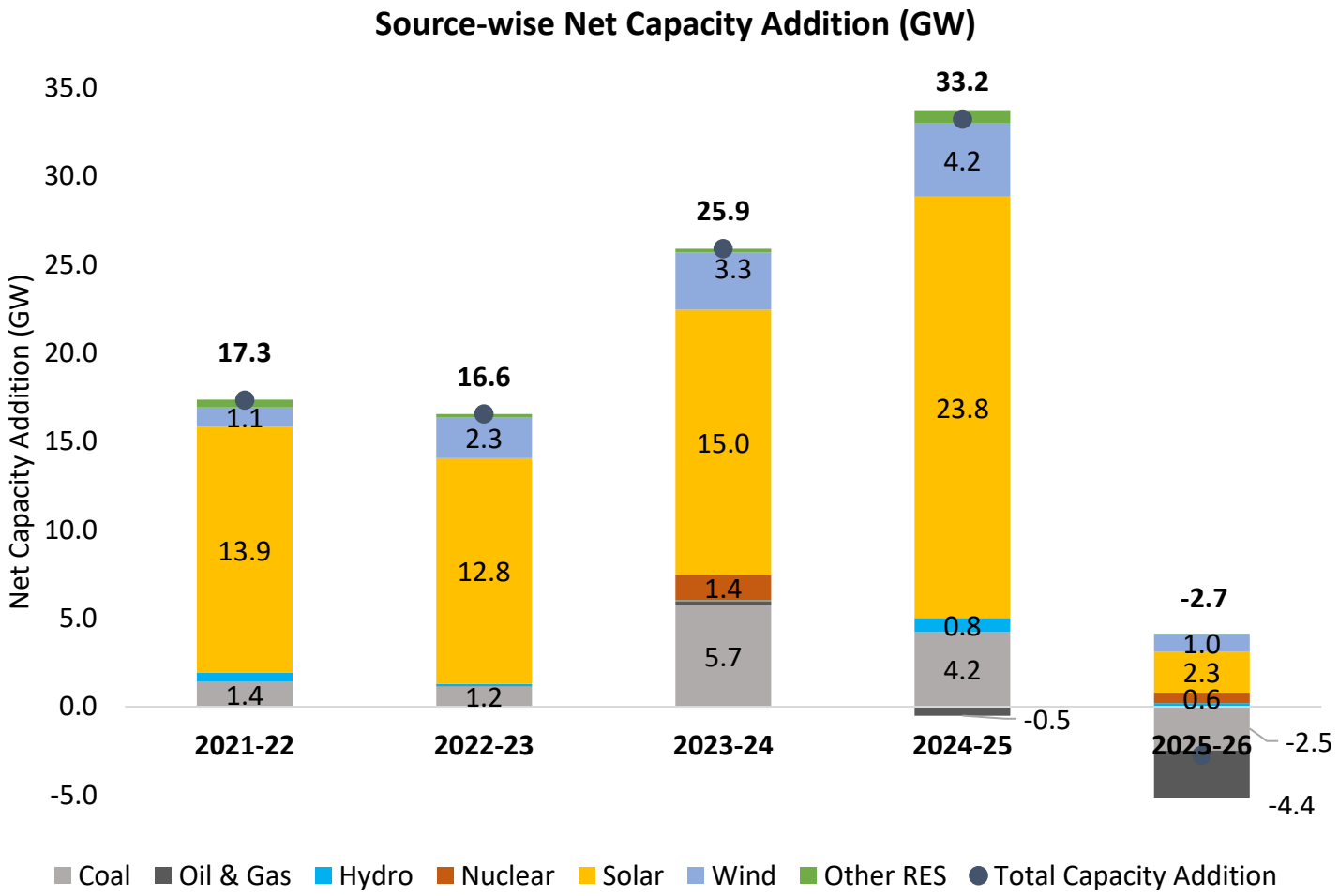


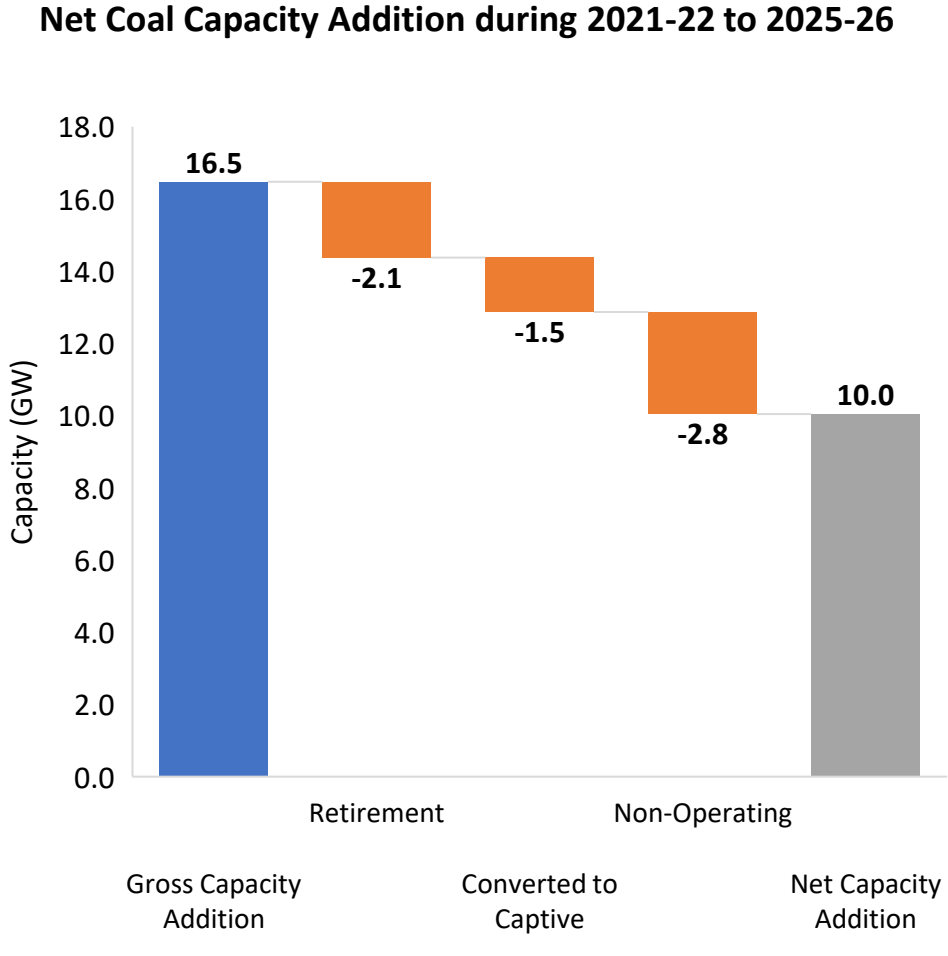
*Capacity Numbers are in GW

- India’s electricity generating capacity is 472 GW as on Apr’2025 [coal 219 GW (46%), solar 108 GW (23%), wind 51 GW (11%), and hydro 48 (10%)].
- As on Apr’2025, the share of non-fossil-based electricity capacity is 49% against the set target of 50% non-fossil capacity by 2030.
- As on Apr’2025, India’s renewable energy capacity (including large hydro) stood at 224 GW out of 472 GW.

Source: CEA

India’s Electricity Capacity Addition in last 5 years





- A total of 83 GW of generation capacity has been added in RE (Hydro, solar, wind, and other RES) over the past 5 years (2021-22 to 2025-26*), whereas the net coal capacity addition during the same period was 10 GW, mostly in the central sector.

NOTE: * The data for 2025-26 is up to April 2025.

Source: CEA & MNRE

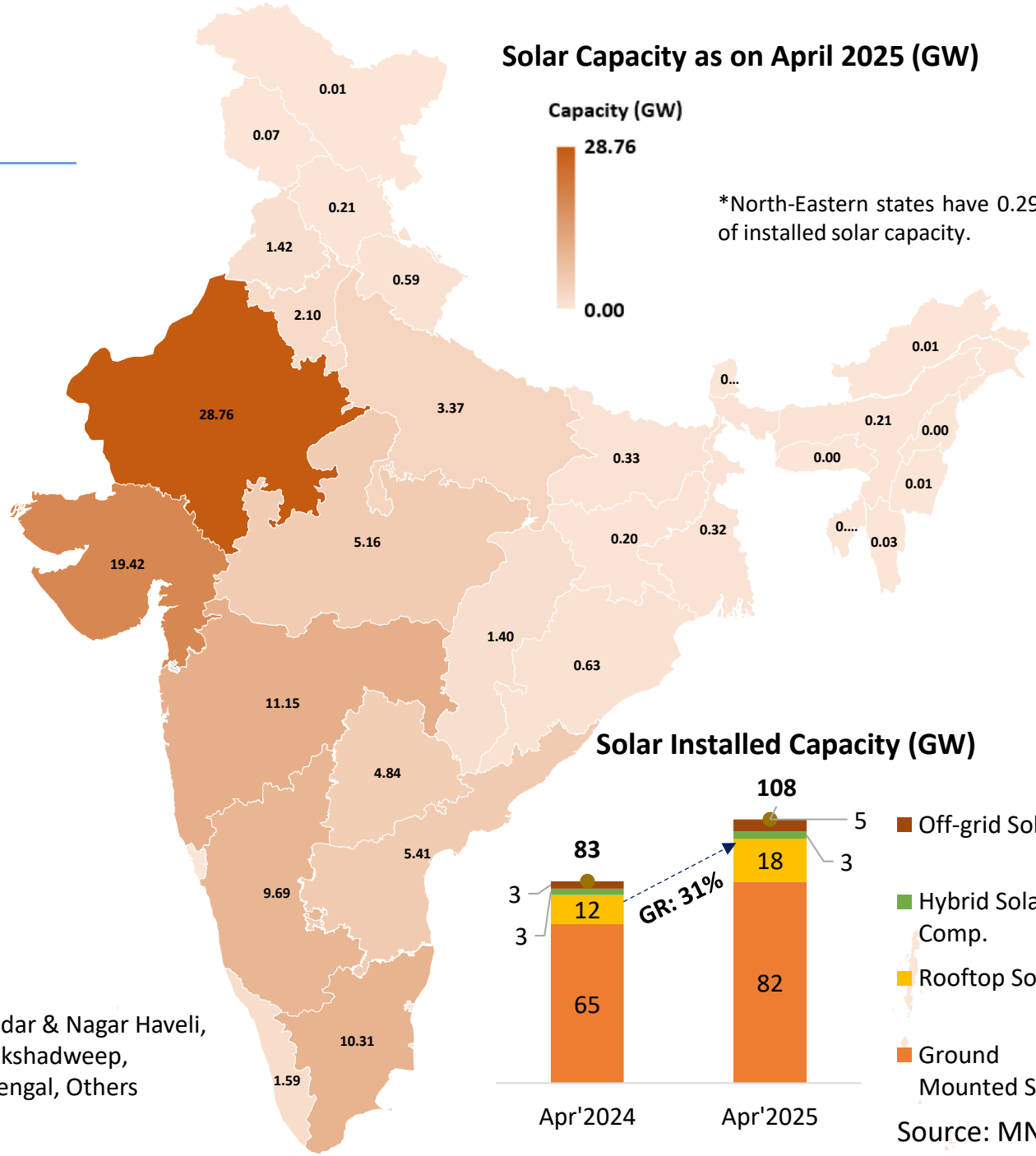
State-wise Solar Capacity

as on April 2025

State-wise installed capacity of Solar Power (GW)					
States	**Ground Mounted**	**Rooftop**	**Solar Component in Hybrid**	**Off Grid**	**Total Solar Power**
Rajasthan	**24.41**	1.56	**1.98**	0.81	**28.76**
Gujarat	13.11	**5.32**	0.83	0.17	19.42
Maharashtra	6.14	3.46	0.00	**1.55**	11.15
Tamil Nadu	9.24	1.00	0.00	0.07	10.31
Karnataka	8.87	0.70	0.08	0.04	9.69
Andhra Pradesh	5.00	0.32	0.00	0.09	5.41
Madhya Pradesh	4.52	0.54	0.00	0.10	5.16
Telangana	4.36	0.47	0.00	0.01	4.84
Uttar Pradesh	2.72	0.33	0.00	0.32	3.37
Haryana	0.27	0.86	0.00	0.98	2.10
Kerala	0.32	1.24	0.00	0.02	1.59
Punjab	0.89	0.45	0.00	0.08	1.42
Chhattisgarh	0.90	0.11	0.00	0.39	1.40
Odisha	0.51	0.08	0.00	0.04	0.63
Others	1.14	1.26	0.00	0.31	2.70
All India	**82.39**	**17.69**	**2.89**	**4.98**	**107.95**

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

Solar Capacity as on April 2025 (GW)



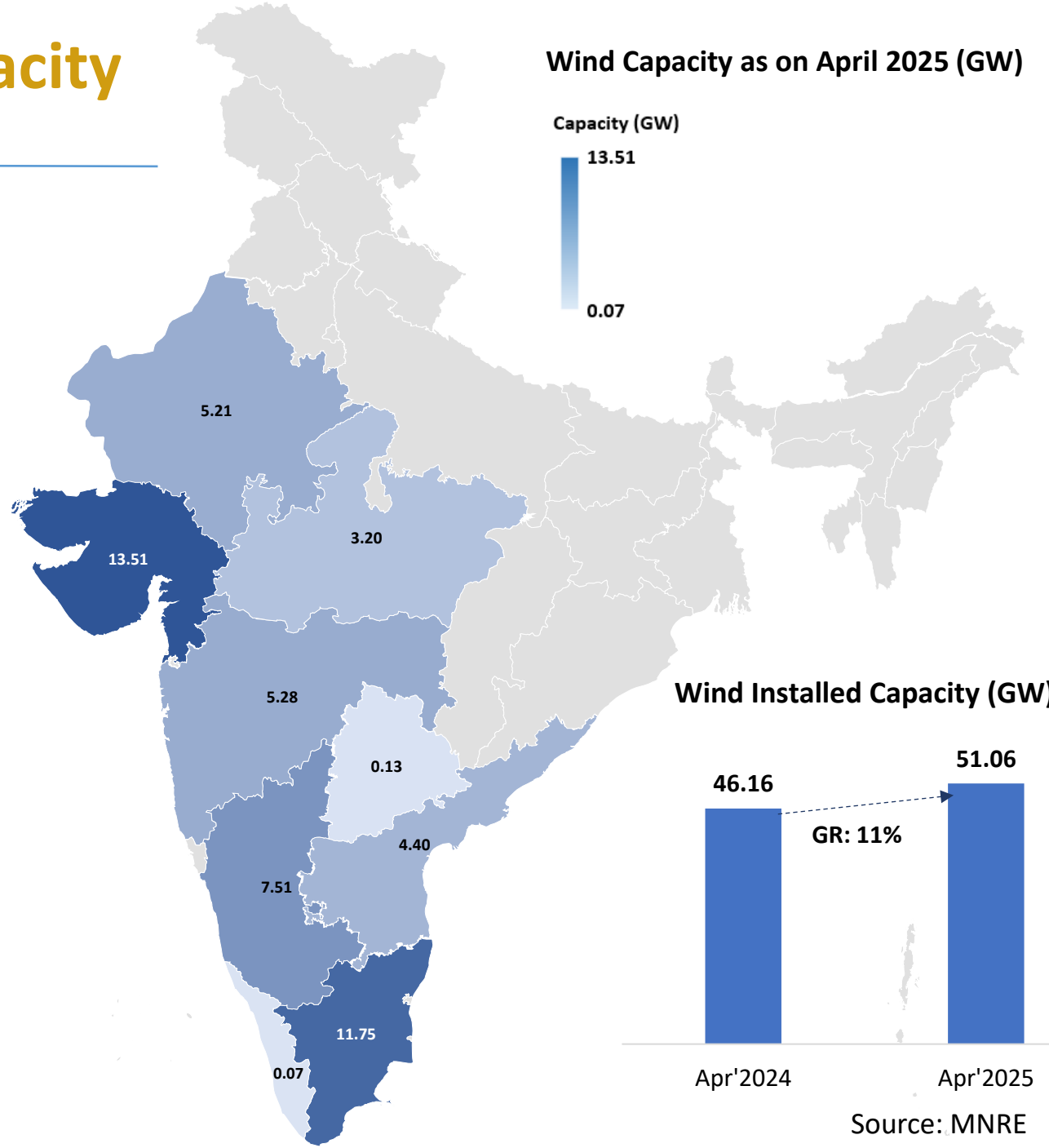
Solar Installed Capacity (GW)

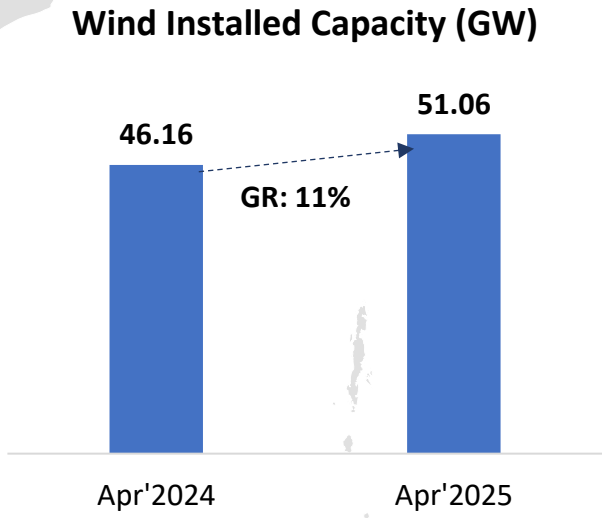
Source: MNRE

State-wise Wind Onshore Capacity

as on April 2025

State-wise installed capacity of Wind (Onshore) Power	
States	**Installed Capacity (GW)**
Gujarat	13.51
Tamil Nadu	11.75
Karnataka	7.51
Maharashtra	5.28
Rajasthan	5.21
Andhra Pradesh	4.40
Madhya Pradesh	3.20
Telangana	0.13
Kerala	0.07
India Total	**51.06**

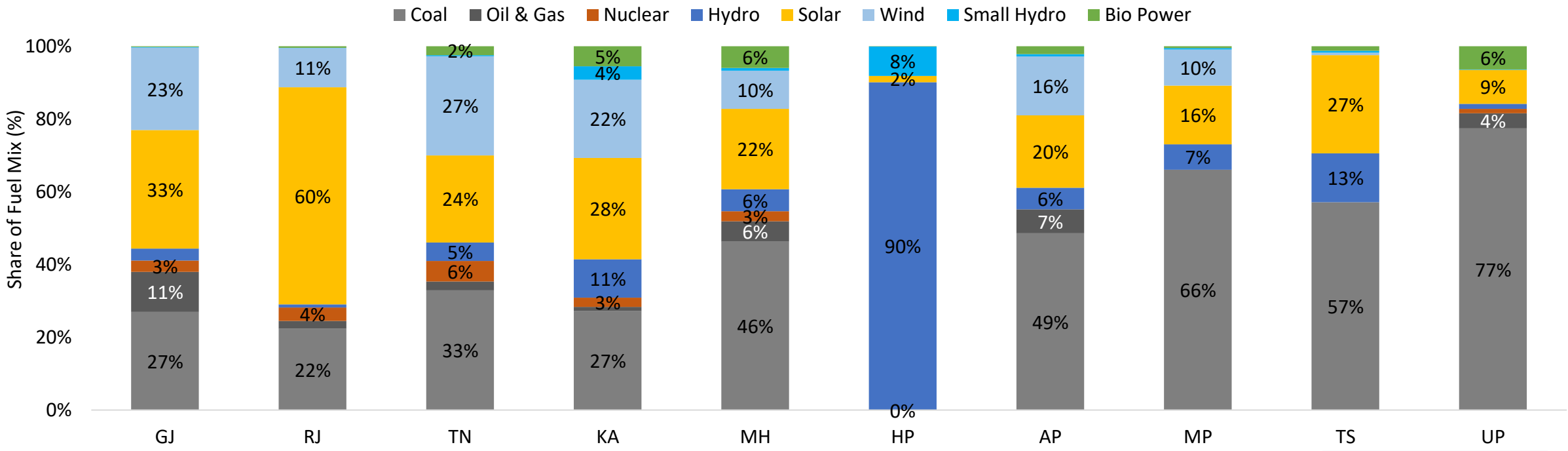




Source: MNRE

Top 10 High RE States and Their Capacity Mix

as on April 2025



Numbers are in GW

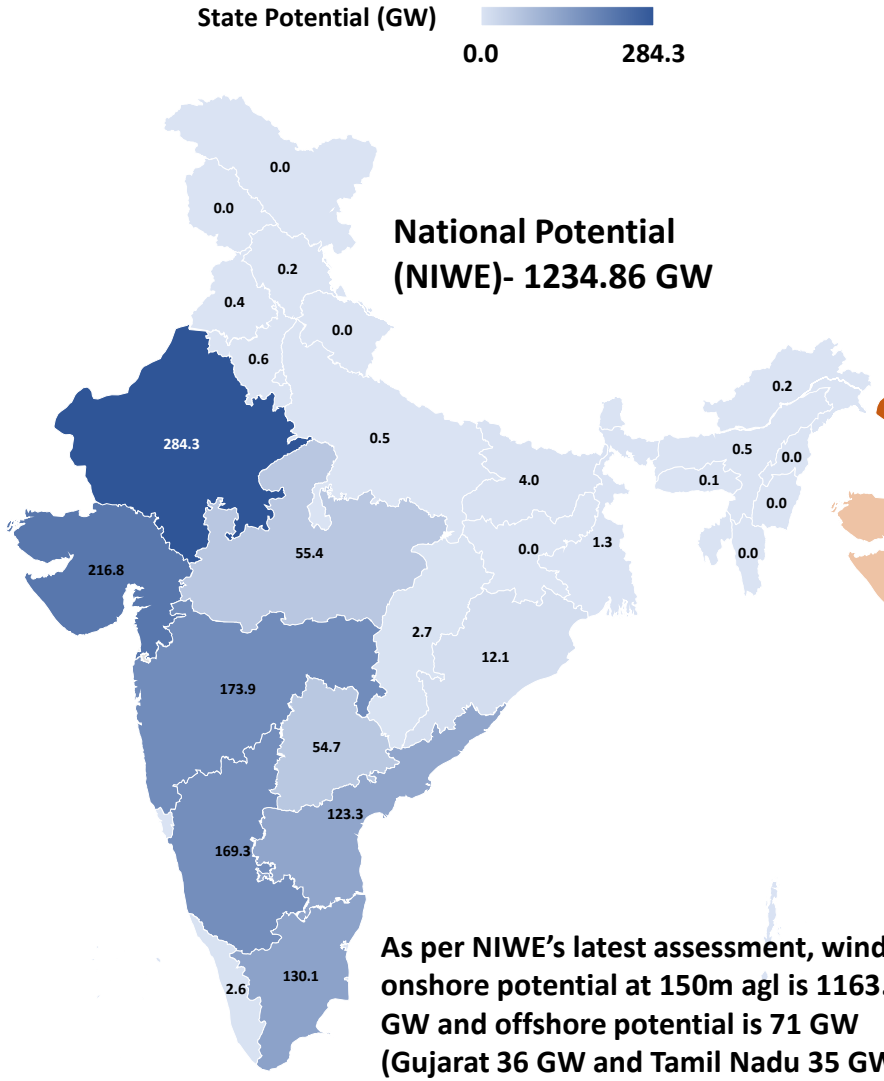
Parameters	GJ	RJ	TN	KA	MH	HP	AP	MP	TA	UP
Total Installed Capacity	59.68	48.19	43.06	34.84	50.40	12.41	27.14	32.04	17.93	36.20
Total RE Capacity	35.16	34.61	25.40	24.09	22.87	12.41	12.17	10.87	7.69	6.23
RE Share	59%	72%	59%	69%	45%	100%	45%	34%	43%	17%

Source: CEA & MNRE

RE Potential and Installed Capacity (1/2)

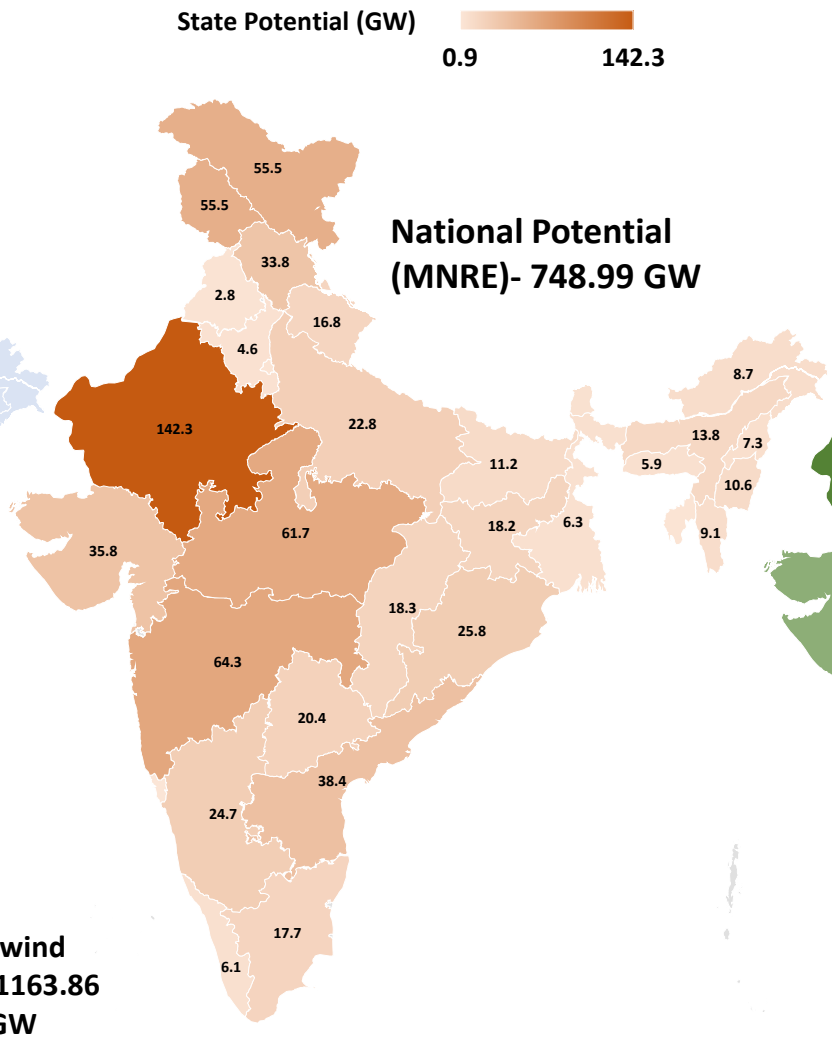
RE potential in the state

Wind Onshore (at 150m agl) and Offshore Potential



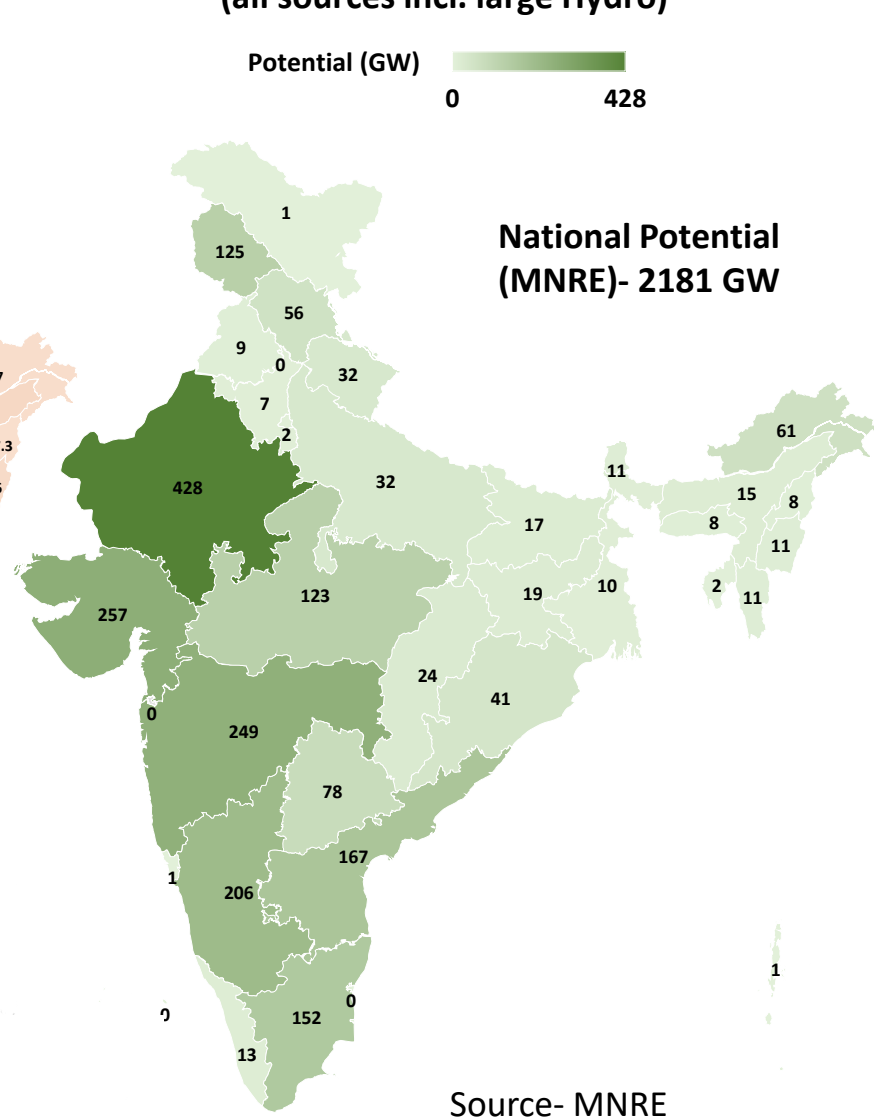
National Potential (NIWE)- 1234.86 GW

Solar Potential



National Potential (MNRE)- 748.99 GW

Renewable Energy Potential (all sources incl. large Hydro)



National Potential (MNRE)- 2181 GW

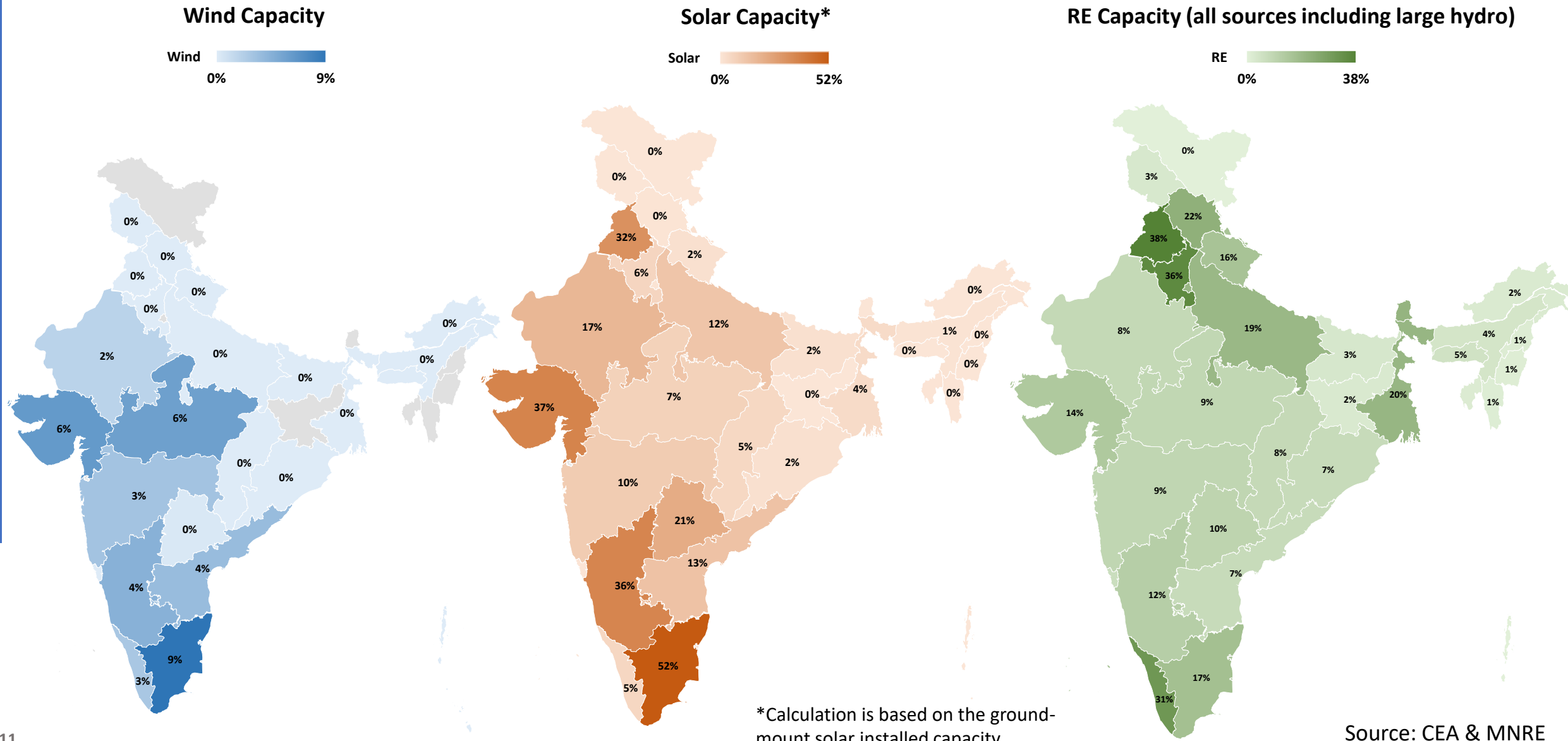
As per NIWE's latest assessment, wind onshore potential at 150m agl is 1163.86 GW and offshore potential is 71 GW (Gujarat 36 GW and Tamil Nadu 35 GW).

Market potential for SPV rooftop is 124 GW.

Source- MNRE

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

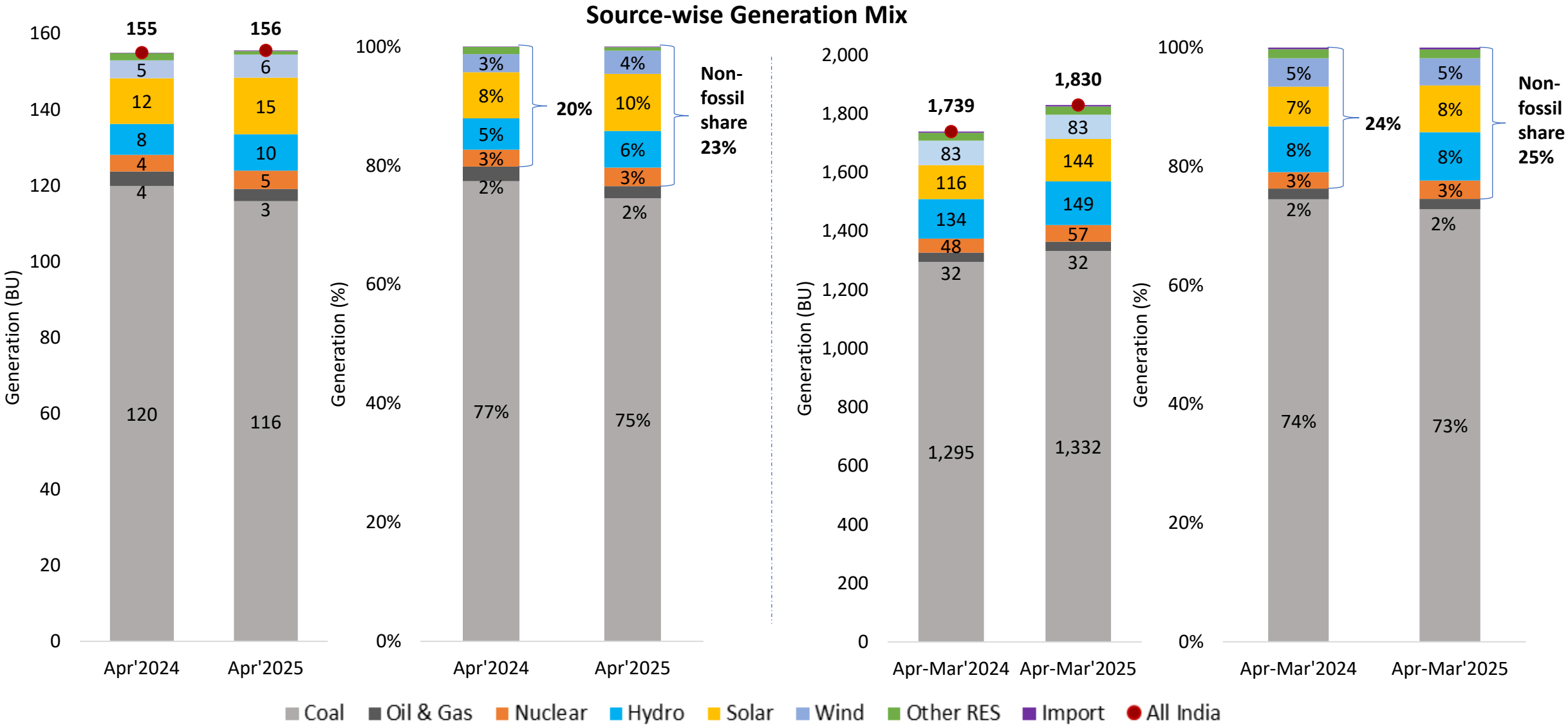
RE Installed capacity as a Percentage of the total resource potential in the state as on April 2025



*Calculation is based on the ground-mount solar installed capacity.

Source: CEA & MNRE

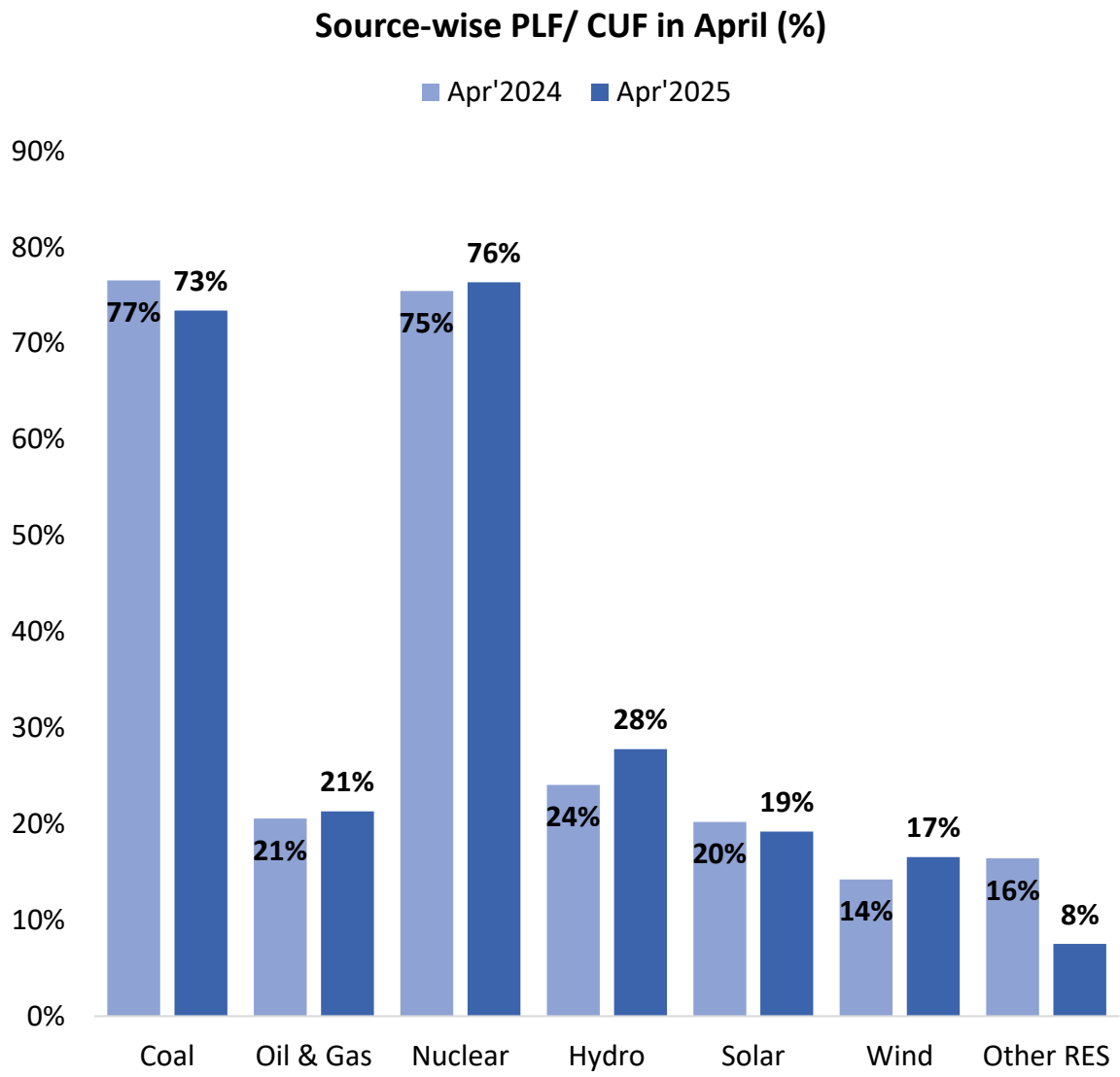
India’s Electricity Generation Mix

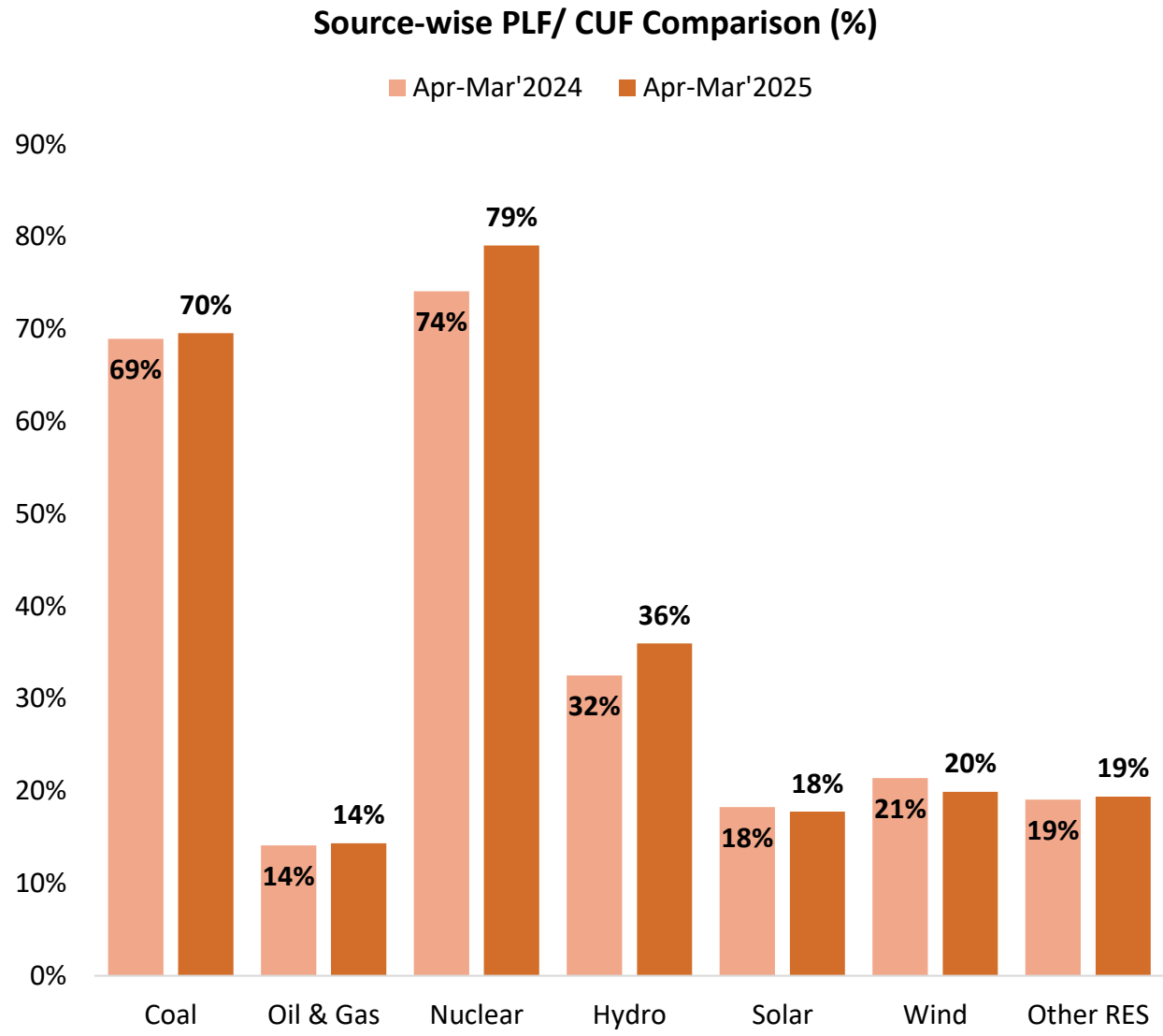


NOTE: The generation data for April’2025 is provisional.

Source: CEA

Source-wise PLF/CUF

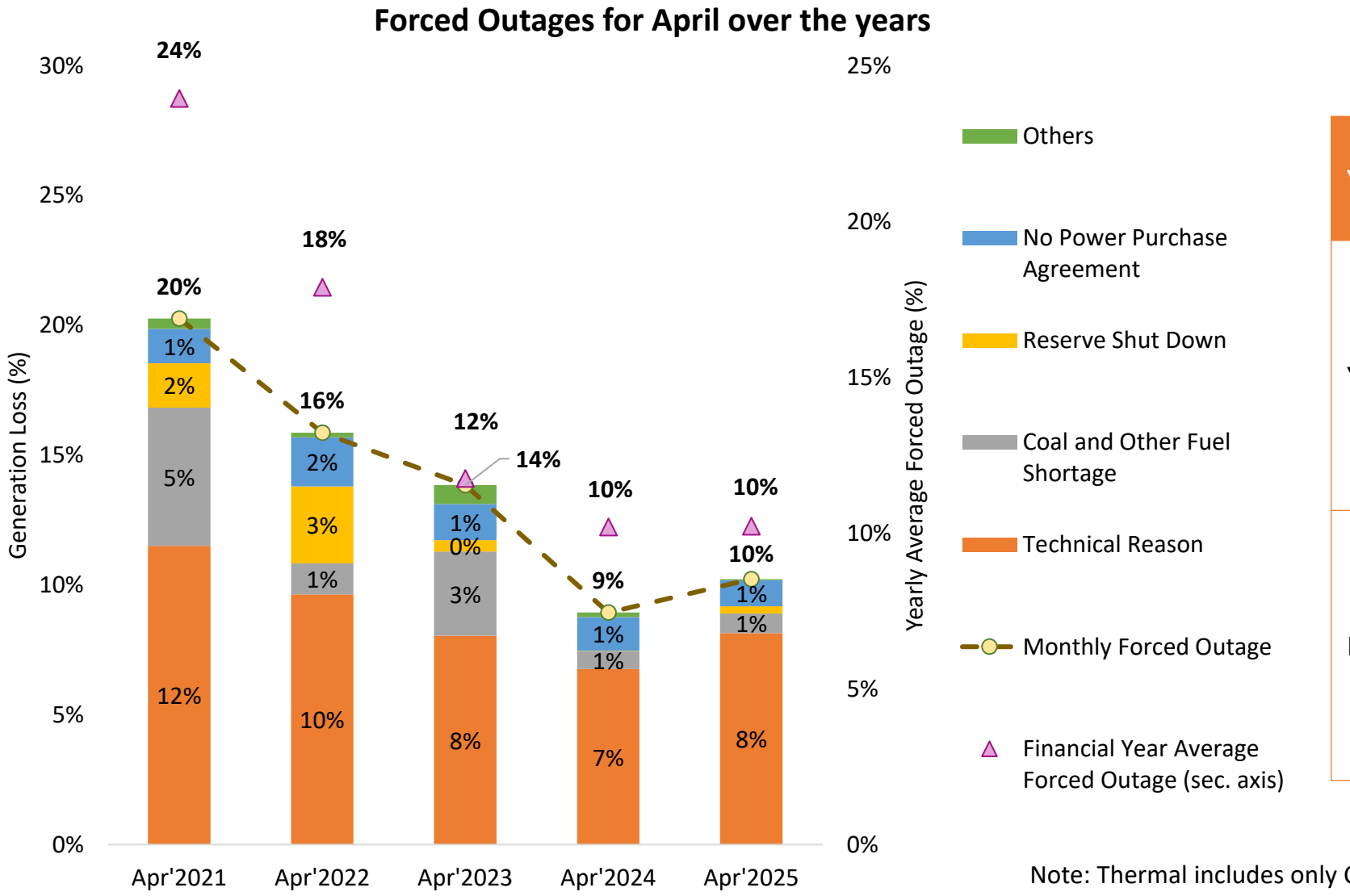




NOTE: The PLF/CUF data is based on provisional generation for April'2025.

Source: CEA & MNRE

Thermal Generation Loss and Reasons for Forced Outages

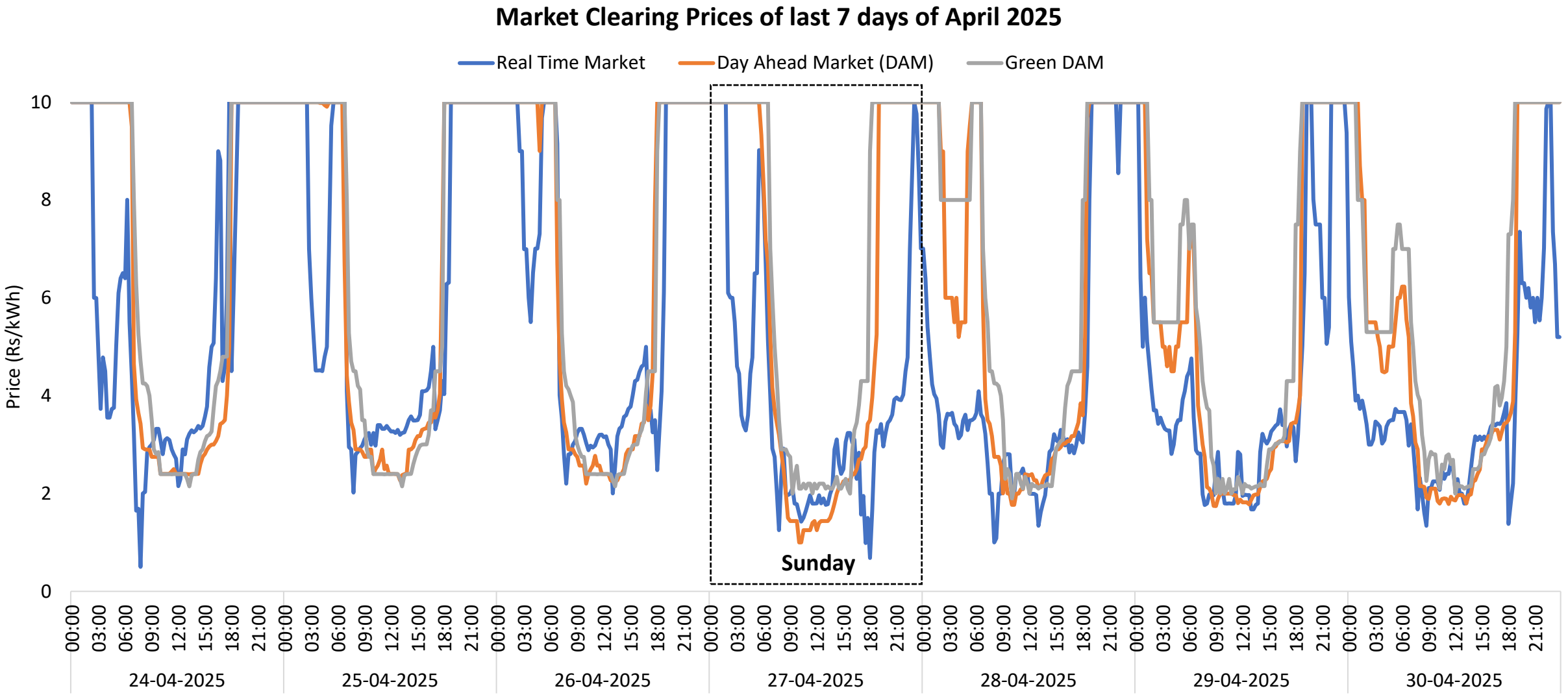


Year/ Month		Average Forced Outage Share
Yearly	FY 2022-23	12%
	FY 2023-24	10%
	FY 2024-25	10%
Monthly	Apr'2023	14%
	Apr'2024	9%
	Apr'2025	10%

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

Source: ICED

Indian Electricity Exchange (IEX) Market Snapshot

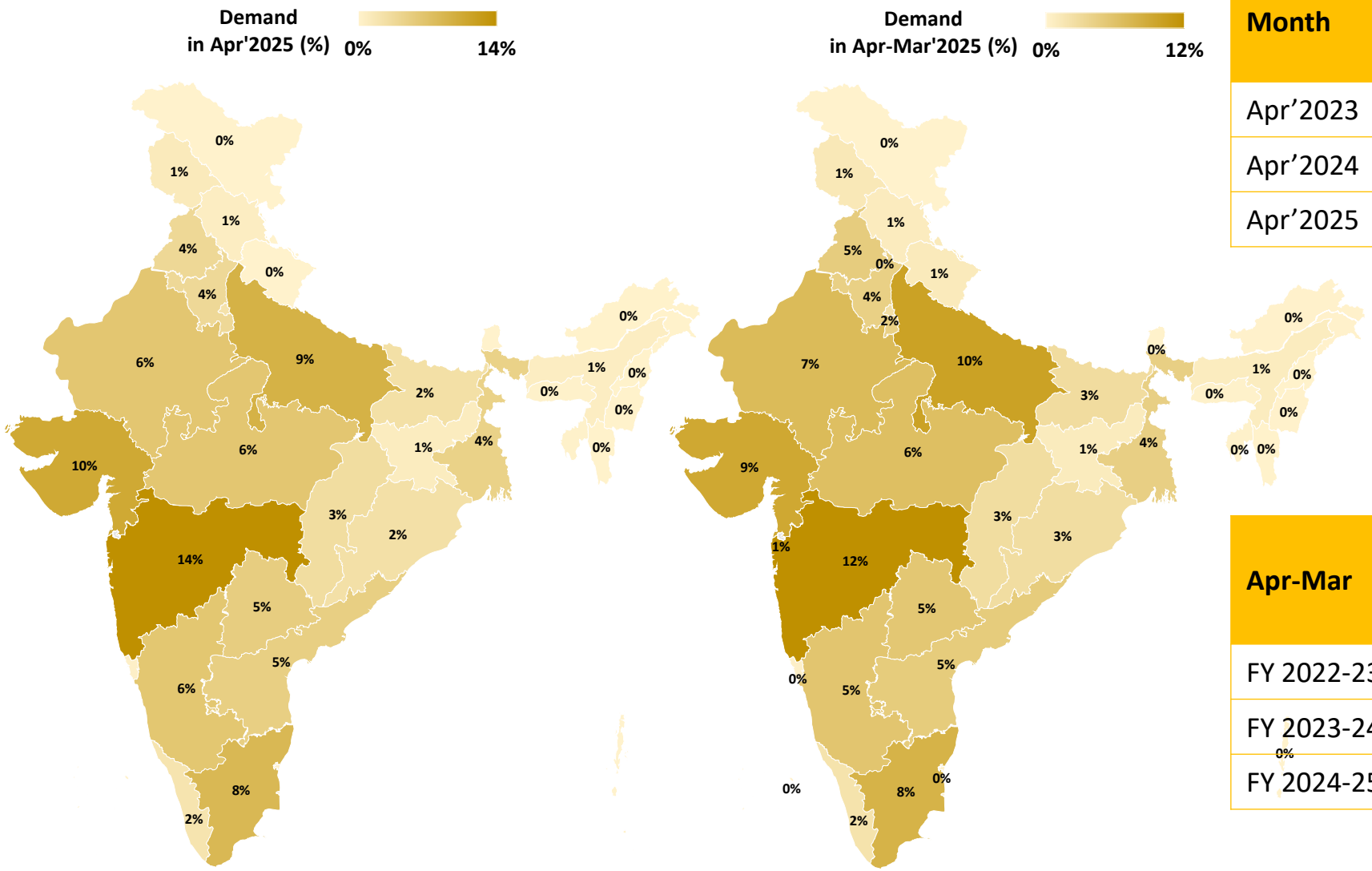


In April 2023, CERC revised the price ceiling from ₹12/kWh to ₹10/kWh in the power exchange market.

Source: IEX

National and State level Electricity Demand

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



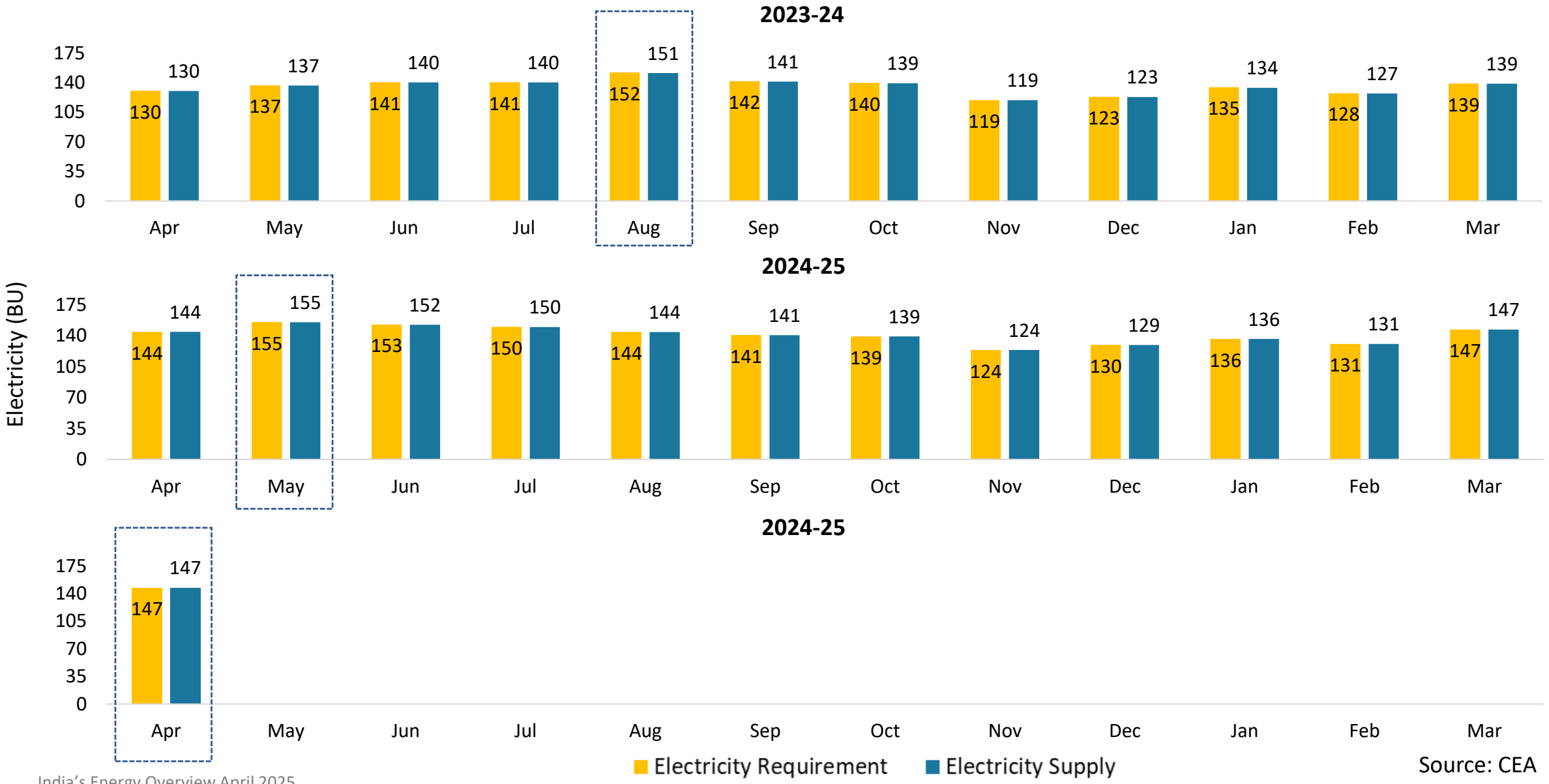
Month	Electricity Demand (BU)	Electricity Supply (BU)	Gap (BU) (+/-)
Apr'2023	130	130	0.3
Apr'2024	144	144	0.1
Apr'2025	147	147	0.1

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	1,694	1,692	1.6

NOTE: The demand represented above includes intra state T&D losses.

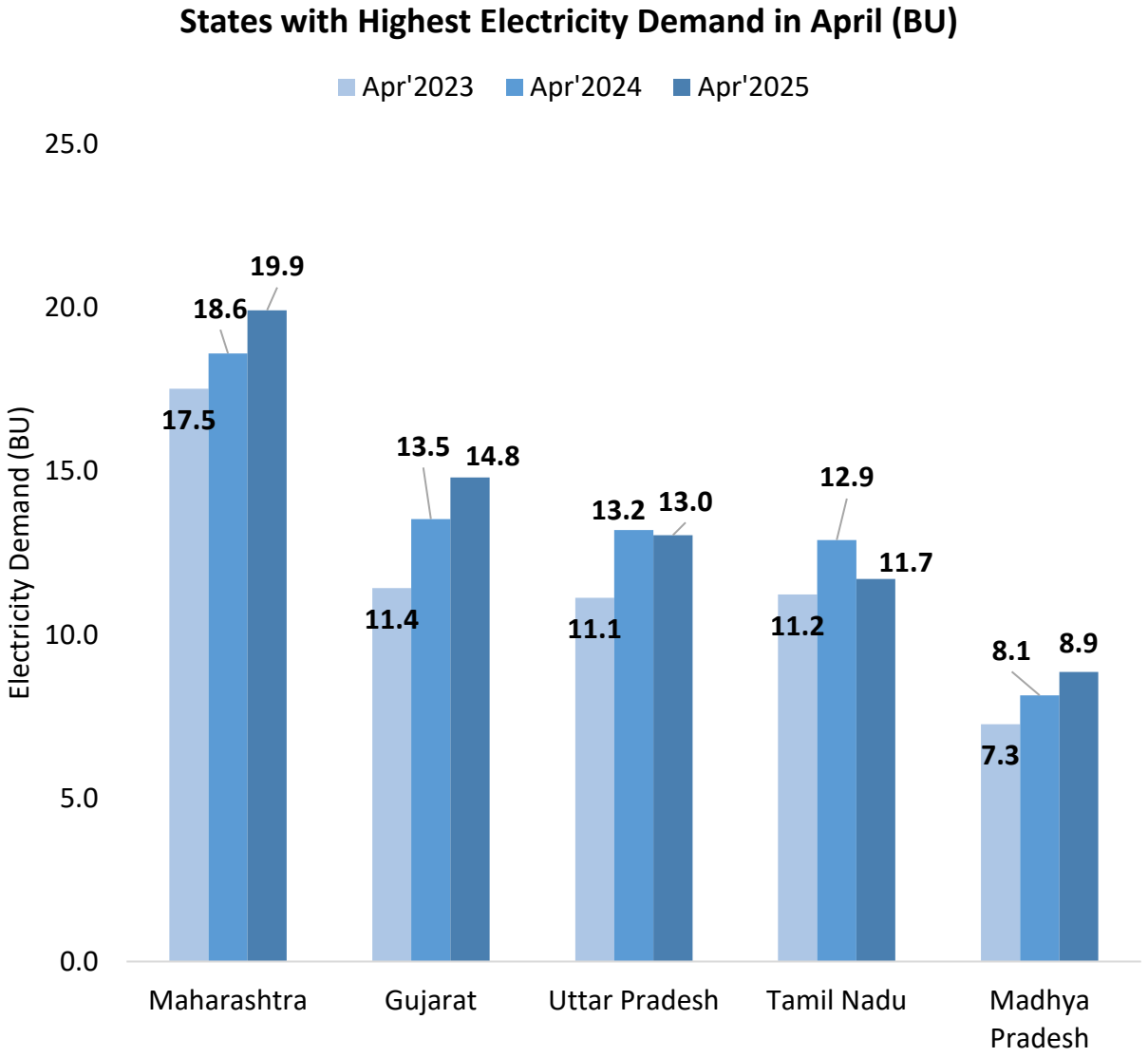
Source: CEA

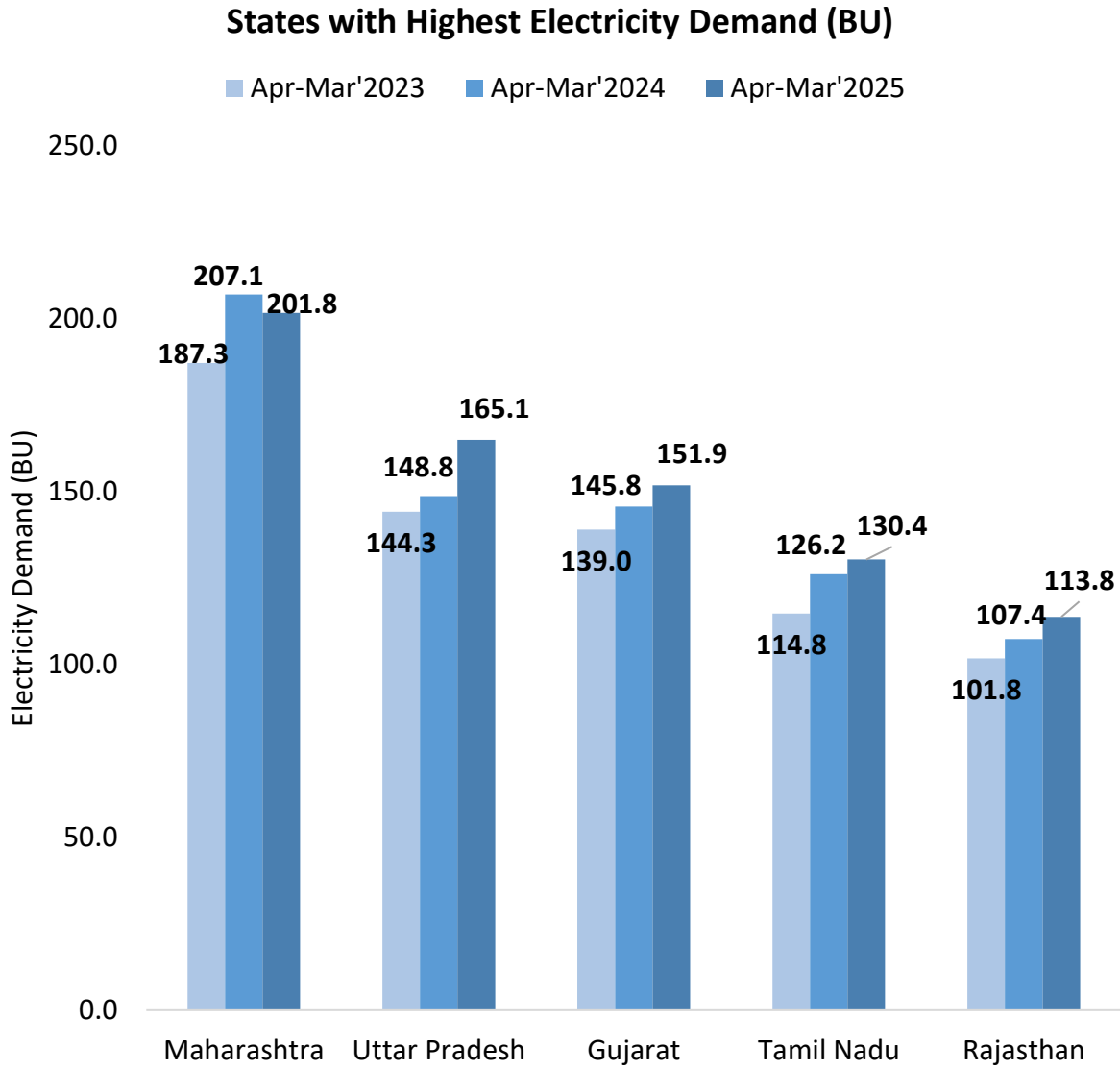
India’s Monthly Electricity Requirement and Supply



Source: CEA

Monthly Electricity Demand of the top 5 states

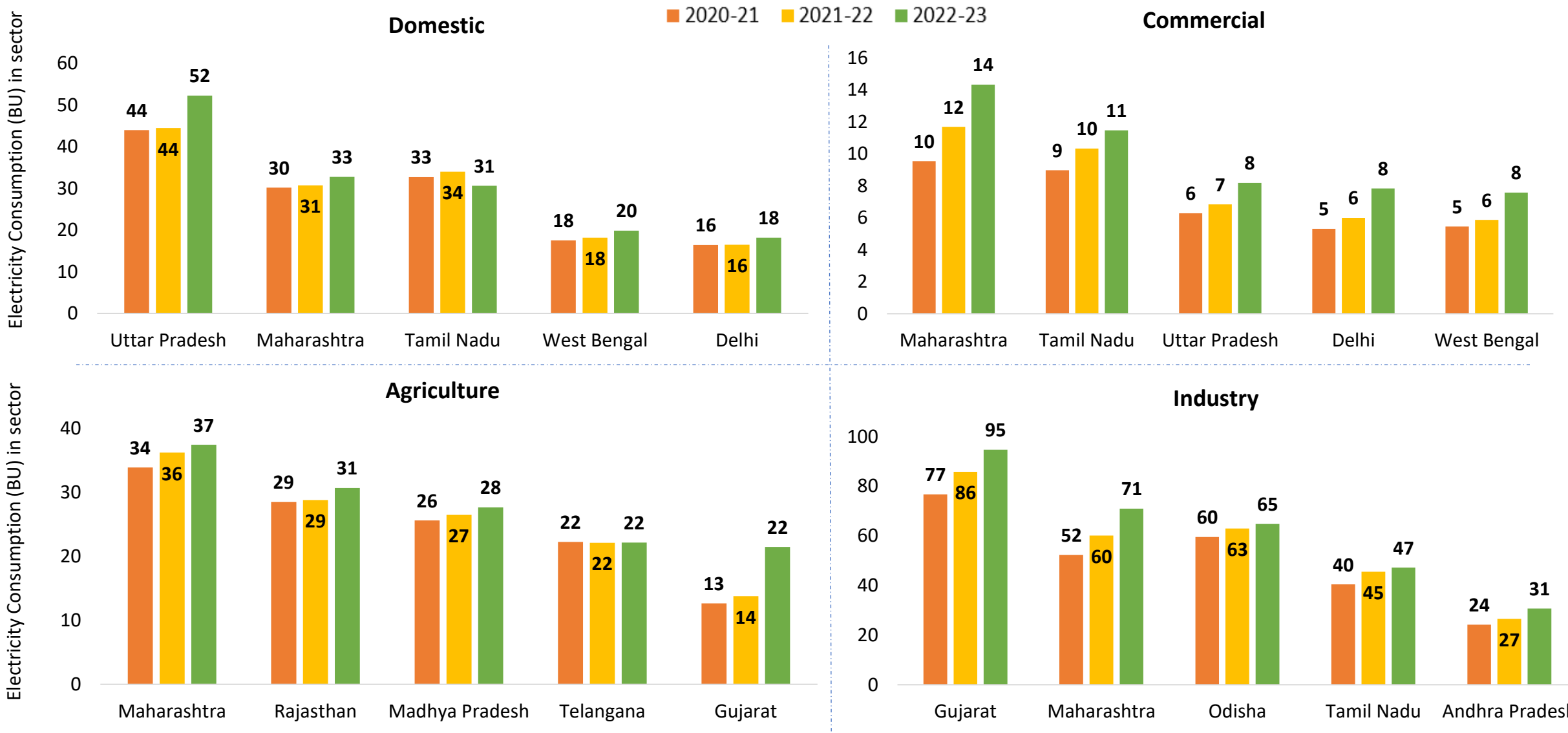




Note: The electricity demand data for April'25 is Provisional.

Source: CEA

Electricity Consumer-category wise top 5 States

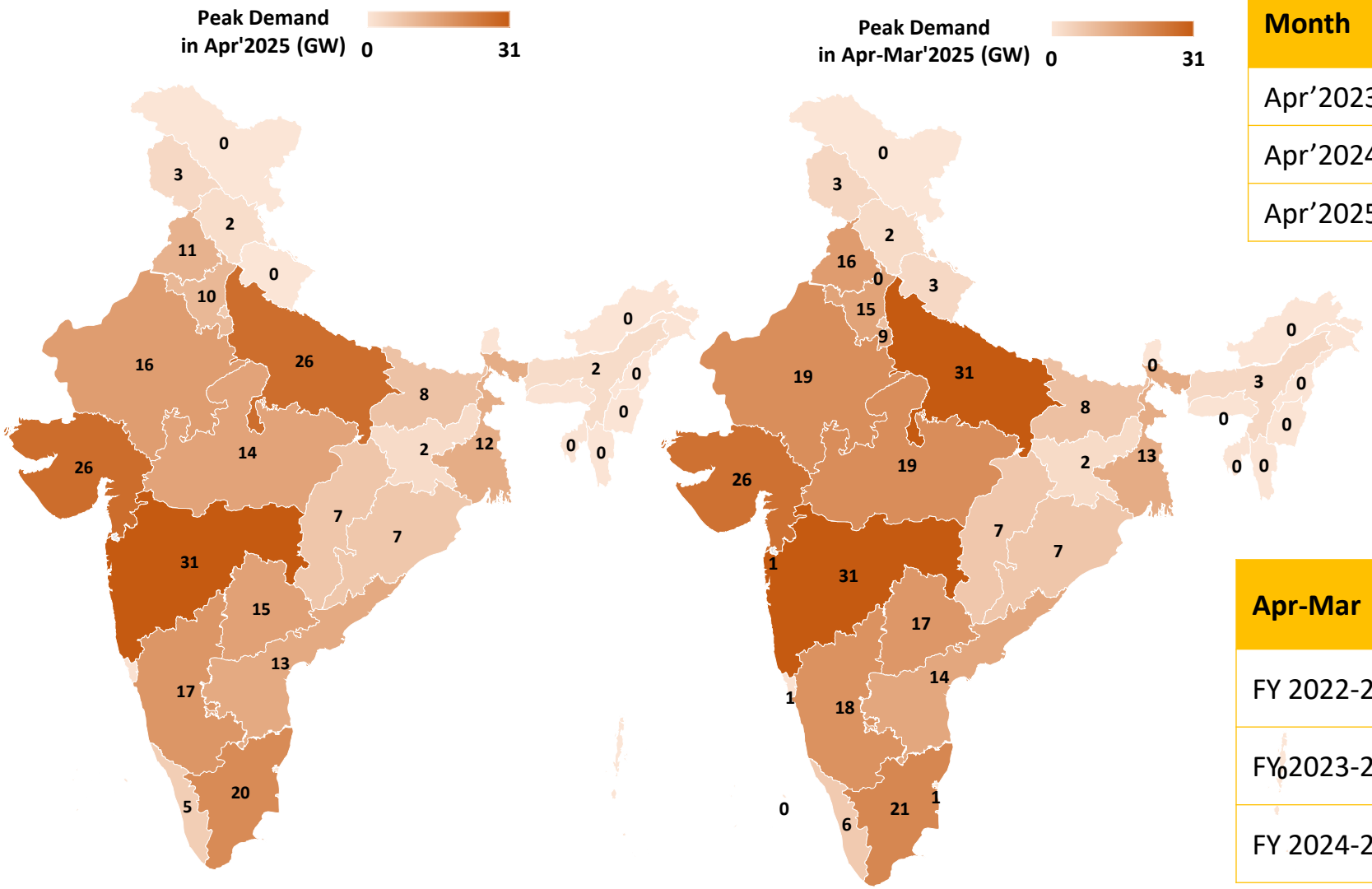


NOTE: Top 5 States under consumer-categories are selected on the basis of 2022-23

Source: CEA

National and State level Peak Electricity Demand

State-level Peak Electricity Demand (GW)



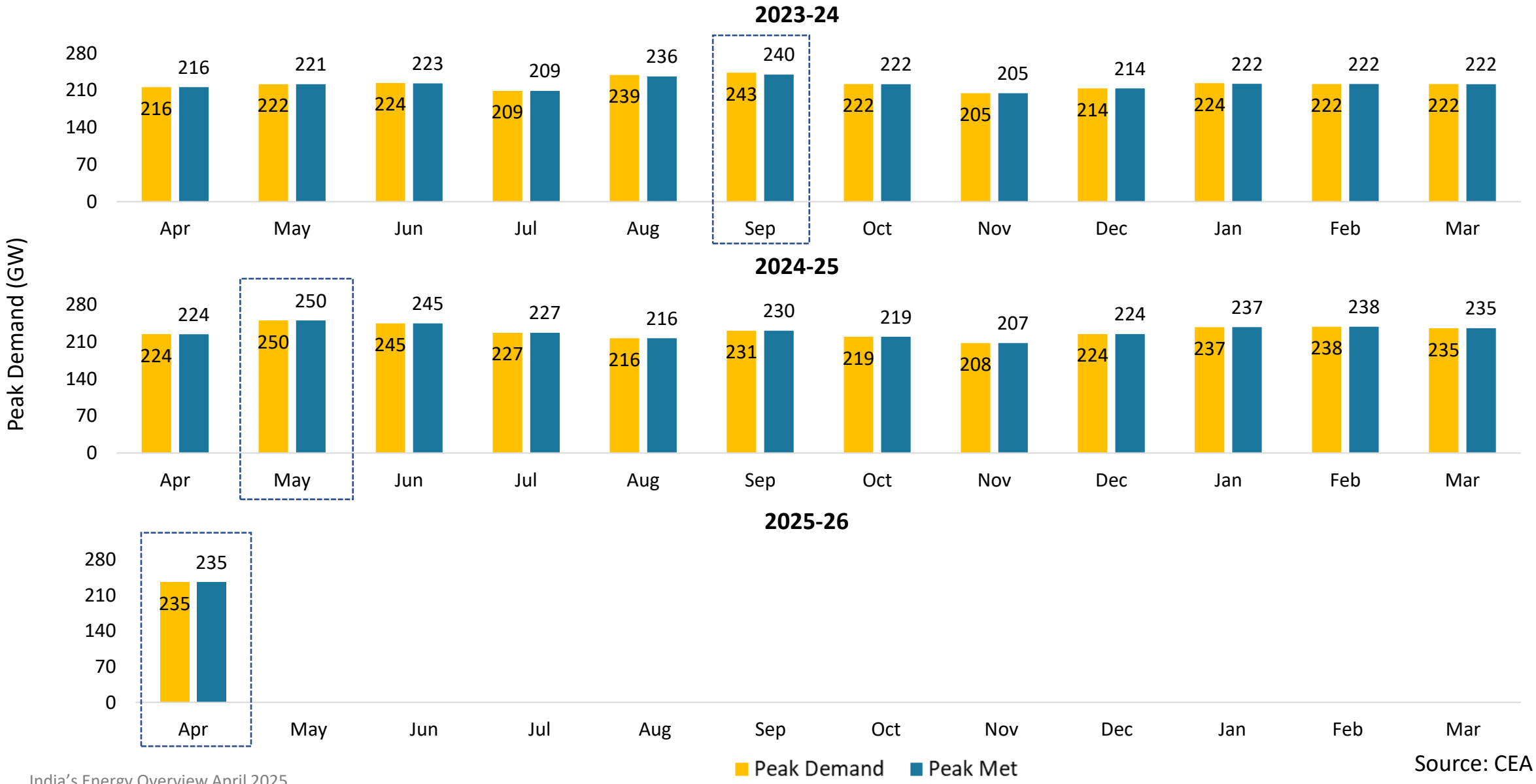
Month	Peak Demand (GW)	Peak Supply (GW)	Gap(GW) (+/-)
Apr'2023	216	216	0.2
Apr'2024	224	224	0.1
Apr'2025	235	235	0.0

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

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

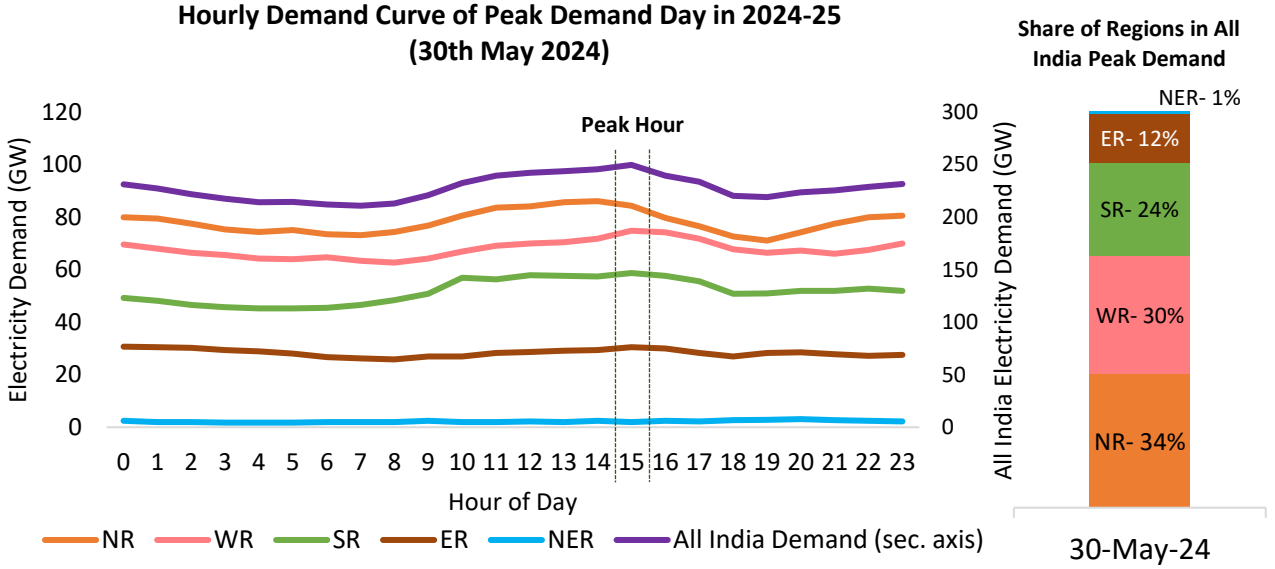
Source: CEA

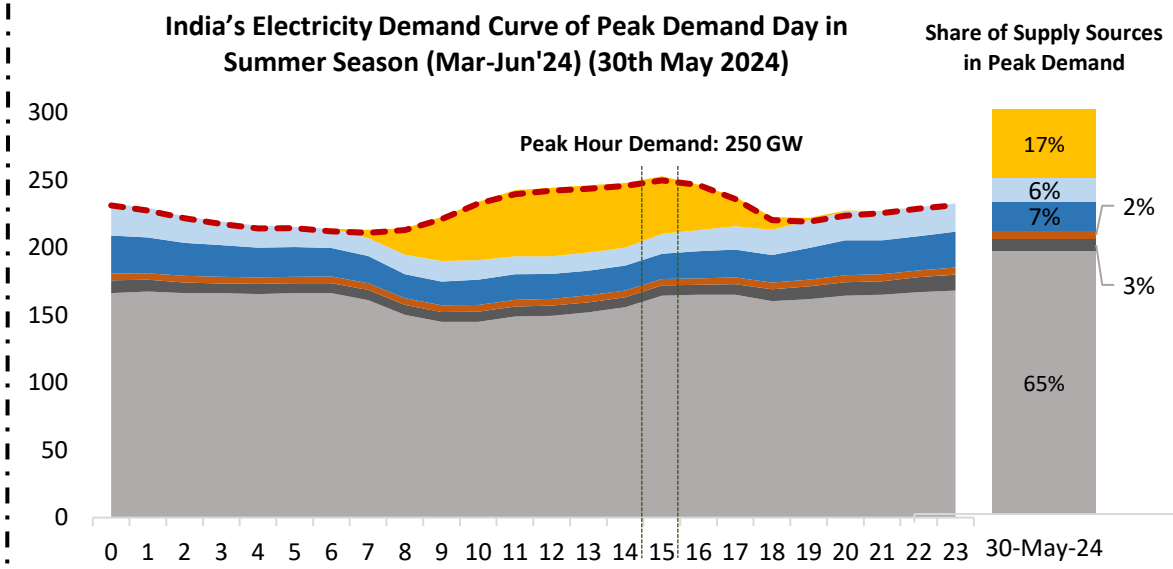
India’s Monthly Peak Electricity Demand and Supply

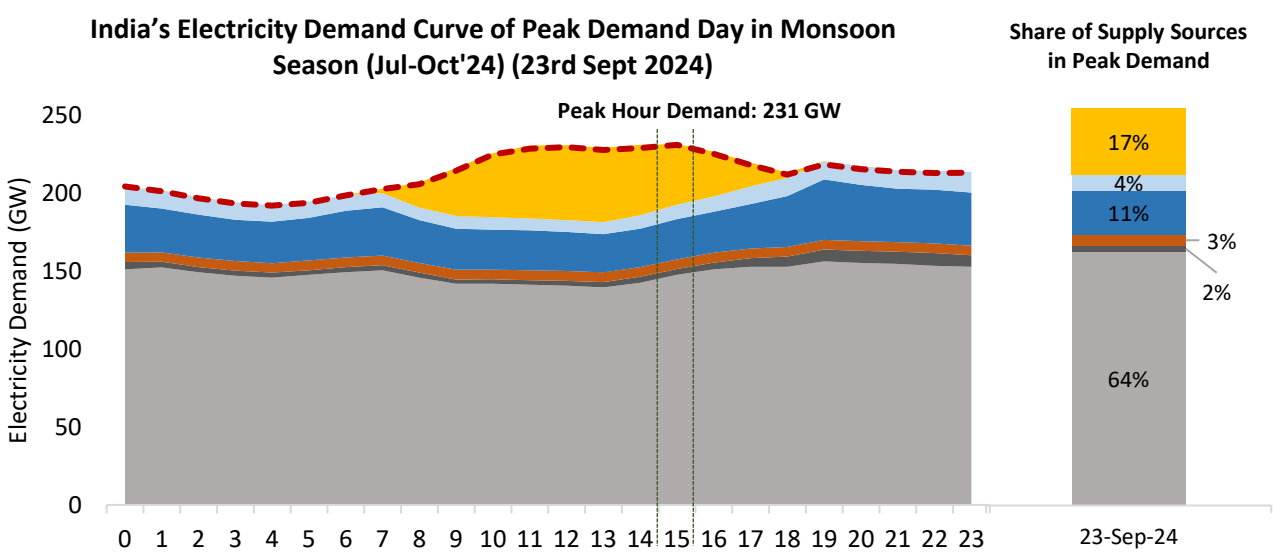


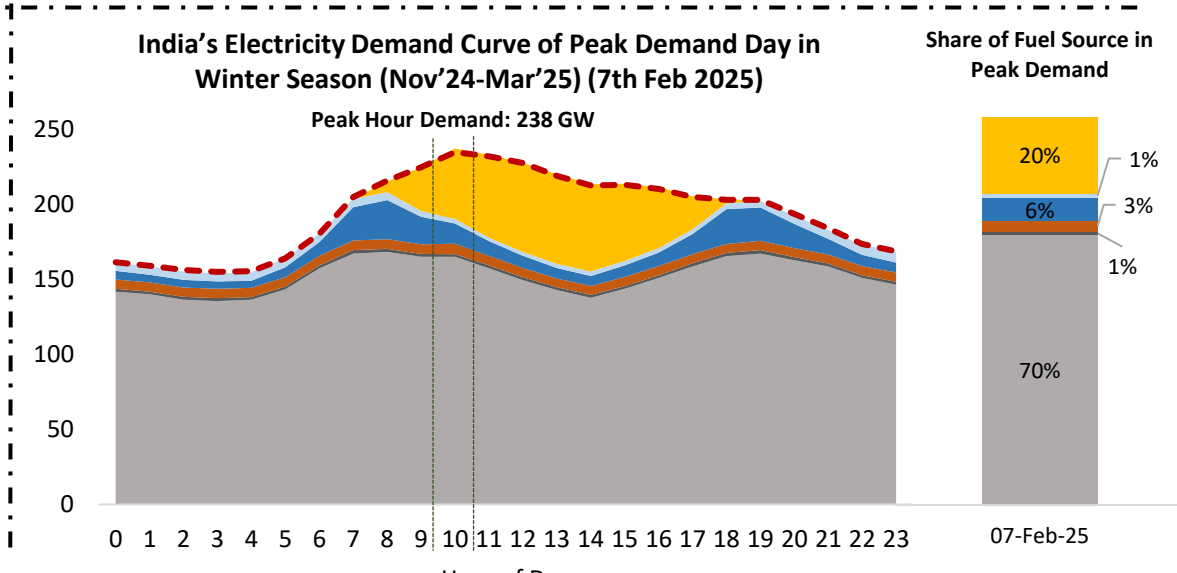
Source: CEA

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



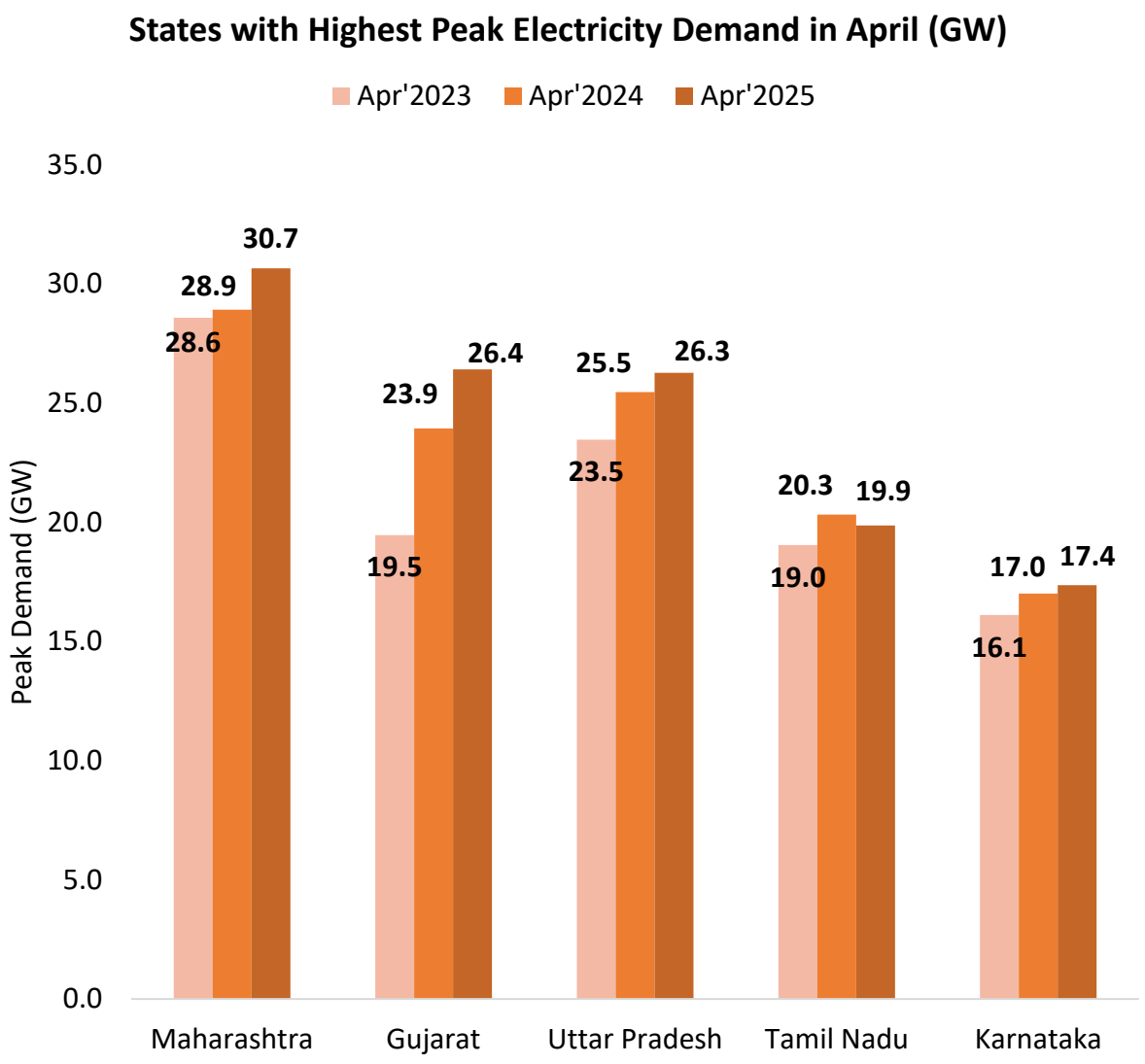


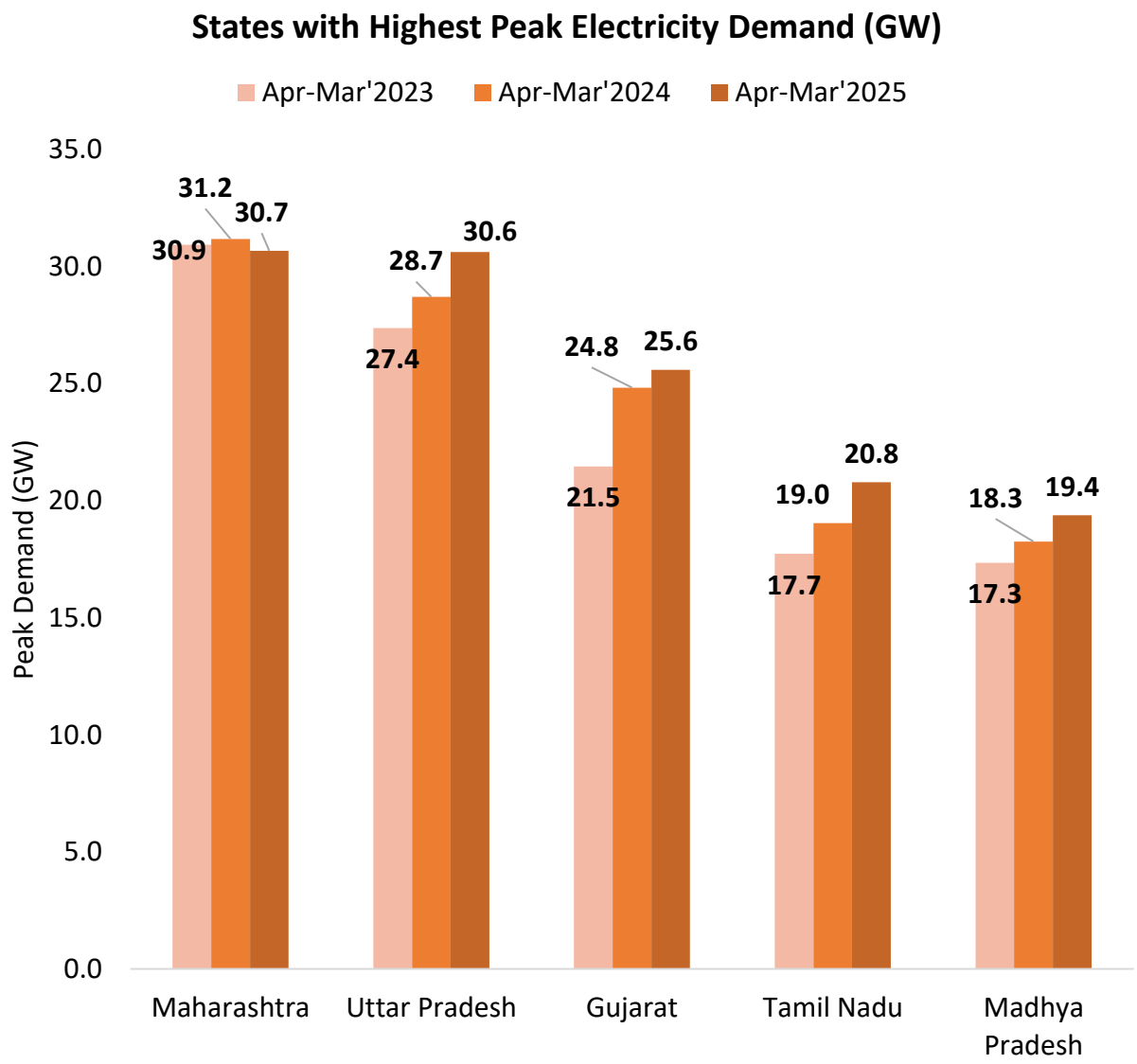




Source: POSOCO

Monthly Peak Electricity Demand of the top 5 states

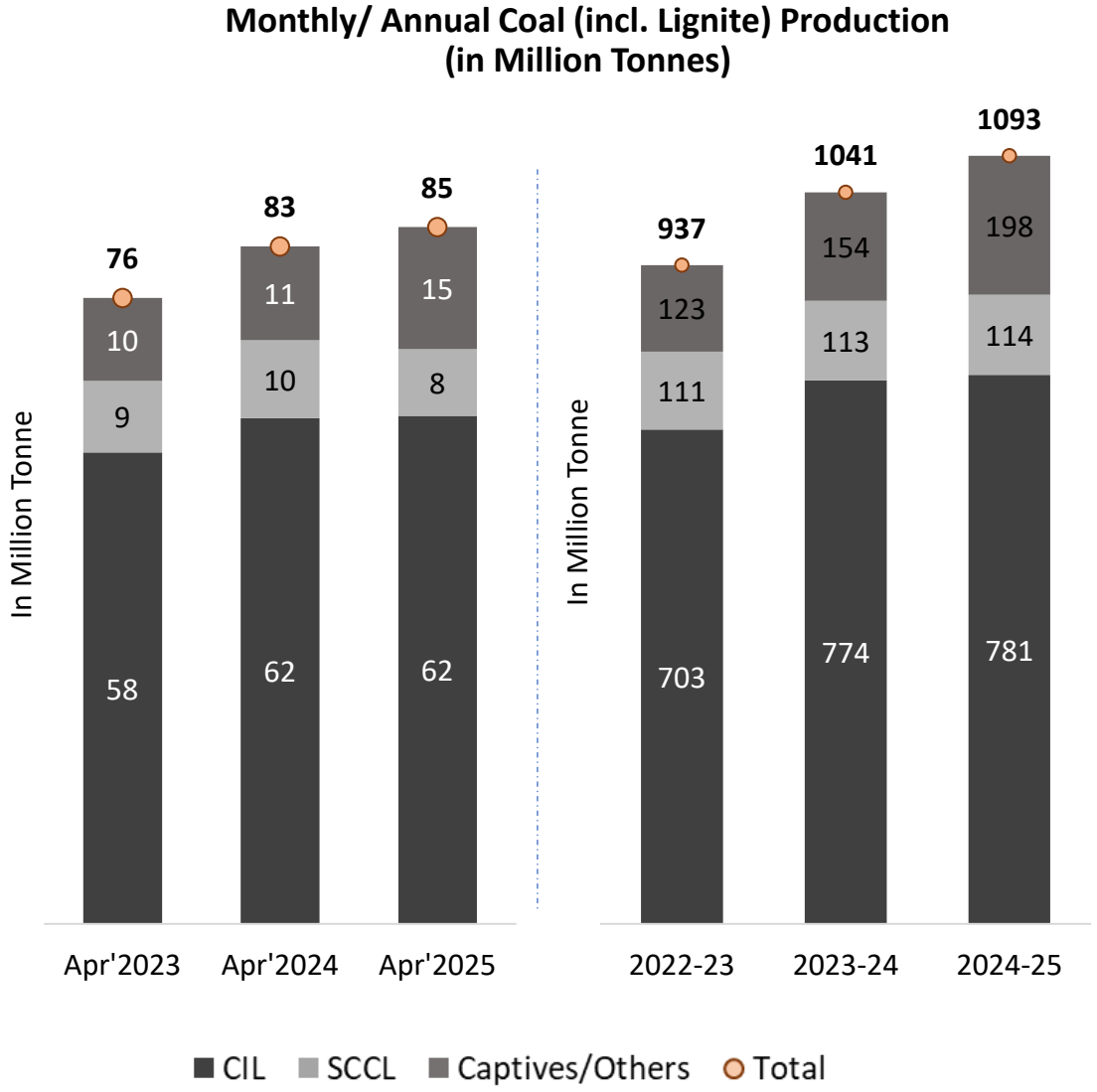


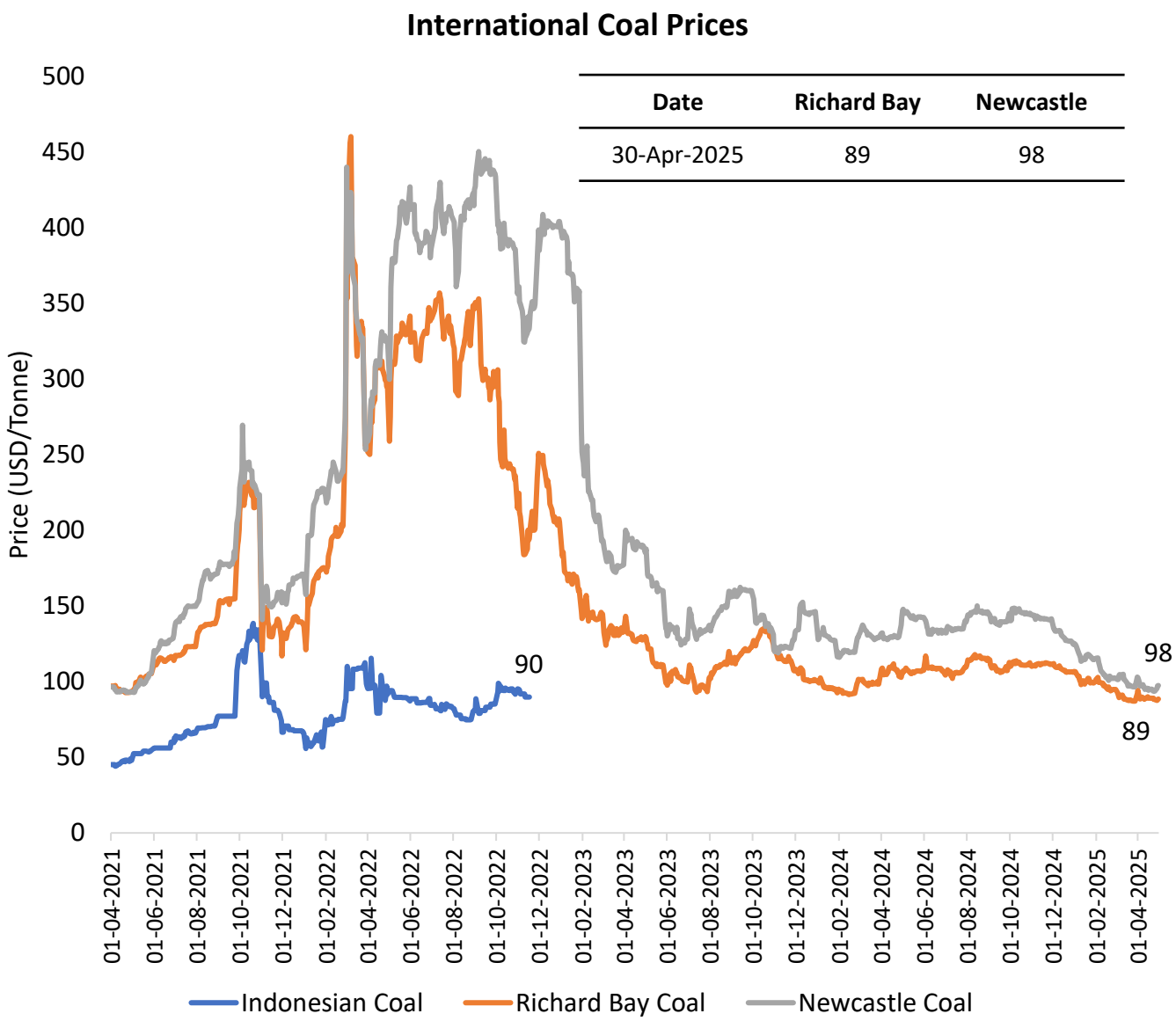


Note: The peak electricity demand data for April'25 is Provisional.

Source: CEA

Monthly Coal Statistics

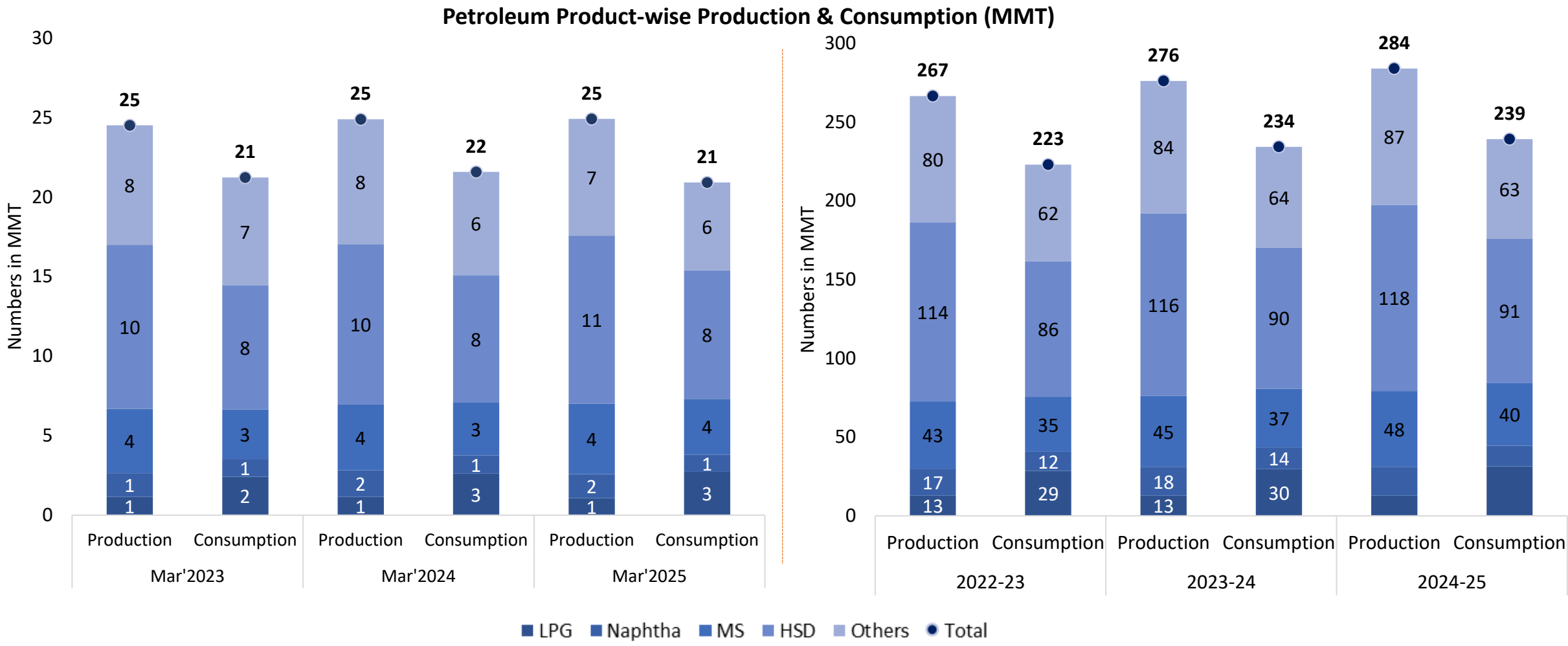




Date	Richard Bay	Newcastle
30-Apr-2025	89	98

Source: Ministry of Coal

Petroleum Products Market Scenario (1/3)



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

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

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

Source: PPAC

Petroleum Products Market Scenario (2/3)

Import/Export of Crude Oil and Petroleum Products ('000 Tonnes)							
Petroleum Products	Import/ Export	Monthly			Yearly		
		Mar'23	Mar'24	Mar'25	2022-23	2023-24	2024-25
Crude Oil	Import	20928	20815	22698	232700	234262	242996
	Export	0	0	0	0	0	0
	Net Import	**20928**	**20815**	**22698**	**232700**	**234262**	**242996**
LPG	Import	1410	1589	1857	18335	18514	20840
	Export	52	48	50	540	525	551
	Net Import	**1359**	**1541**	**1807**	**17796**	**17989**	**20289**
Diesel	Import	4	4	4	322	42	43
	Export	2483	2436	2825	28494	28204	28029
	Net Import	**-2479**	**-2431**	**-2822**	**-28172**	**-28162**	**-27986**
Petrol	Import	0	0	0	1069	717	235
	Export	1508	1338	1768	13127	13472	15830
	Net Import	**-1508**	**-1338**	**-1768**	**-12058**	**-12755**	**-15596**
Others	Import	2938	2759	2456	24871	29419	30197
	Export	2003	1850	1498	18854	20391	20683
	Net Import	**935**	**908**	**958**	**6017**	**9029**	**9514**

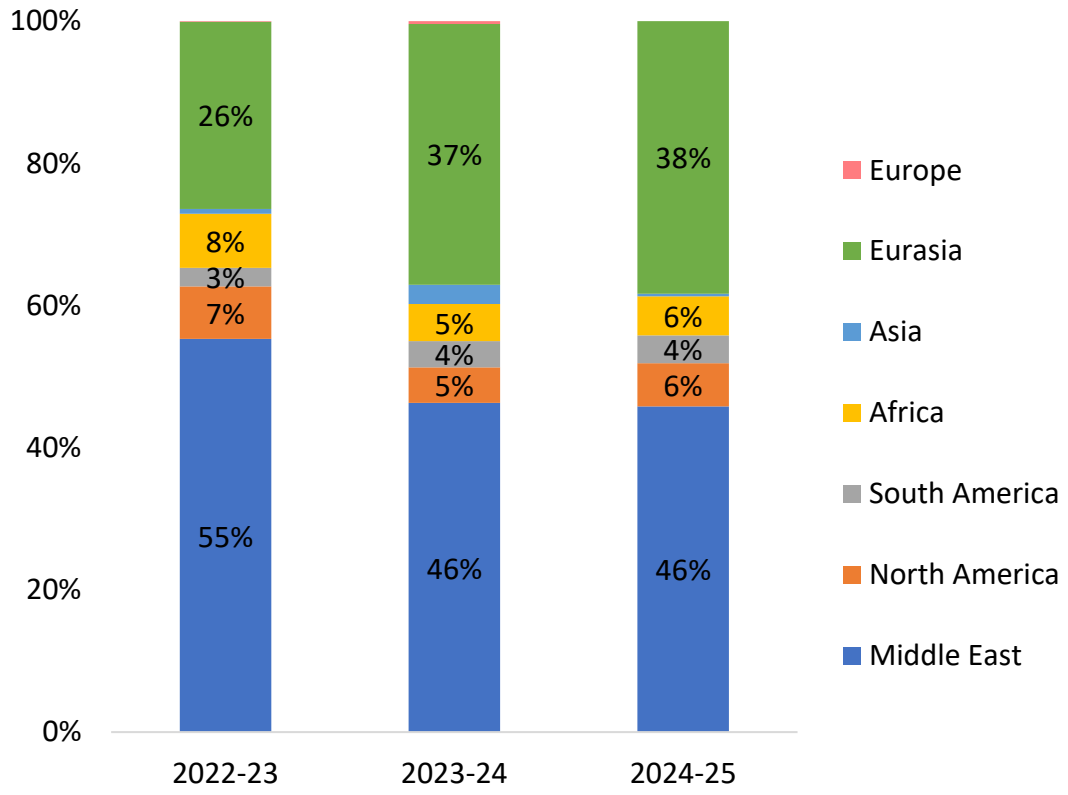
*Others include ATF, Naphtha, SKO, LDO, Lubes, FO, LSHS, Bitumen, pet coke, and others.

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

Source: PPAC

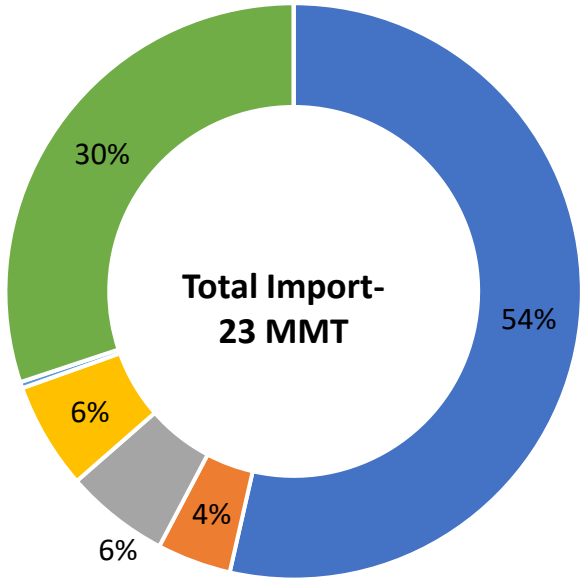
Petroleum Products Market Scenario (3/3)

Region-wise Share in Import of Crude Oil (%)

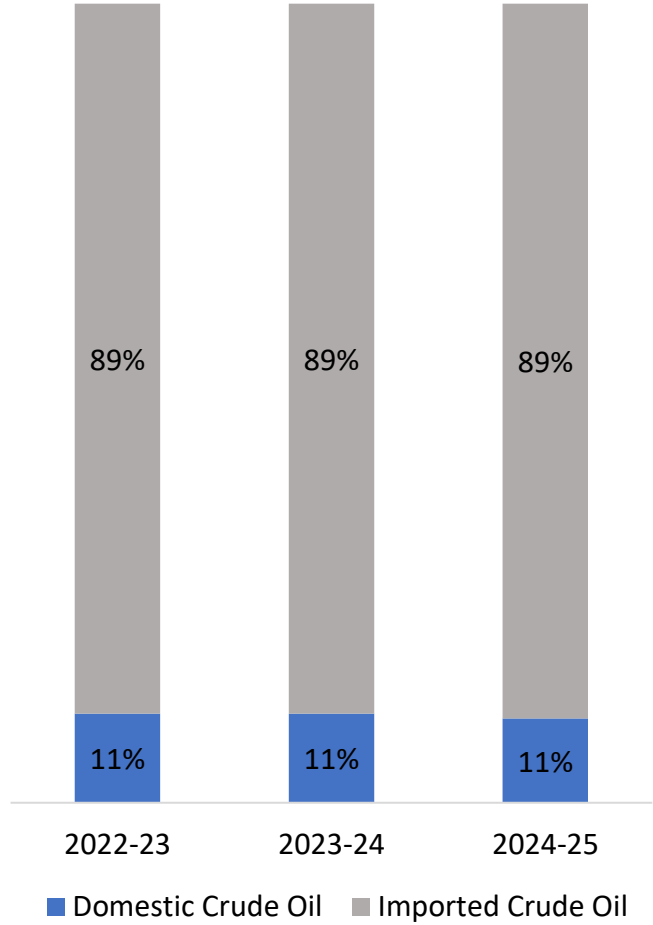


Total Import of Crude Oil (MMT)			
Total Import	2022-23	2023-24	2024-25
Crude Oil	**233**	**234**	**243**

Regional share of Imported Crude oil in March 2025



Domestic and Imported Crude Oil share in India (%)

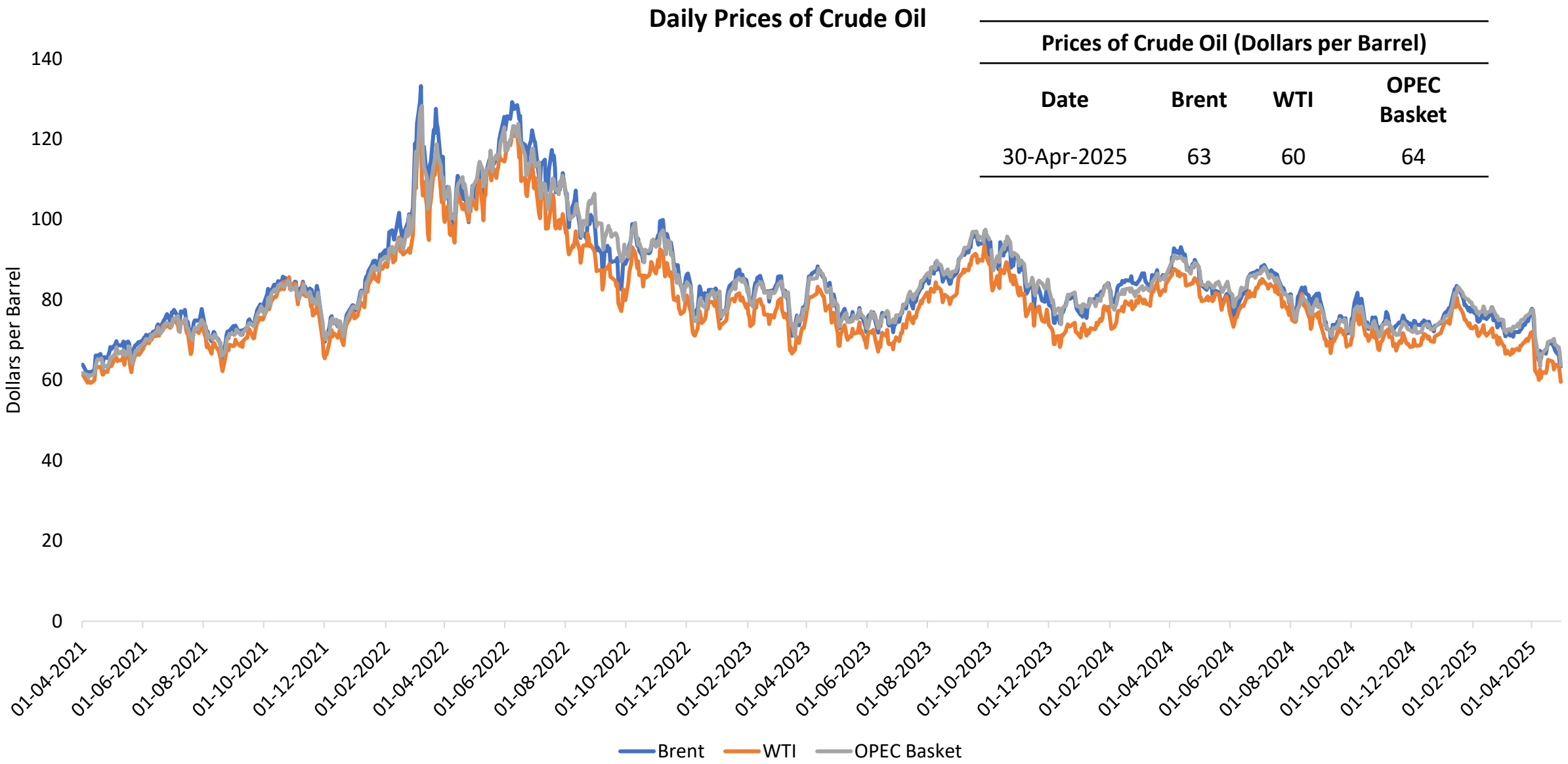


NOTE: The data is based on the latest available information.

P- Provisional

Source: MoPNG and PPAC

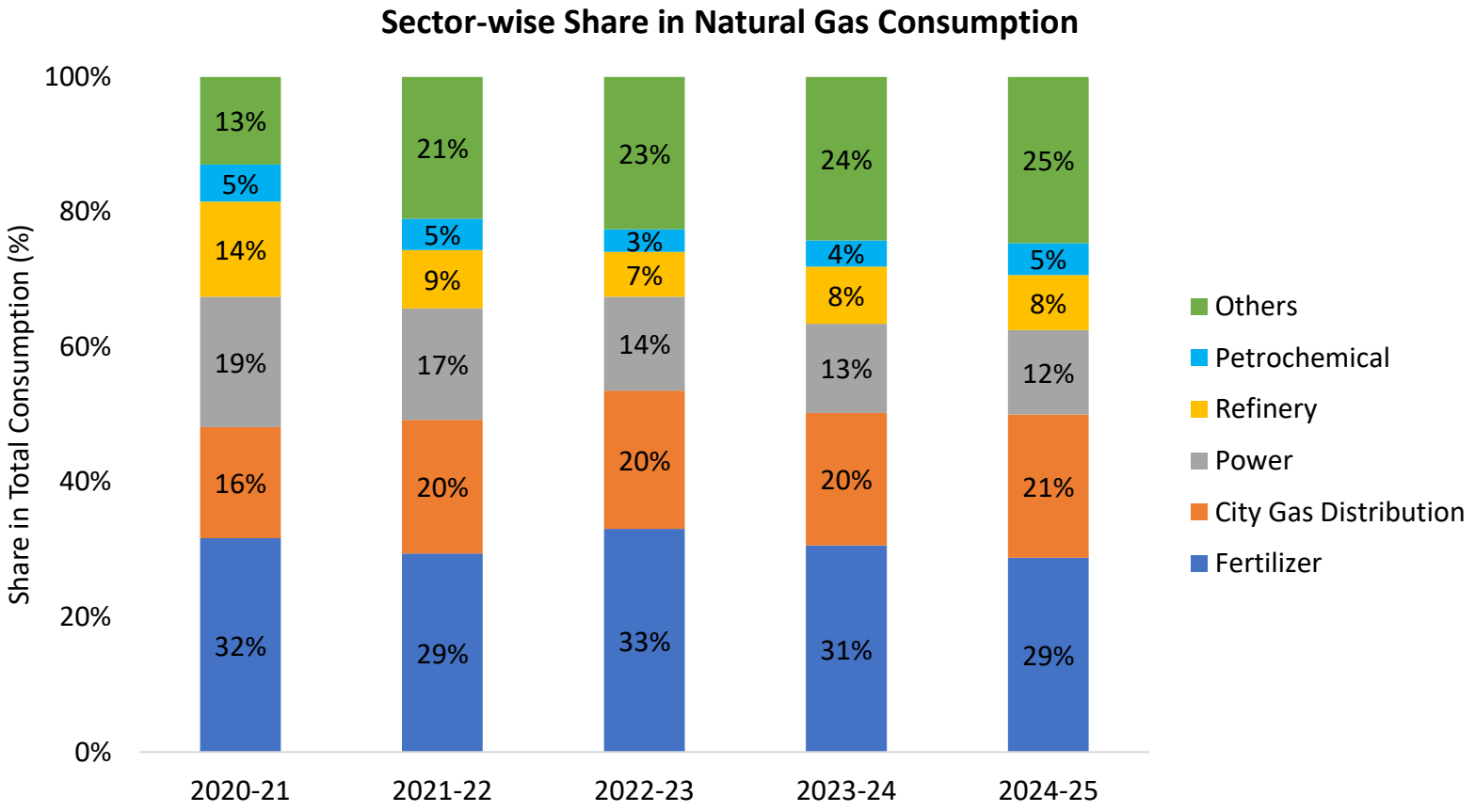
Daily Prices of Crude Oil

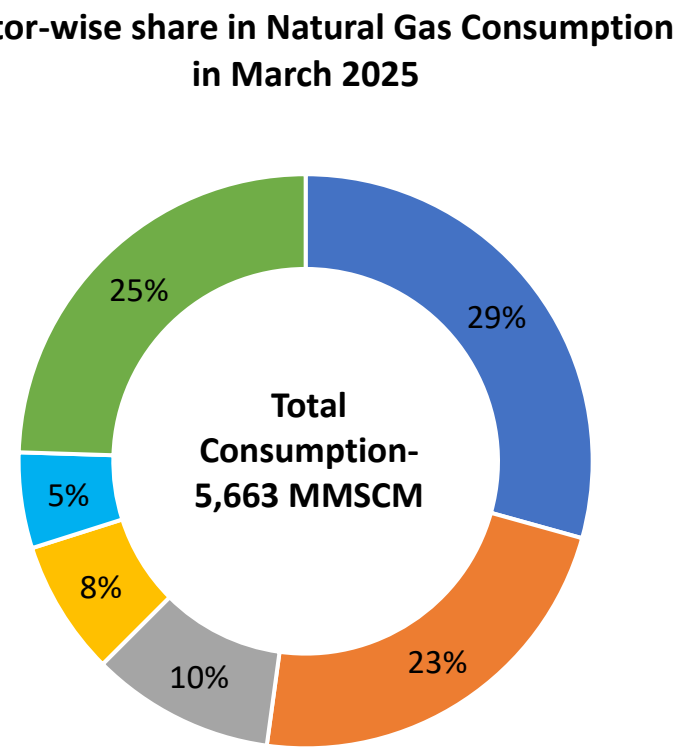


Prices of Crude Oil (Dollars per Barrel)

Date	Brent	WTI	OPEC Basket
30-Apr-2025	63	60	64

Gas Market Scenario (1/2)





Total Consumption of Natural Gas (NG) (MMSCM)					
Total Consumption	2020-21	2021-22	2022-23	2023-24	2024-25
Natural Gas	**56,116**	**61,491**	**58,702**	**68,759**	**71,146**

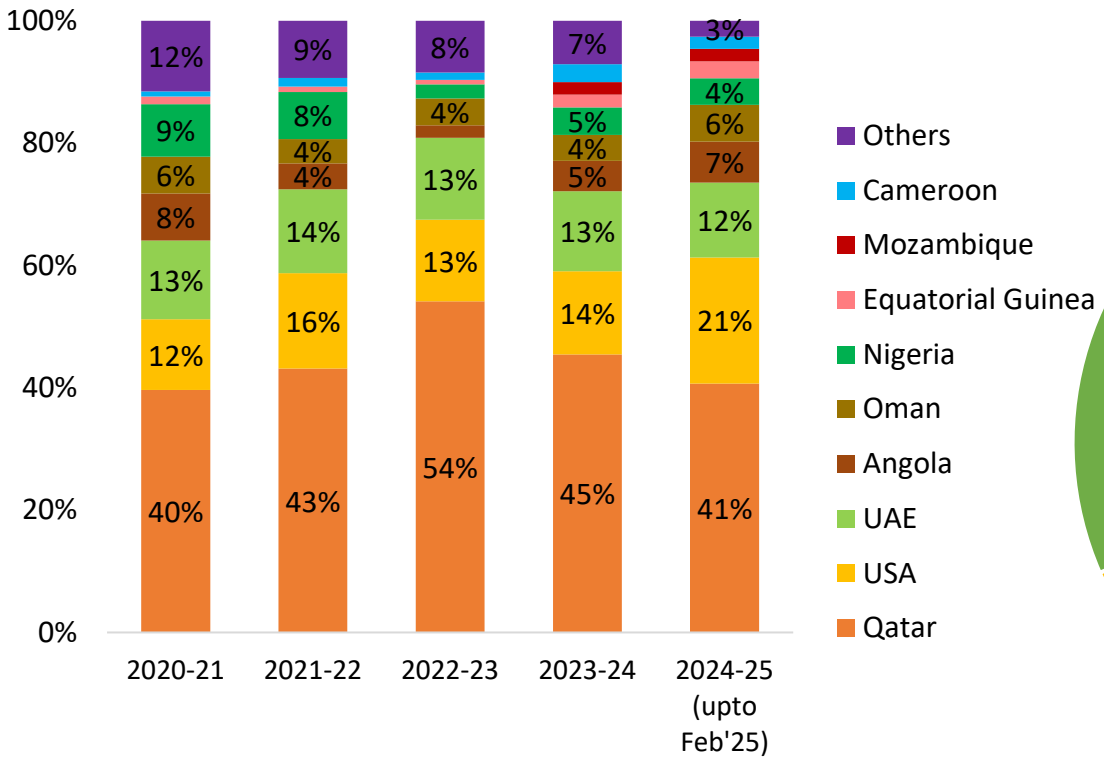
Others include- Internal Combustion of Pipeline System, Industrial, Sponge iron/steel, LPG shrinkage, Manufacturing, Agriculture (tea plantation), Others

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

Source: PPAC

Gas Market Scenario (2/2)

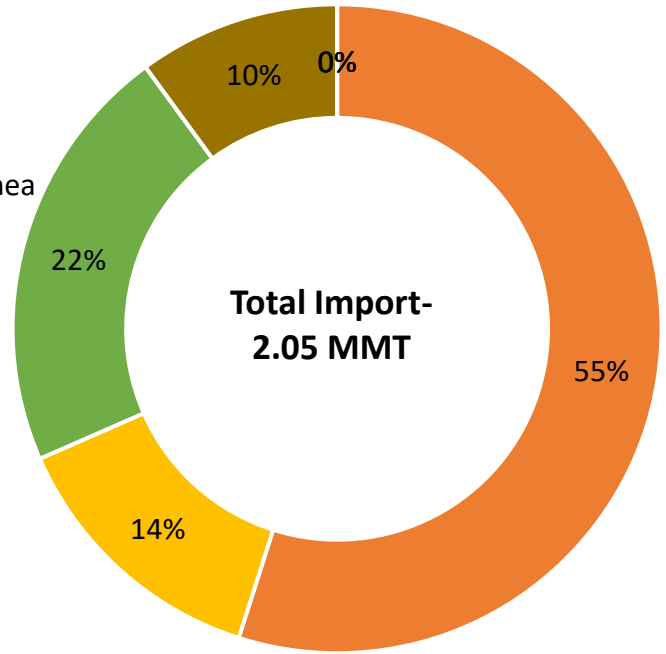
Region-wise Share in Import of LNG (%)



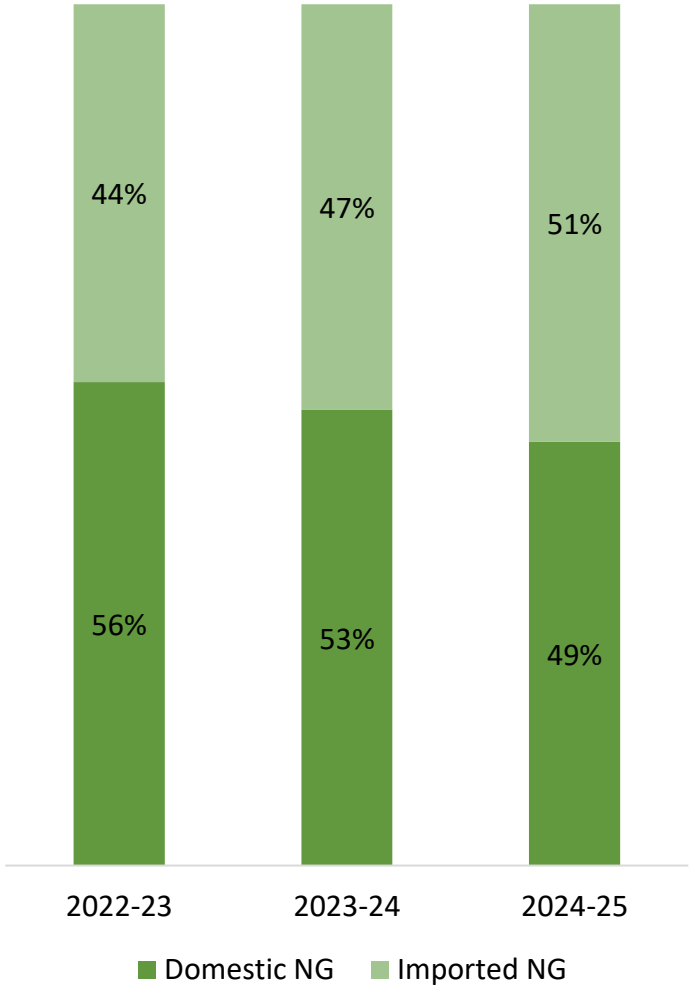
Others include- Trinidad, Cameroon, Egypt, France, Algeria, Belgium, Indonesia, Turkey, Russia, Spain, Malaysia, Brunei, Netherlands, Norway, and others.

Total Import of Liquified Natural Gas (LNG) (MMT)			
Total Import	2022-23	2023-24	2024-25
LNG	**19.85**	**24.00**	**27.70**

Country Share of Imported LNG in February'2025



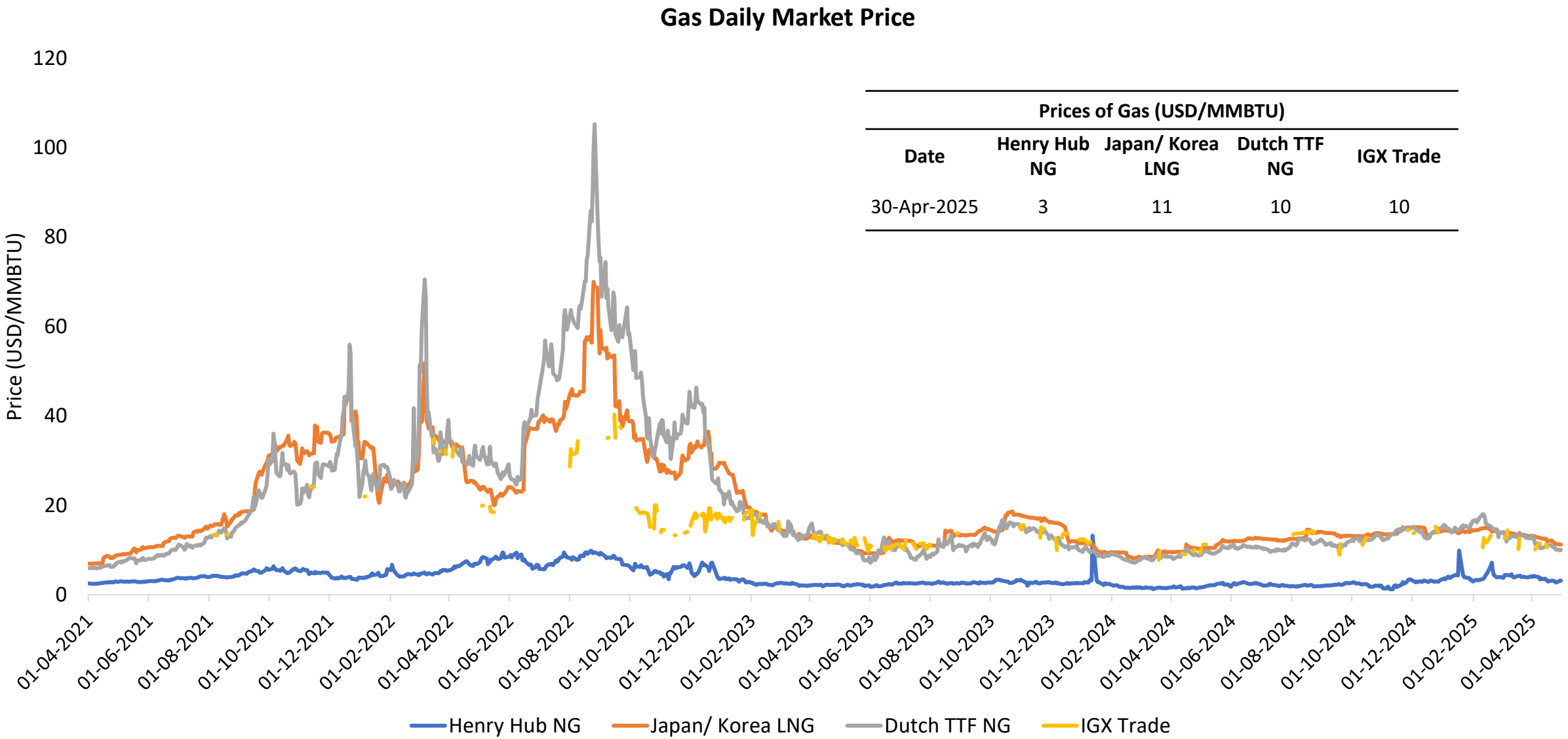
Domestic and Imported Natural Gas share in India (%)



NOTE: The data is based on the latest available information.

Source: MoCI and PPAC

Daily Prices of Gas

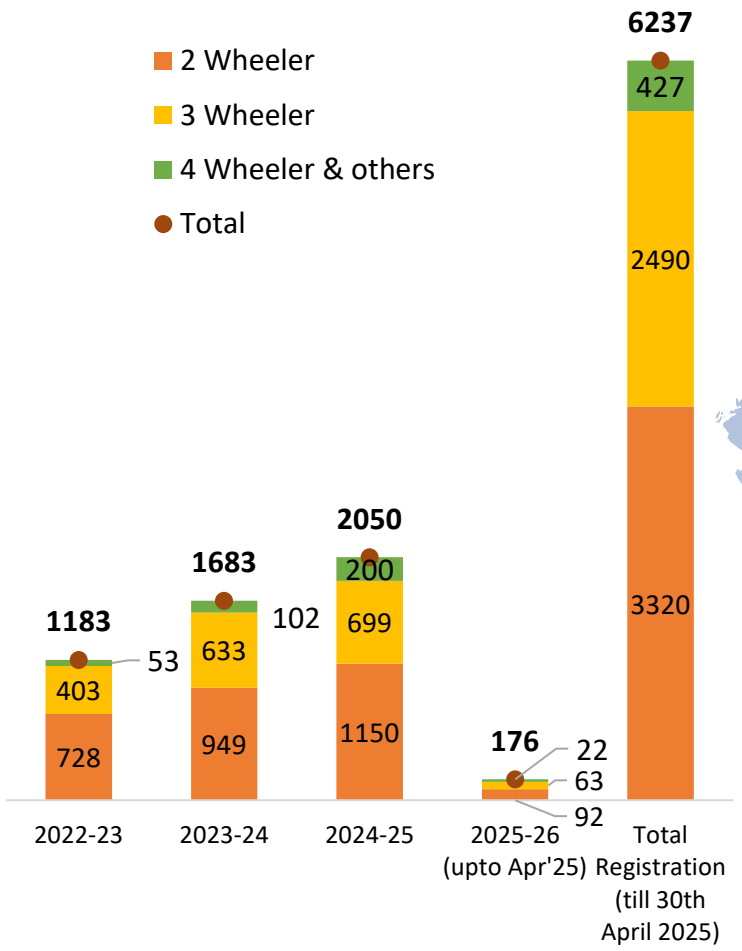


Prices of Gas (USD/MMBTU)				
Date	Henry Hub NG	Japan/ Korea LNG	Dutch TTF NG	IGX Trade
30-Apr-2025	3	11	10	10

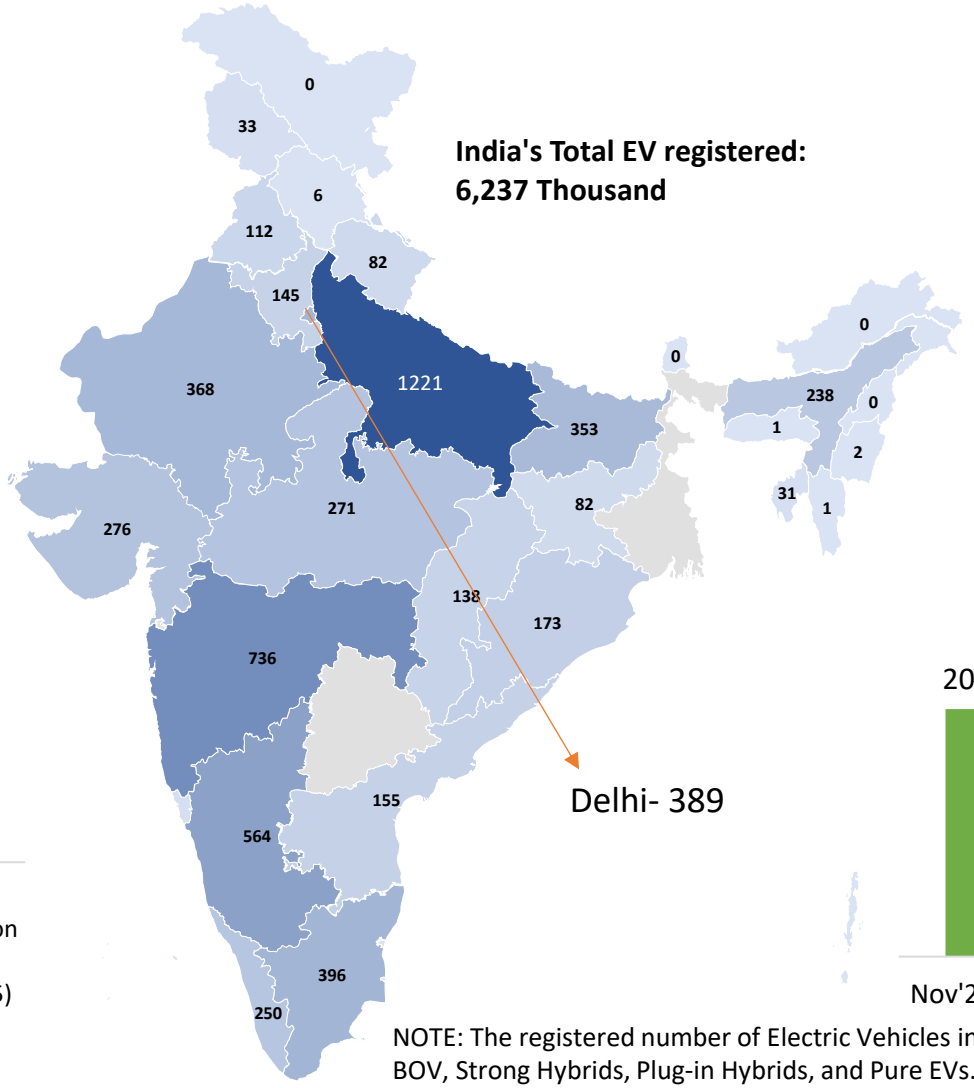
MMBTU- Million Metric British Thermal Unit

Status of Electric Mobility in India

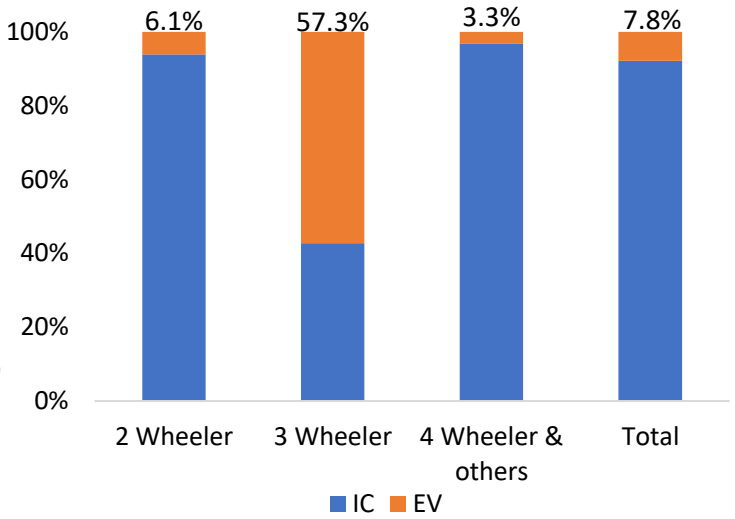
National EV registration (Number in Thousands)



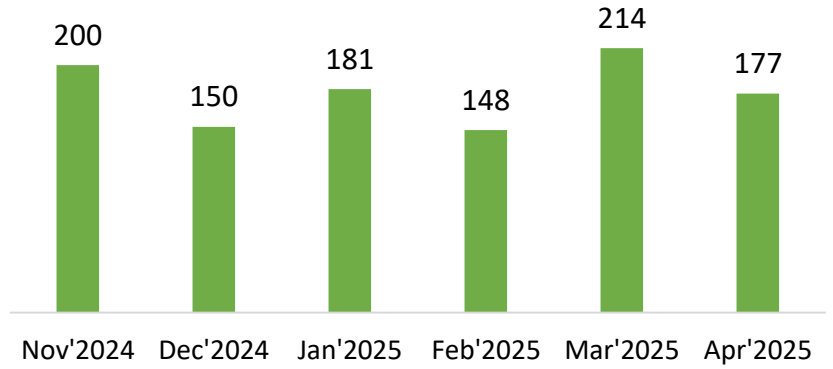
Cumulative State-wise EV registration as on 30th April 2025 (in Thousands)



EV and ICE sale composition in 2024-25



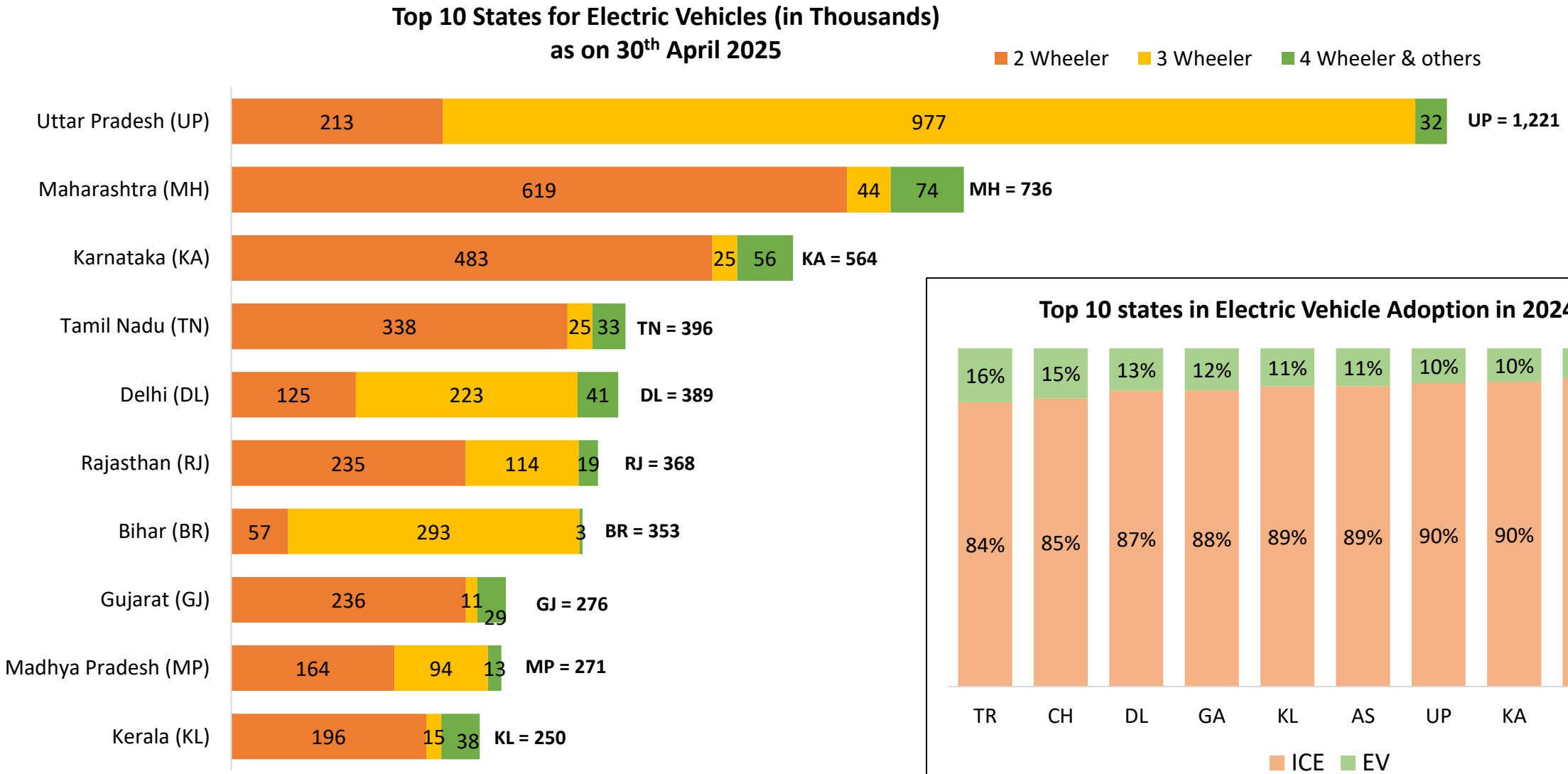
Provisional Monthly EV registered (in Thousands)

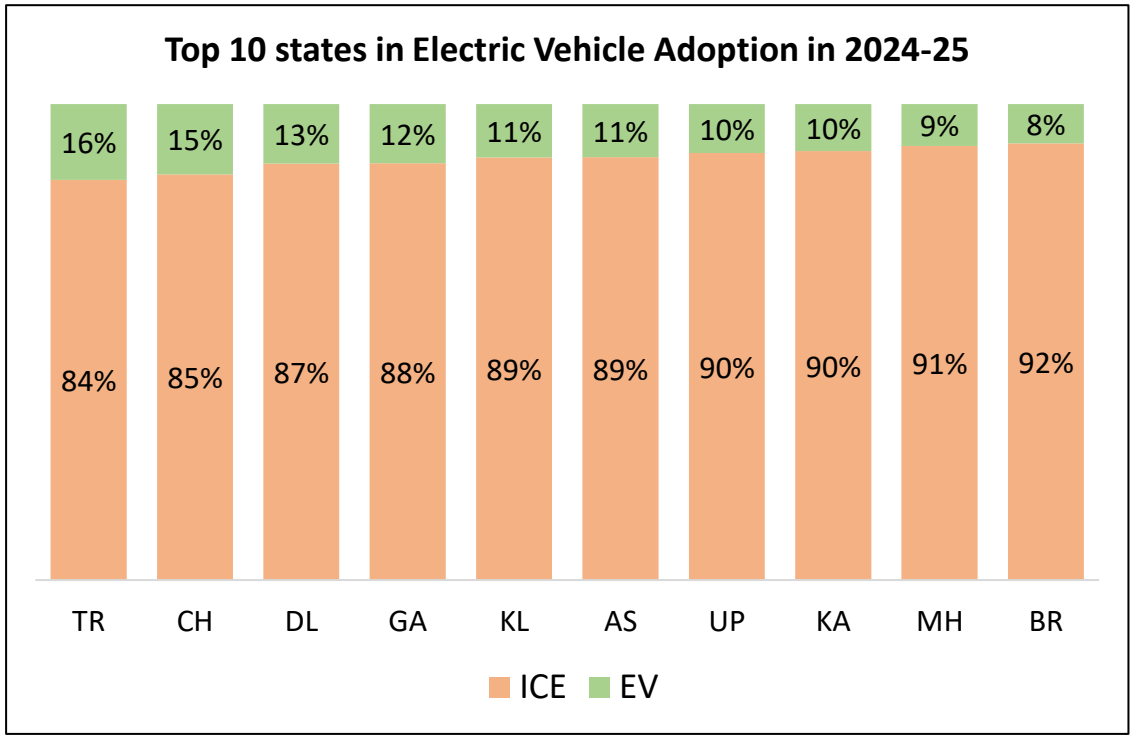


NOTE: The registered number of Electric Vehicles includes Electric BOV, Strong Hybrids, Plug-in Hybrids, and Pure EVs.

Source: VAHAN Dashboard

Status of Electric Mobility in India





NOTE: CH- Chandigarh, GA- Goa, AS- Assam, TR- Tripura

Source: VAHAN Dashboard

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 relaesed 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.

In India, approximately 10.62 GW of solar capacity coupled with 12.52 GWh of BESS has been tendered as of April 2025.

Green Hydrogen (H_2)

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 April 2025

- The Ministry of New and Renewable Energy has released the Green Hydrogen Certification Scheme of India under the National Green Hydrogen Mission. The scheme is a foundational step towards creating a robust framework for certifying green hydrogen production and ensuring transparency, traceability, and market credibility. The scheme prioritizes precise emissions reporting, rigorous monitoring, and alignment with international standards, aiming to enhance investor confidence and foster the development of a reliable green hydrogen ecosystem in India.

- The Government of Maharashtra has launched the Mukhyamantri Saur Krushi Vahini Yojana 2.0 (MSKVY 2.0) with the goal of achieving 30% feeder solarization by 2025 as a 'Mission 2025' . As part of this initiative, the state plans to fast-track the implementation of 7 GW of decentralized solar projects. These projects, ranging in capacity from 0.5 MW to 25 MW, will be set up within a 5 to 10 km radius of agriculture load-dominated distribution substations, providing daytime power supply to farmers.

- IndiGrid has commissioned India's first regulated utility-scale standalone battery energy storage system (BESS) project, named Kilokari BESS Private Limited, in Delhi with a capacity of 20 MW/40 MWh. The project is intended to support integration of renewable energy into the distribution-level grid system. Additionally, the system aims to facilitate grid stabilisation, manage peak electricity demand, and address various ancillary requirements.

- The Central Electricity Authority has launched the STELLAR, a state-of-the-art, totally indigenously developed Resource Adequacy model. This model is designed to integrate generation, transmission, and storage expansion planning with demand response. This advanced tool aims to support states in formulating comprehensive Resource Adequacy Plans, aligning with the guidelines issued by the Ministry of Power in June 2023.

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