

India's Energy Overview

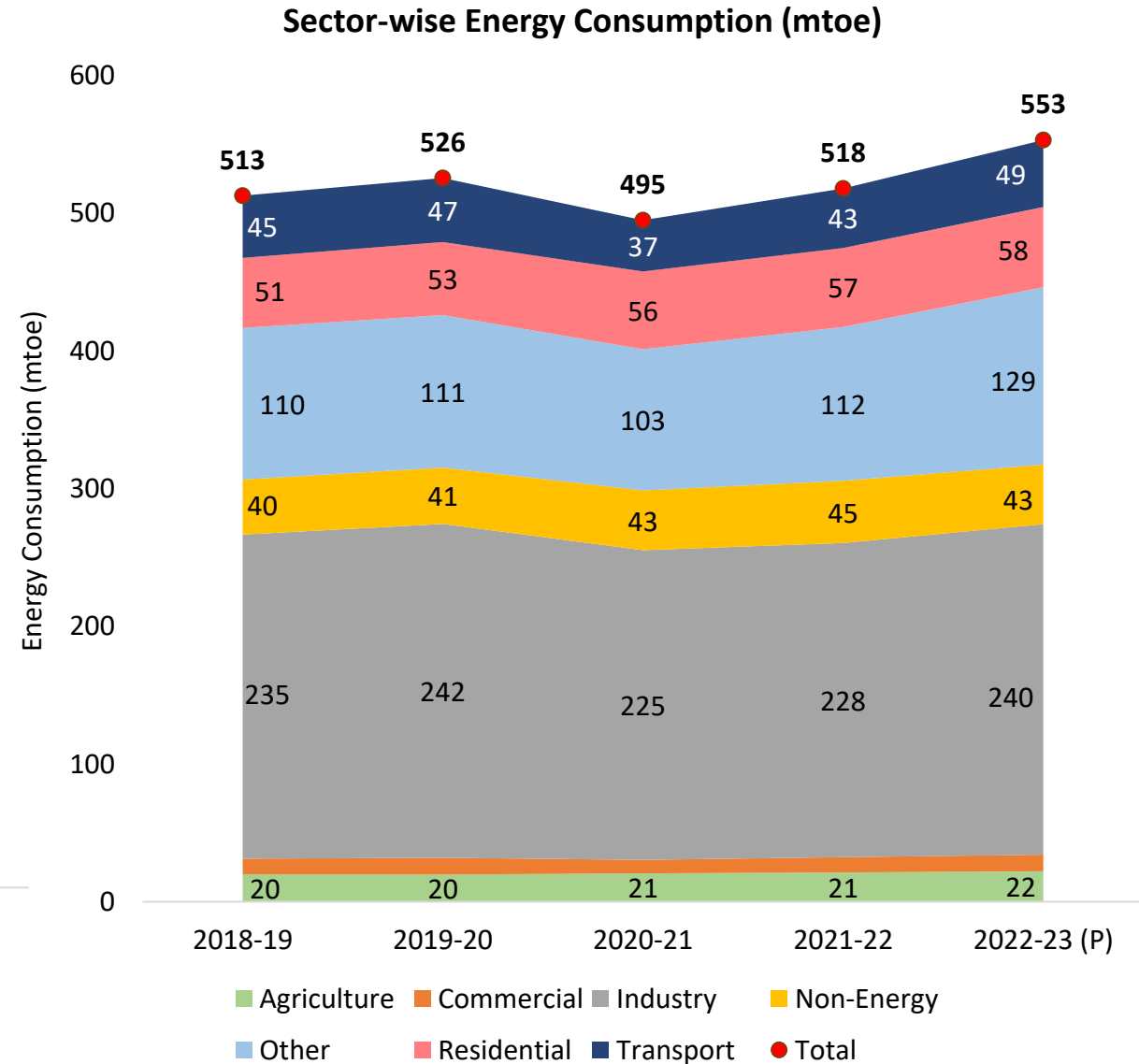
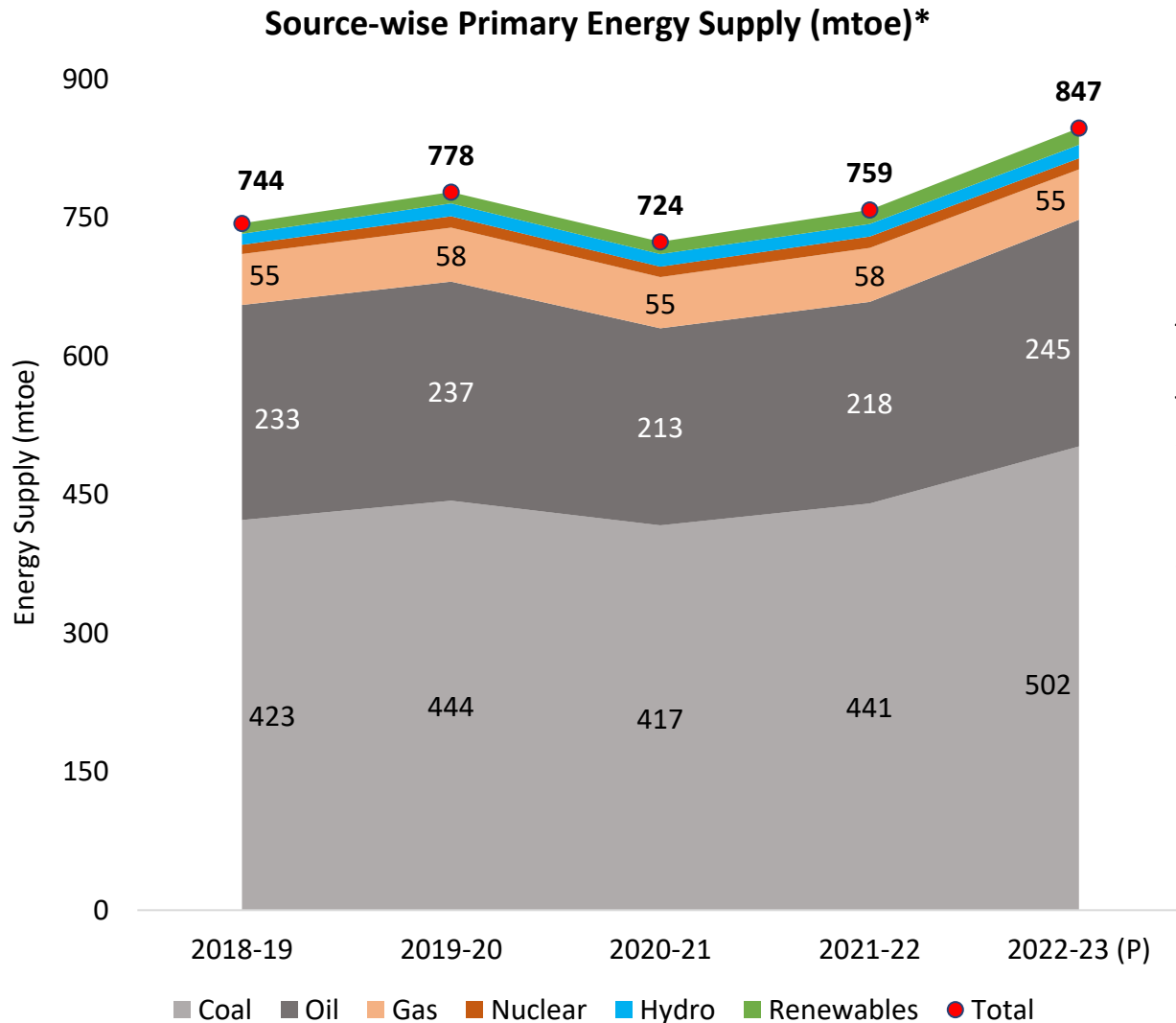
August 2024



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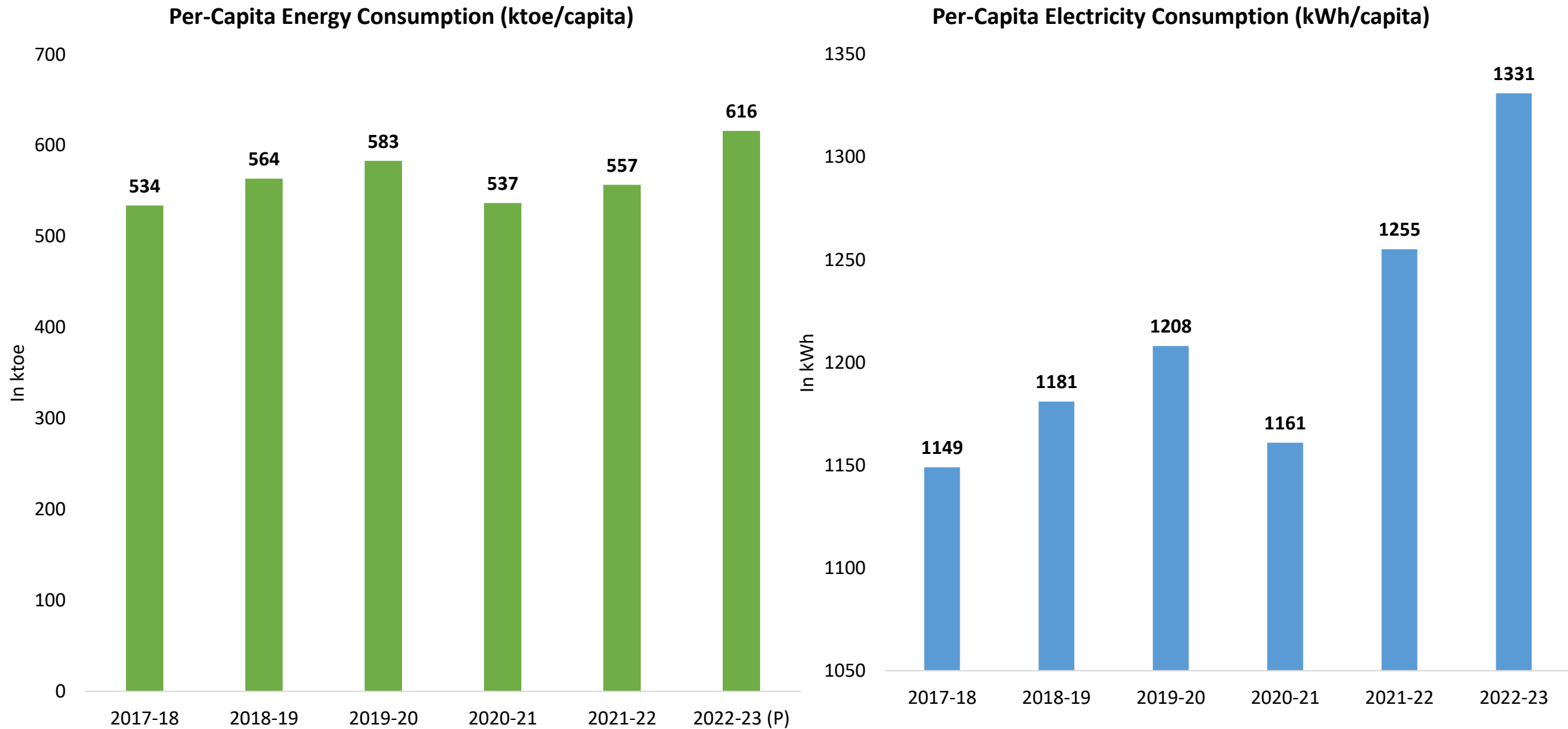
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Primary Energy Mix* in India



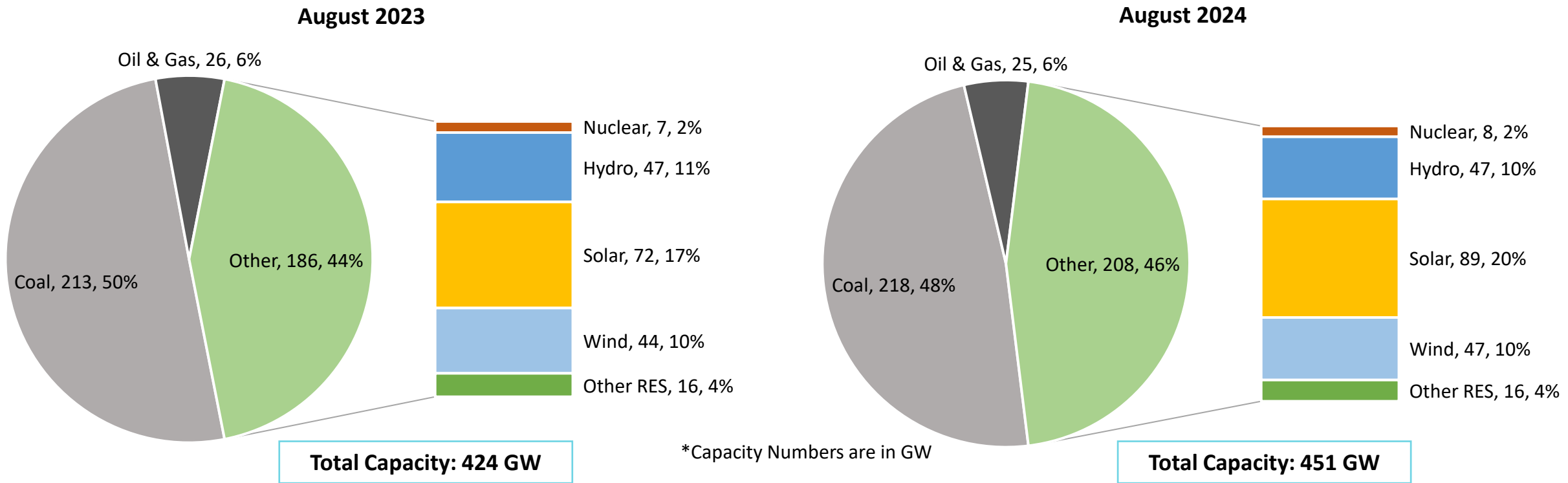
*Excluding biofuels, waste, and other non-commercial source of energy

Per-Capita Energy and Electricity Consumption



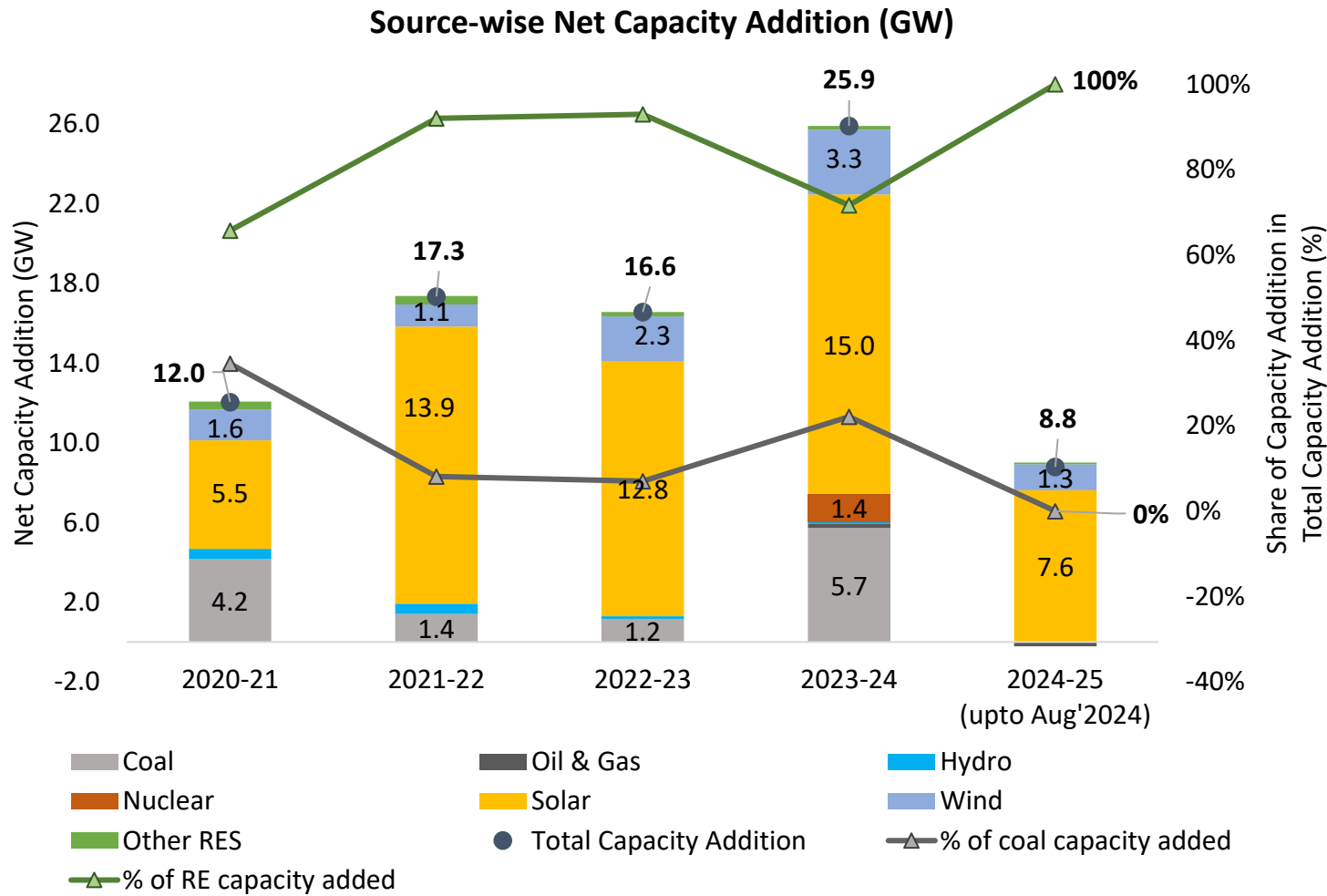
Note: Per Capita energy consumption is calculated on energy supply basis.

India's Electricity Capacity Mix (Utility-scale)

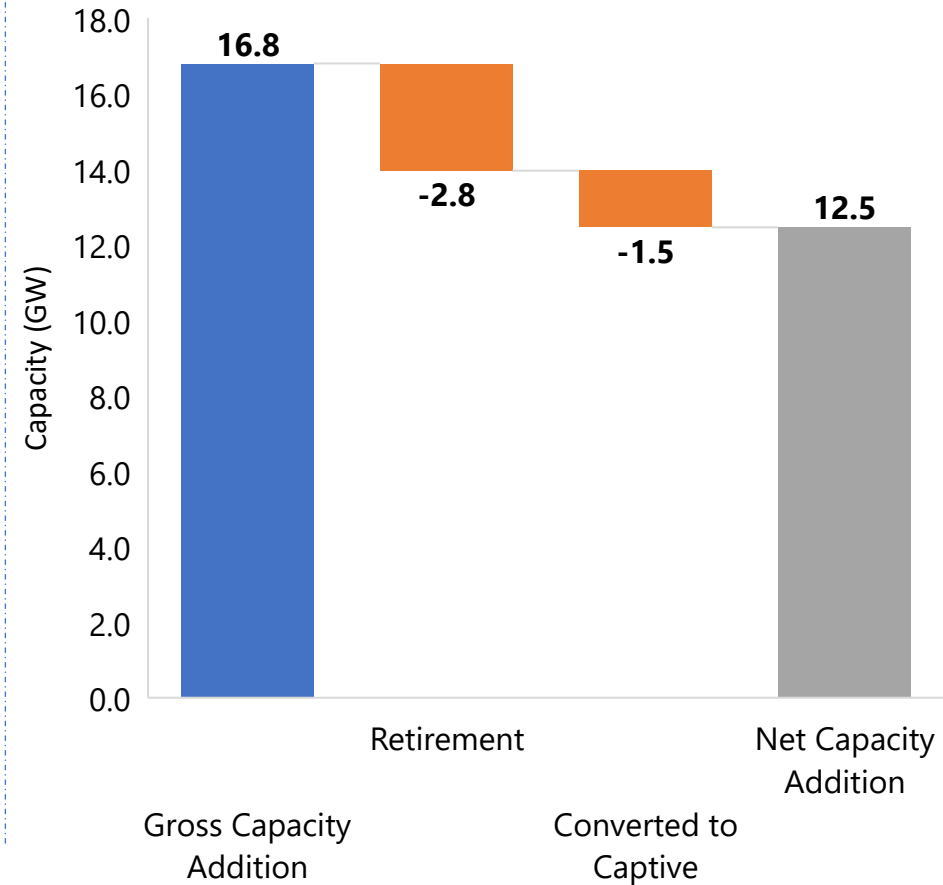


- India's electricity generating capacity is 451 GW as on Aug'2024 [coal 218 GW (48%), solar 89 GW (20%), hydro 47 GW (10%), and wind 47 (10%)].
- As on Aug'2024, the share of non-fossil-based electricity capacity is 46% against the set target of 50% non-fossil capacity by 2030.
- As on Aug'2024, India's renewable energy capacity (including large hydro) stood at 200 GW out of 451 GW.

India's Electricity Capacity Addition in last 5 years



Net Coal Capacity Addition during 2020-21 to 2024-25 (up to Aug'2024)



- A total of 66.9 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 12.5 GW, mostly in the central sector.

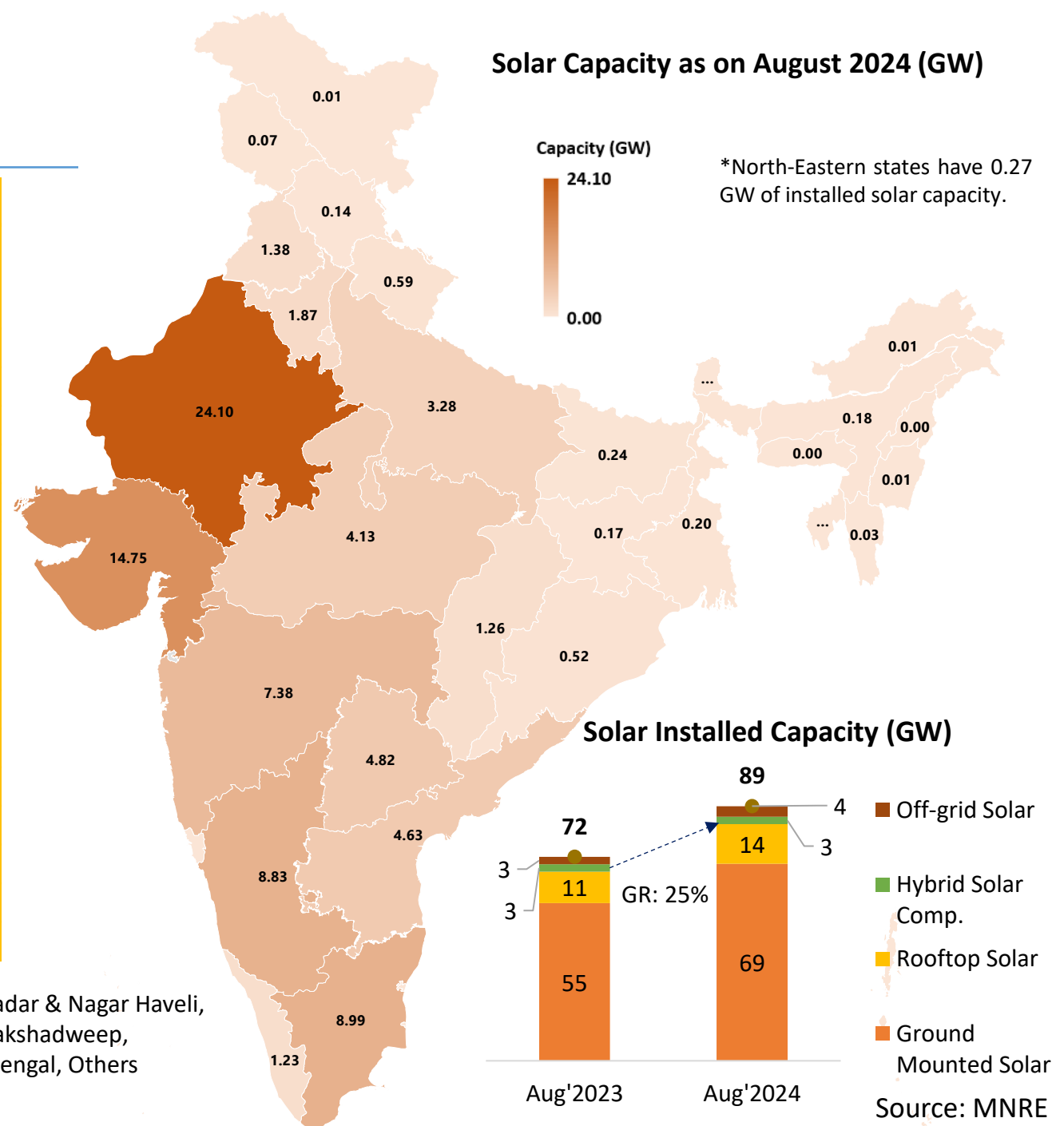
State-wise Solar Capacity

as on August 2024

State-wise installed capacity of Solar Power (GW)					
States	Ground Mounted	Rooftop	Solar Component in Hybrid	Off Grid	Total Solar Power
Rajasthan	20.05	1.27	1.98	0.81	24.10
Gujarat	9.85	4.20	0.61	0.09	14.75
Tamil Nadu	8.18	0.75	0.00	0.07	8.99
Karnataka	8.19	0.60	0.00	0.04	8.83
Maharashtra	4.35	2.49	0.00	0.54	7.38
Telangana	4.36	0.45	0.00	0.01	4.82
Andhra Pradesh	4.32	0.22	0.00	0.09	4.63
Madhya Pradesh	3.62	0.40	0.00	0.10	4.13
Uttar Pradesh	2.70	0.27	0.00	0.32	3.28
Haryana	0.27	0.70	0.00	0.90	1.87
Punjab	0.89	0.41	0.00	0.08	1.38
Chhattisgarh	0.78	0.10	0.00	0.39	1.26
Kerala	0.32	0.88	0.00	0.02	1.23
Uttarakhand	0.30	0.27	0.00	0.02	0.59
Others	1.01	0.89	0.00	0.29	2.19
All India	69.19	13.89	2.59	3.77	89.43

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

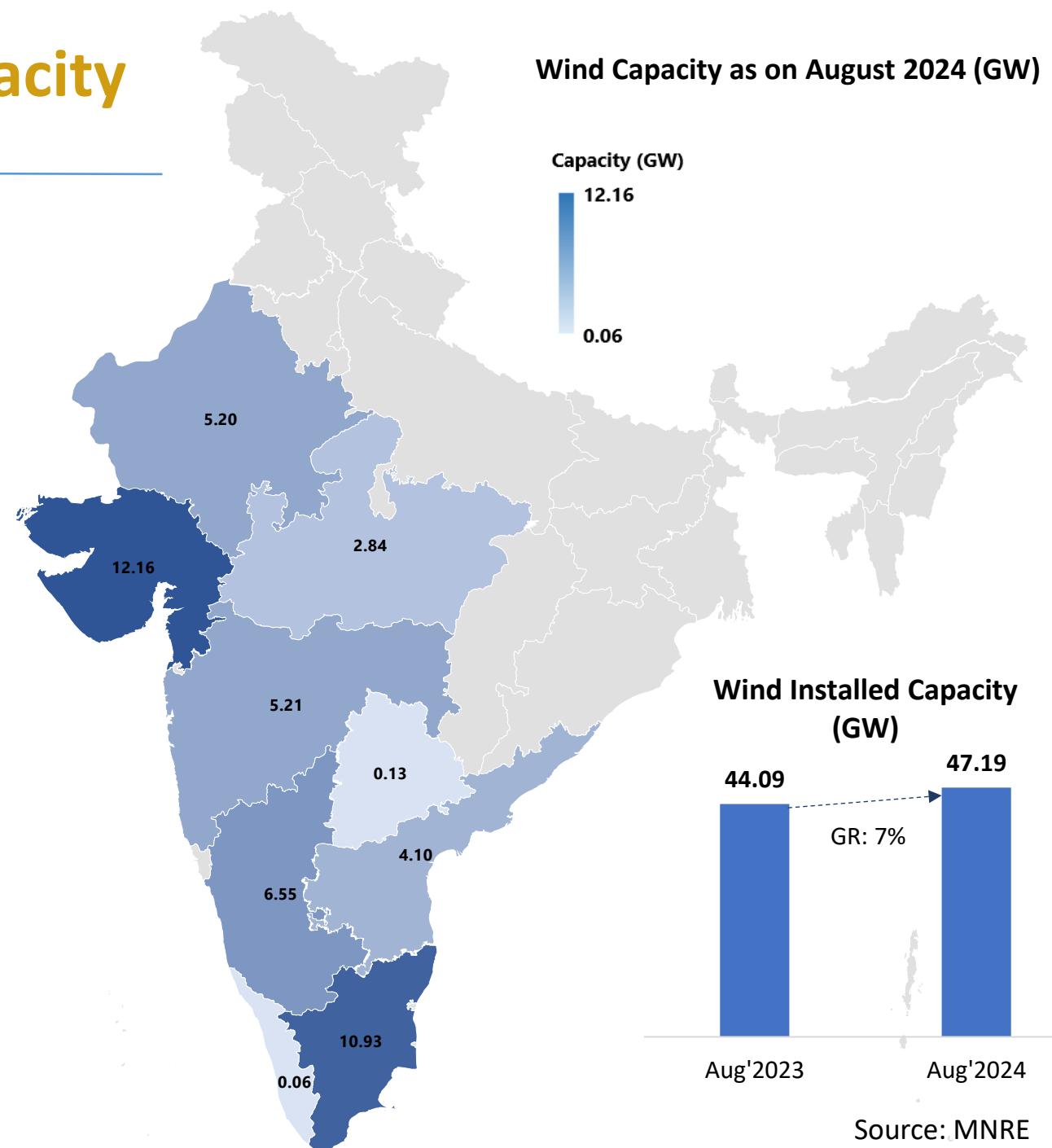
Solar Capacity as on August 2024 (GW)



State-wise Wind Onshore Capacity

as on August 2024

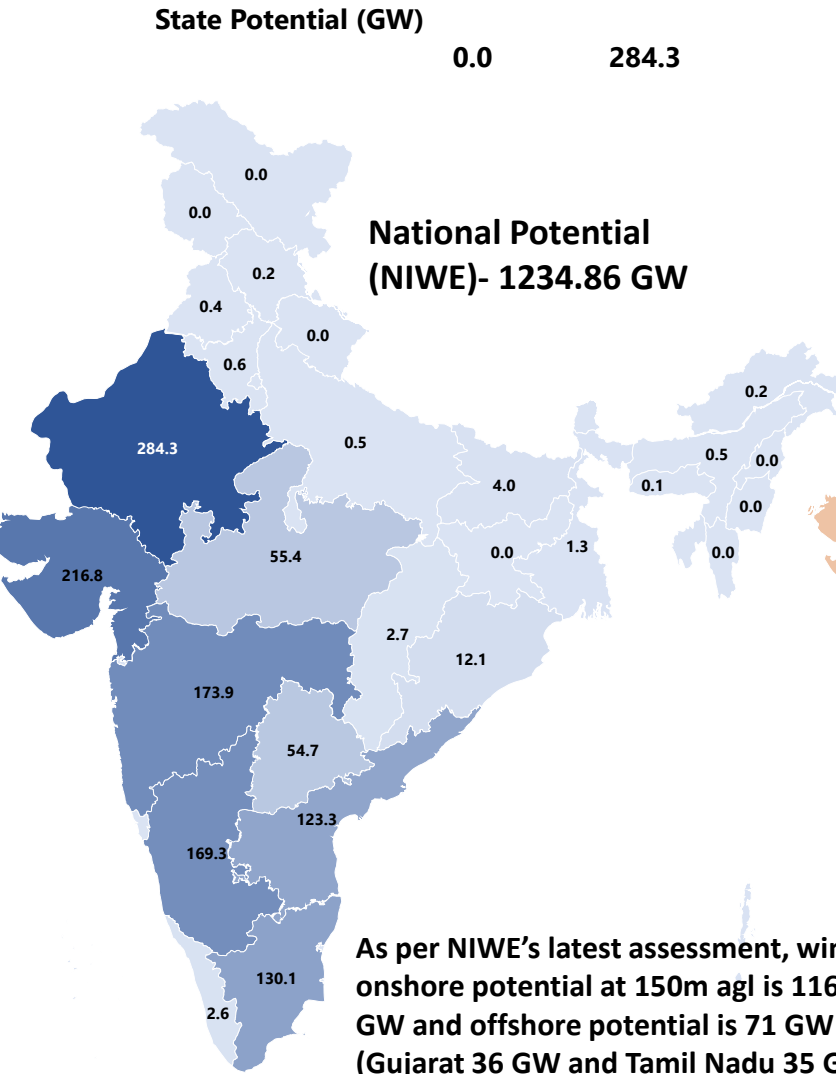
State-wise installed capacity of Wind (Onshore) Power	
States	Installed Capacity (GW)
Gujarat	12.16
Tamil Nadu	10.93
Karnataka	6.55
Maharashtra	5.21
Rajasthan	5.20
Andhra Pradesh	4.10
Madhya Pradesh	2.84
Telangana	0.13
Kerala	0.06
India Total	47.19



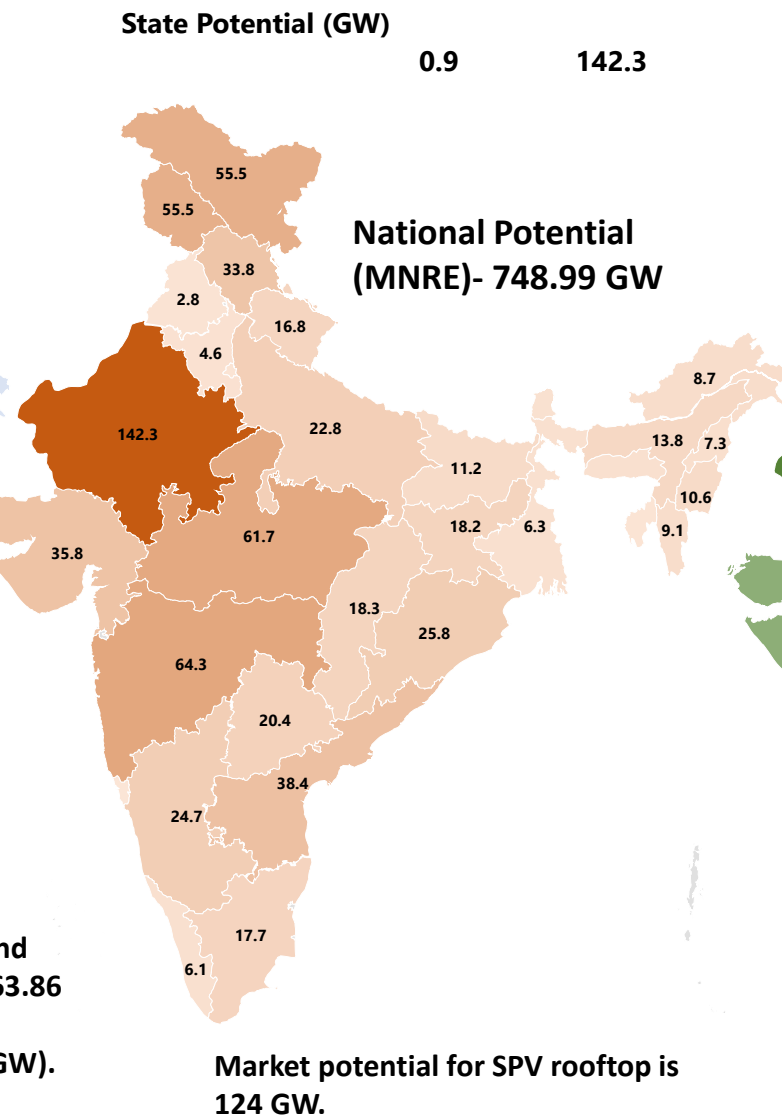
RE Potential and Installed Capacity (1/2)

RE potential in the state

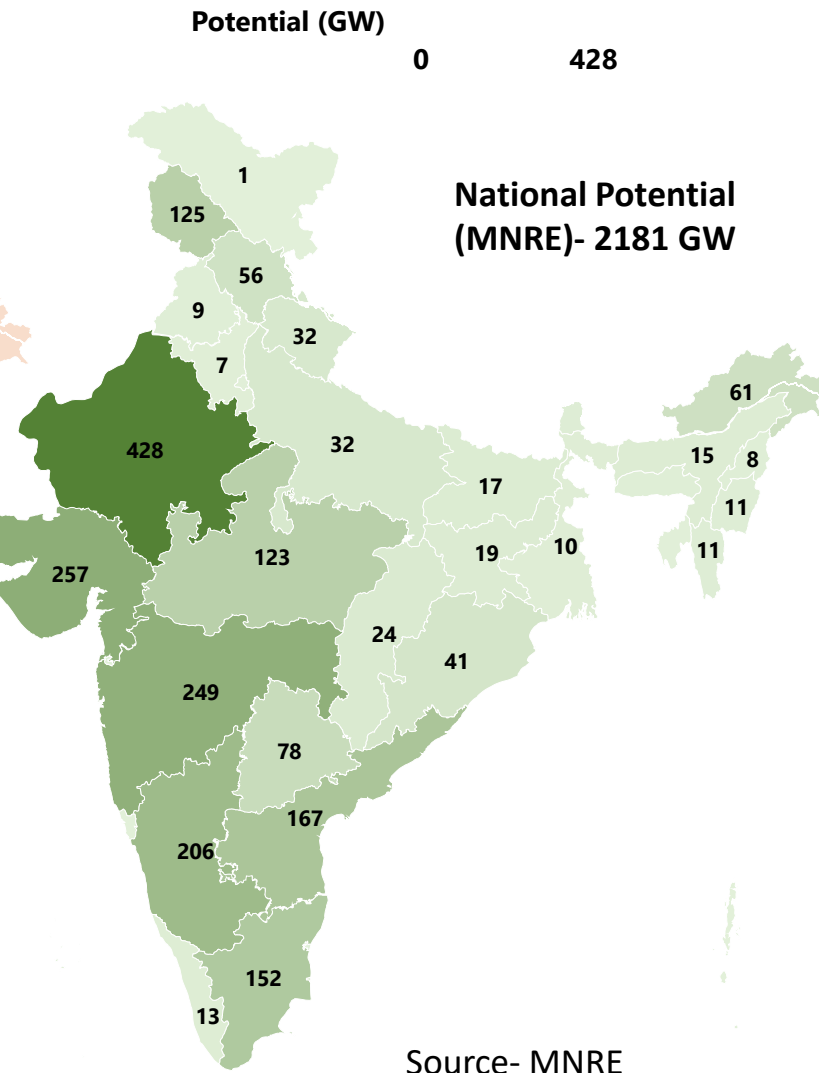
Wind Onshore (at 150m agl) and Offshore Potential



Solar Potential

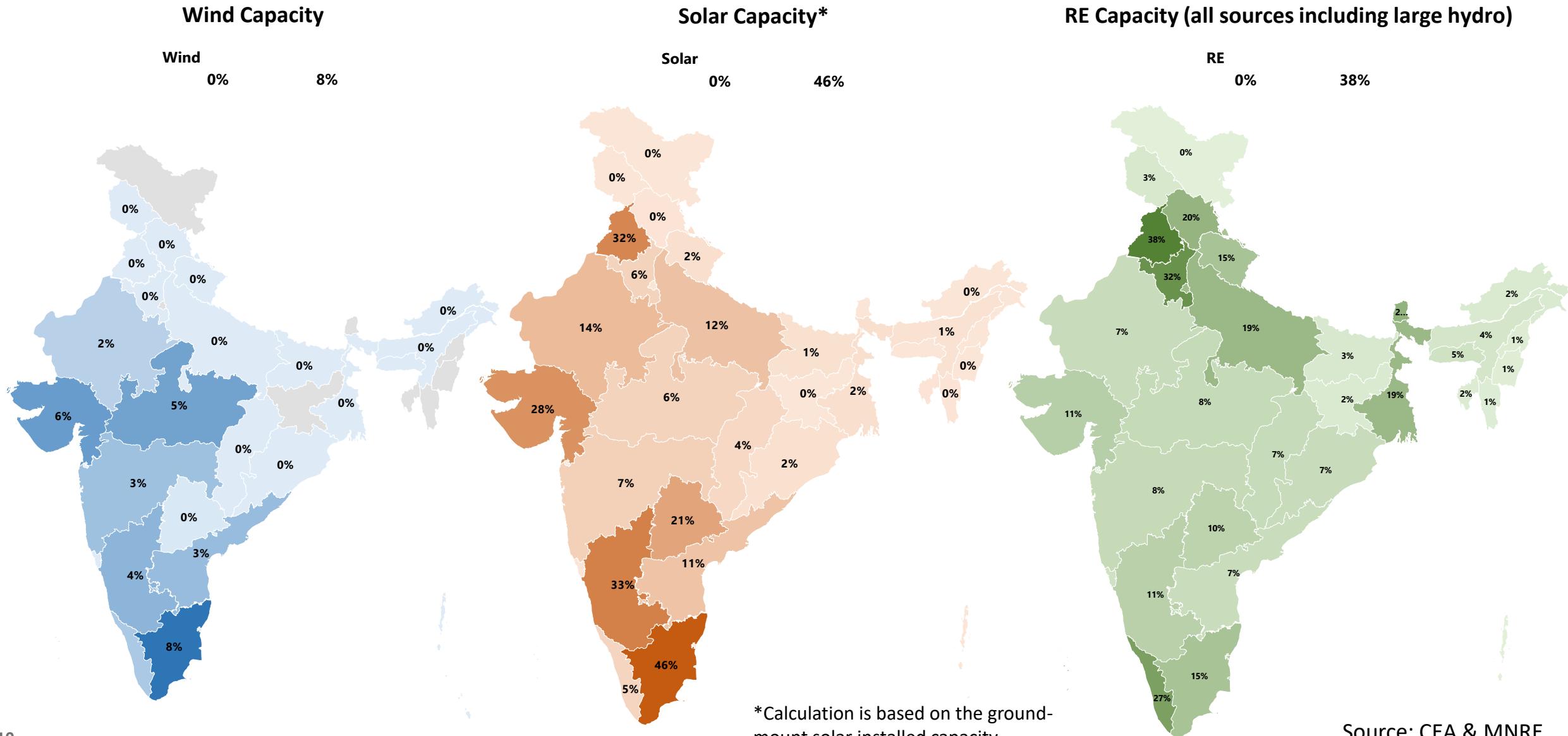


Renewable Energy Potential (all sources incl. large Hydro)



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

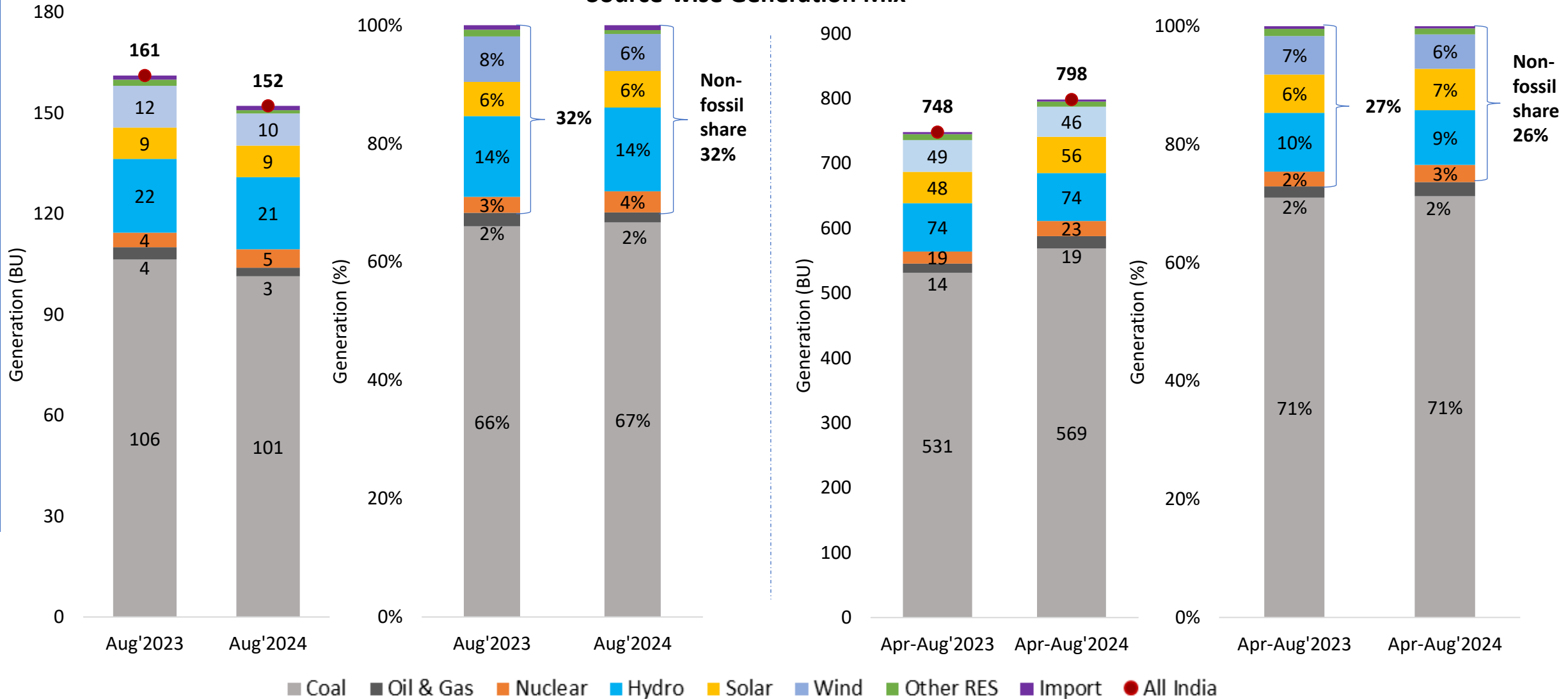
RE Installed capacity as a Percentage of the total resource potential in the state as on August 2024



Source: CEA & MNRE

India's Electricity Generation Mix

Source-wise Generation Mix

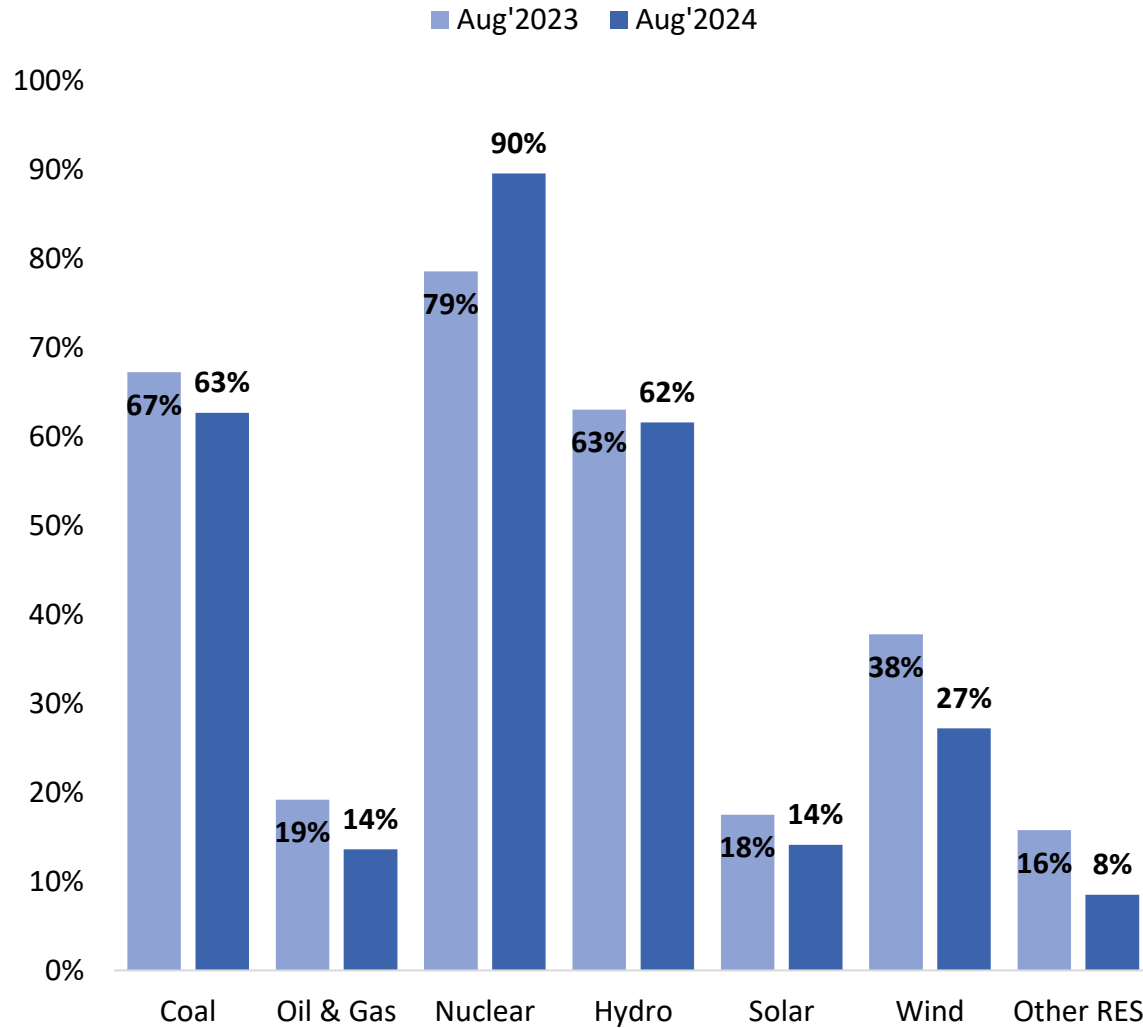


NOTE: The generation data for August'2024 is provisional.

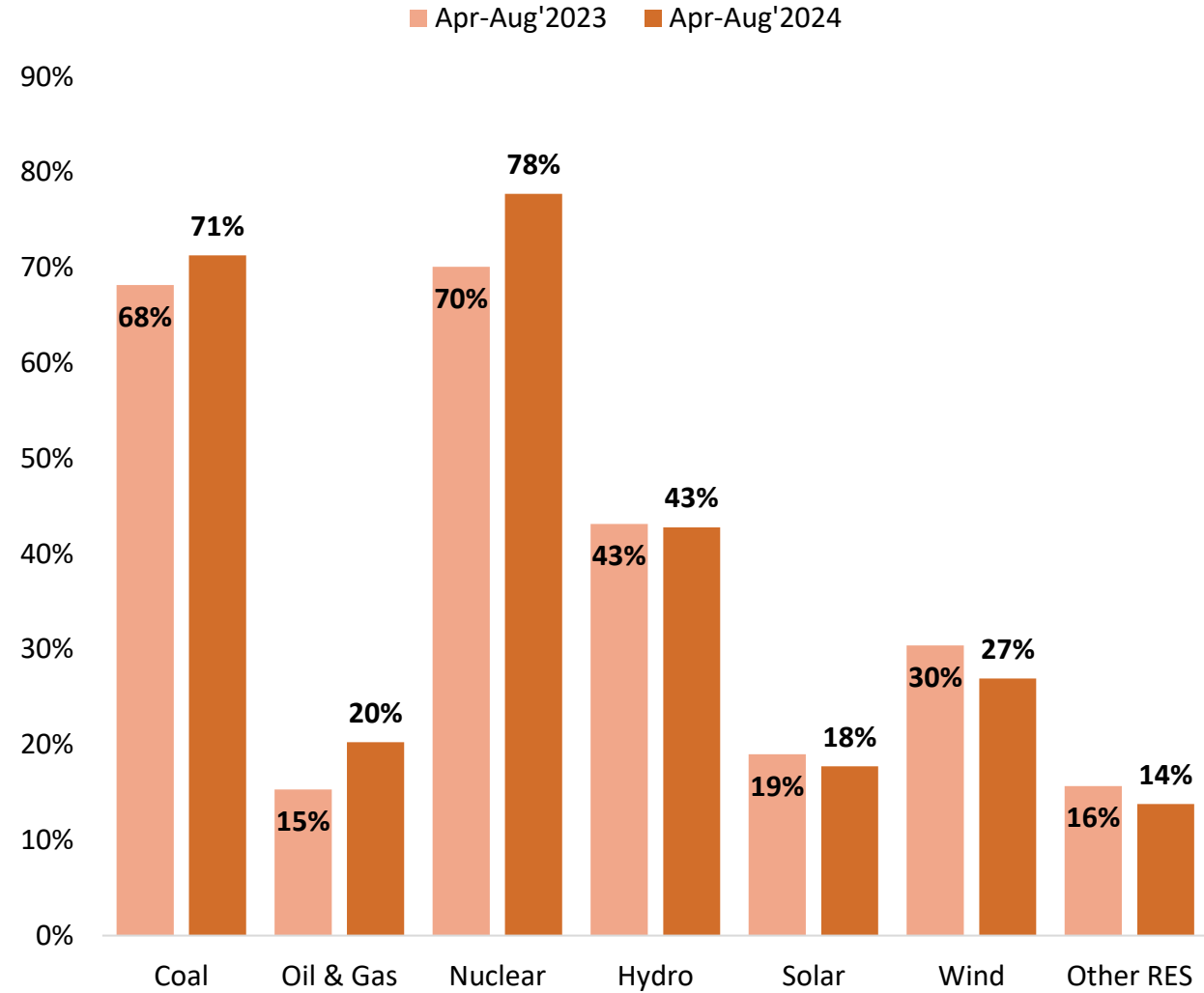
Source: CEA

Source-wise PLF/CUF

Source-wise PLF/ CUF in August (%)



Source-wise PLF/ CUF Comparison (%)

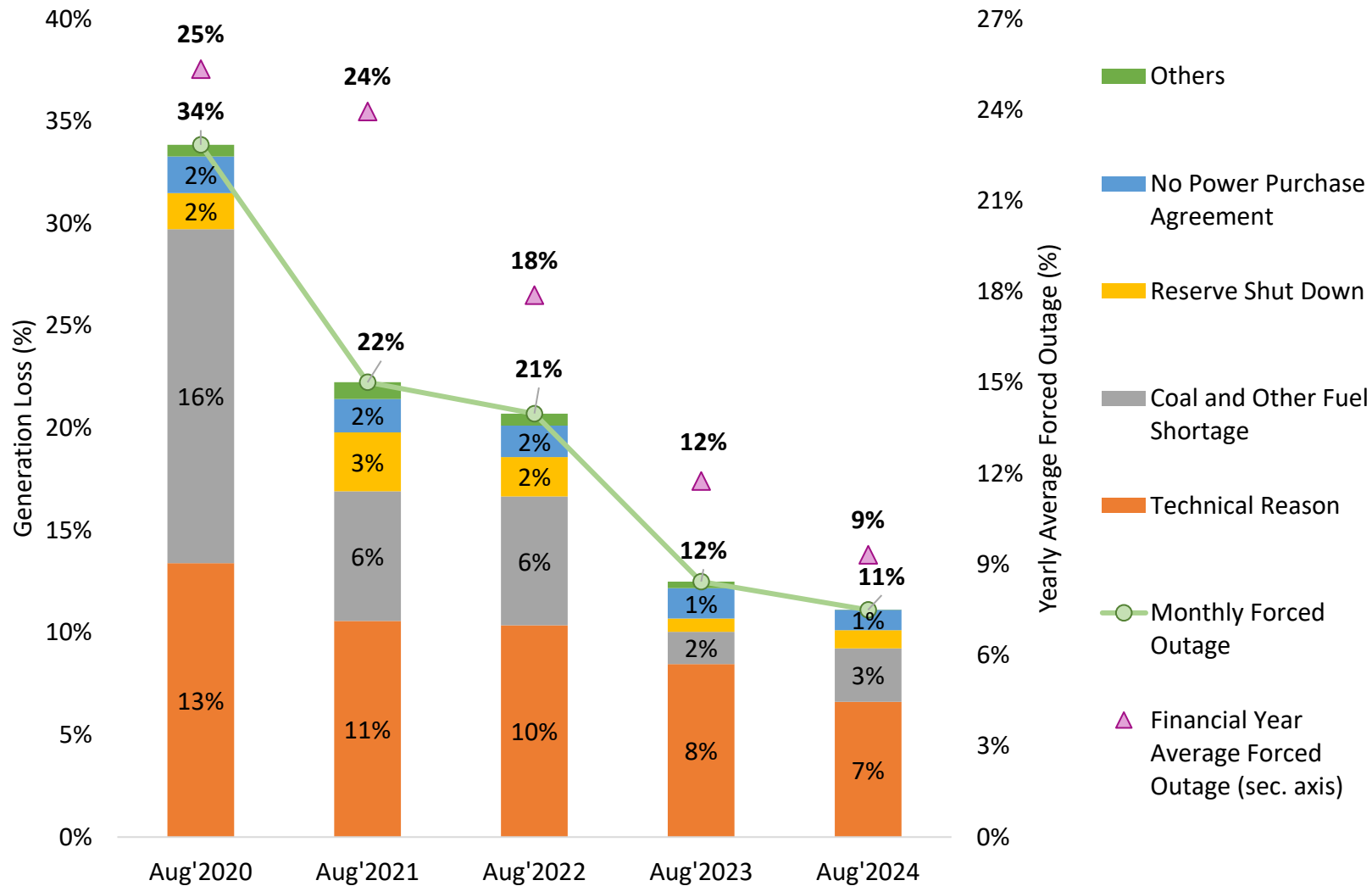


NOTE: The PLF/CUF data is based on provisional generation for August'2024.

Source: CEA & MNRE

Thermal Generation Loss and Reasons for Forced Outages

Forced Outages for August over the years



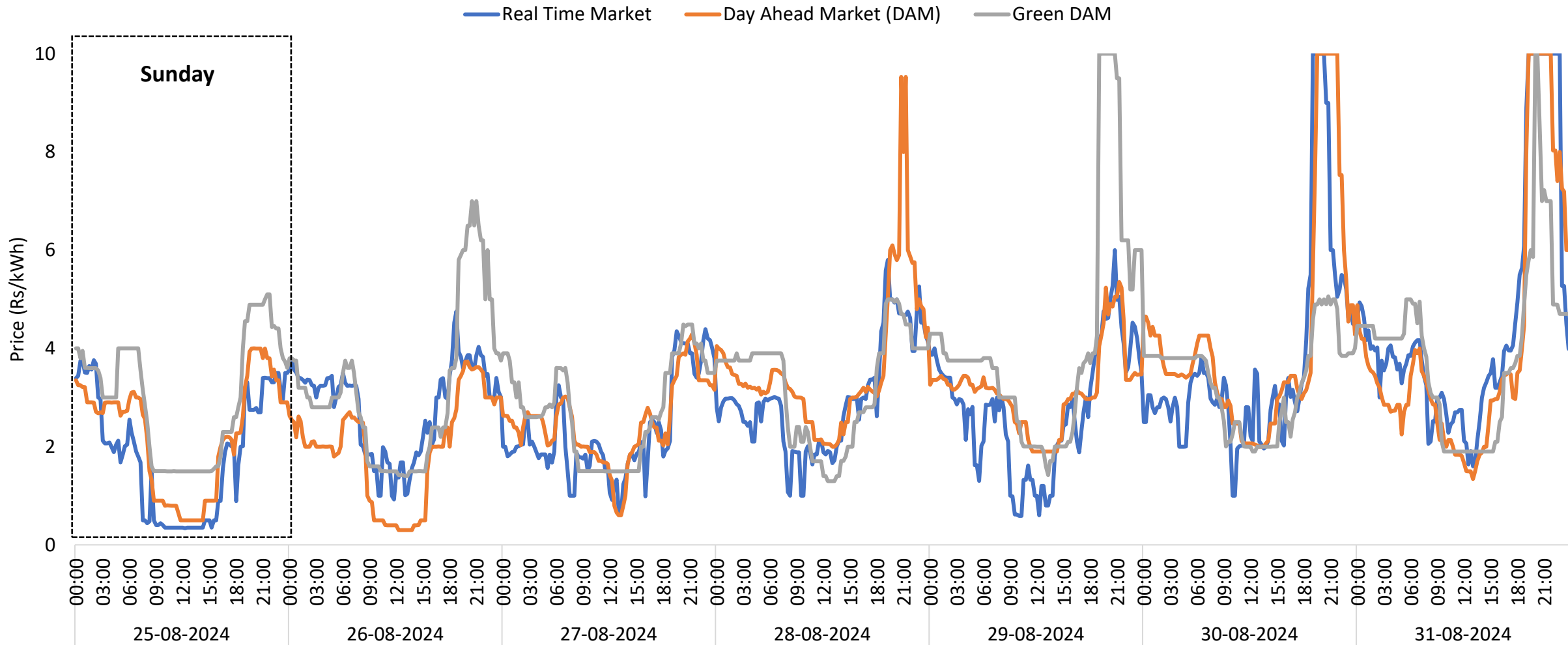
Year/ Month		Average Forced Outage Share
Yearly	FY 2022-23	18%
	FY 2023-24	12%
	FY 2024-25 (up to Aug'2024)	9%
Monthly	Aug'2022	21%
	Aug'2023	12%
	Aug'2024	11%

Thermal includes only Coal and Lignite Plants.

Source: ICED

Indian Electricity Exchange (IEX) Market Snapshot

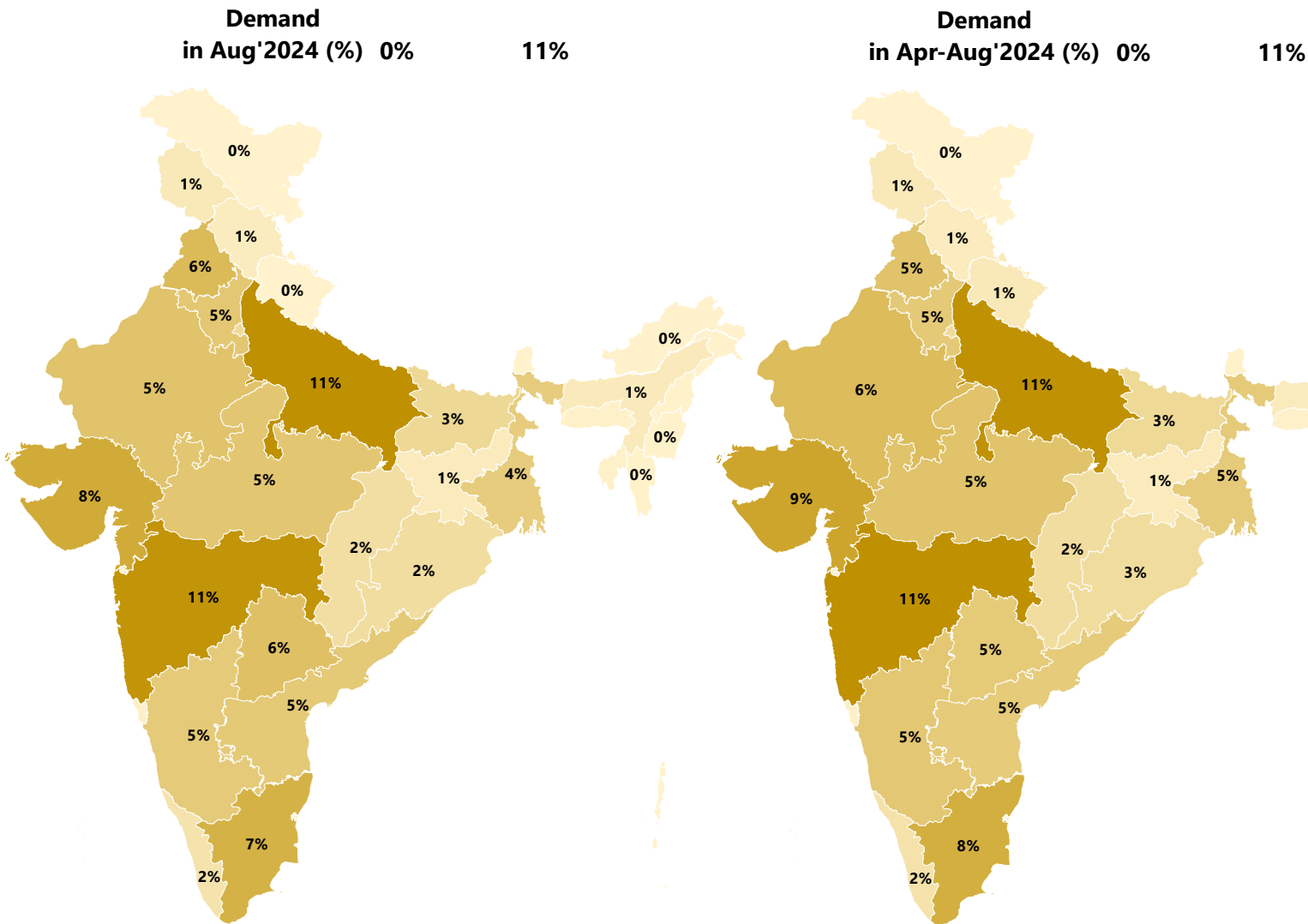
Market Clearing Prices of last 7 days of August 2024



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 (%)



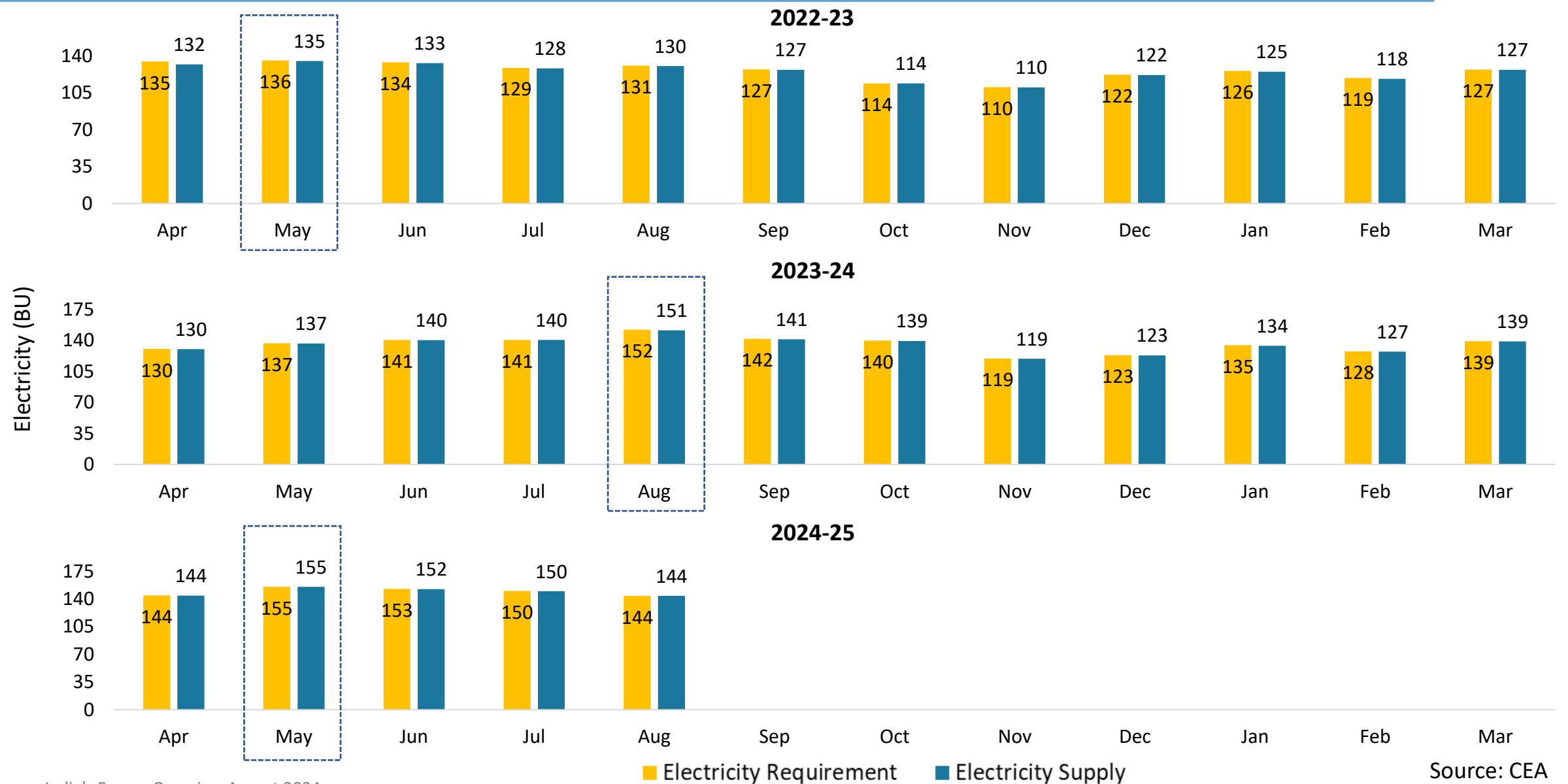
Month	Electricity Demand (BU)	Electricity Supply (BU)	Gap (BU) (+/-)
Aug'2022	131	130	0.5
Aug'2023	152	151	0.9
Aug'2024	144	144	0.1

Apr-Aug	Electricity Demand (BU)	Electricity Supply (BU)	Gap (BU) (+/-)
FY 2022-23	664	659	5
FY 2023-24	701	699	2
FY 2024-25	746	745	1

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

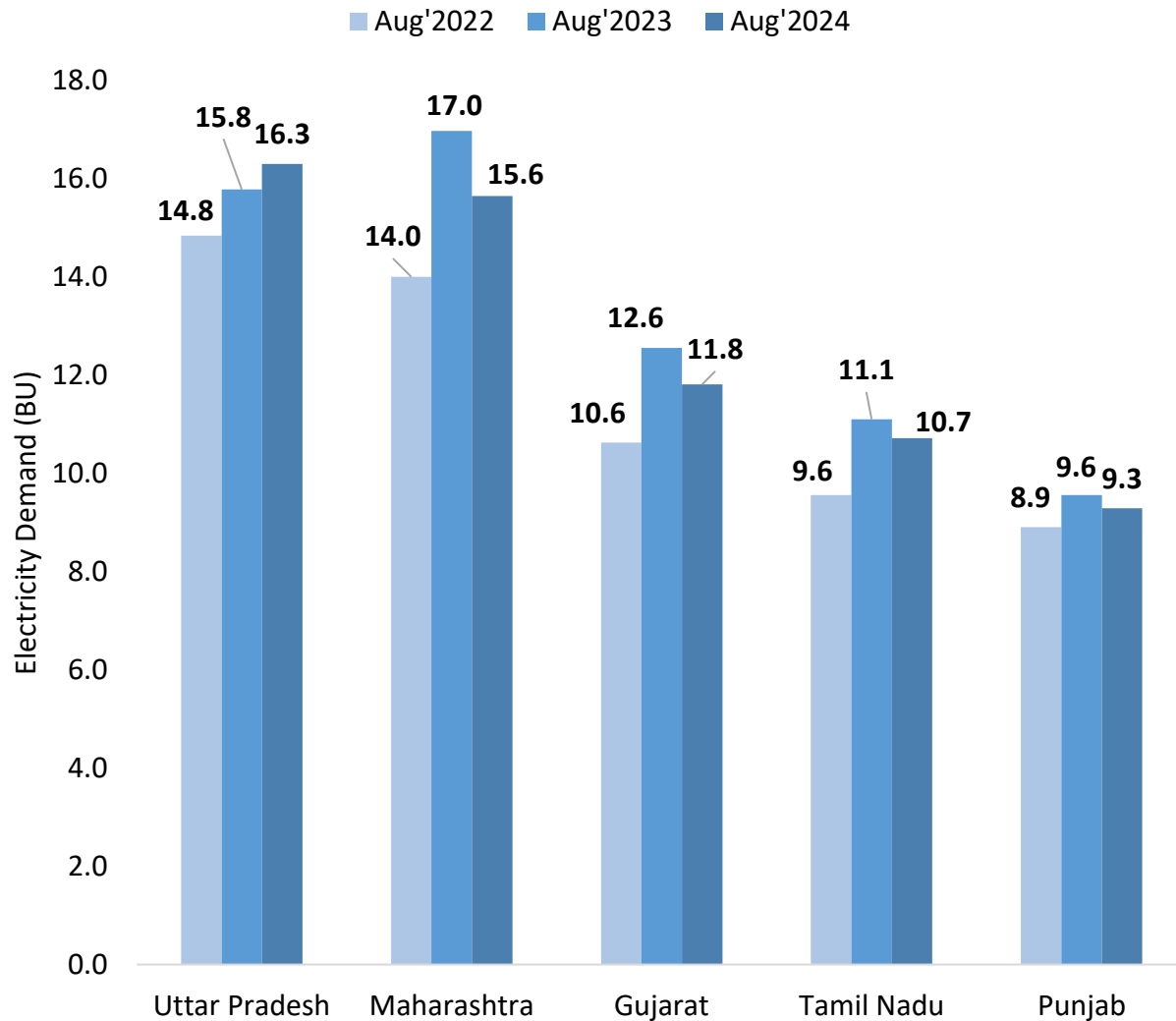
Source: CEA

India's Monthly Electricity Requirement and Supply

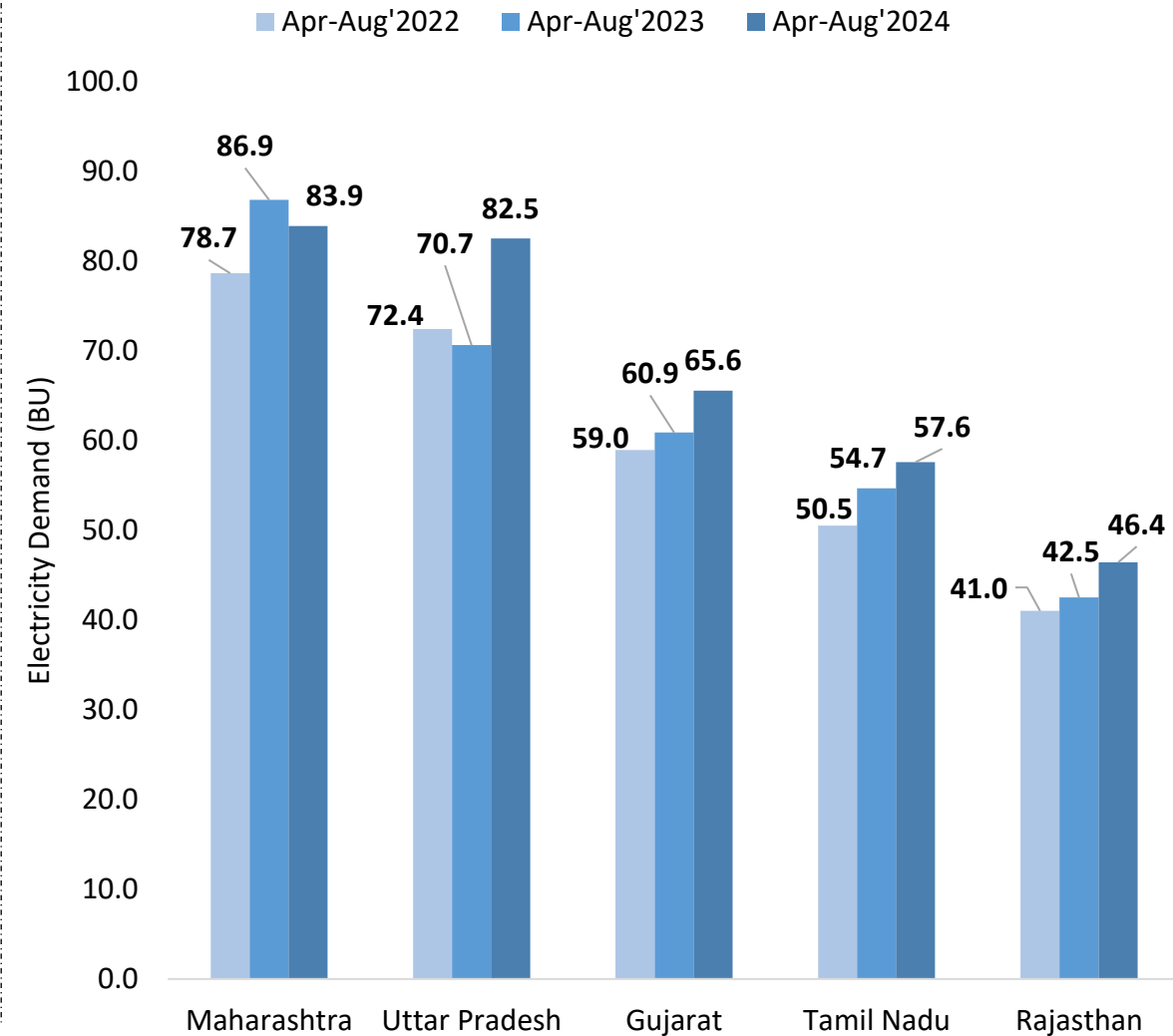


Monthly Electricity Demand of the top 5 states

States with Highest Electricity Demand in August (BU)



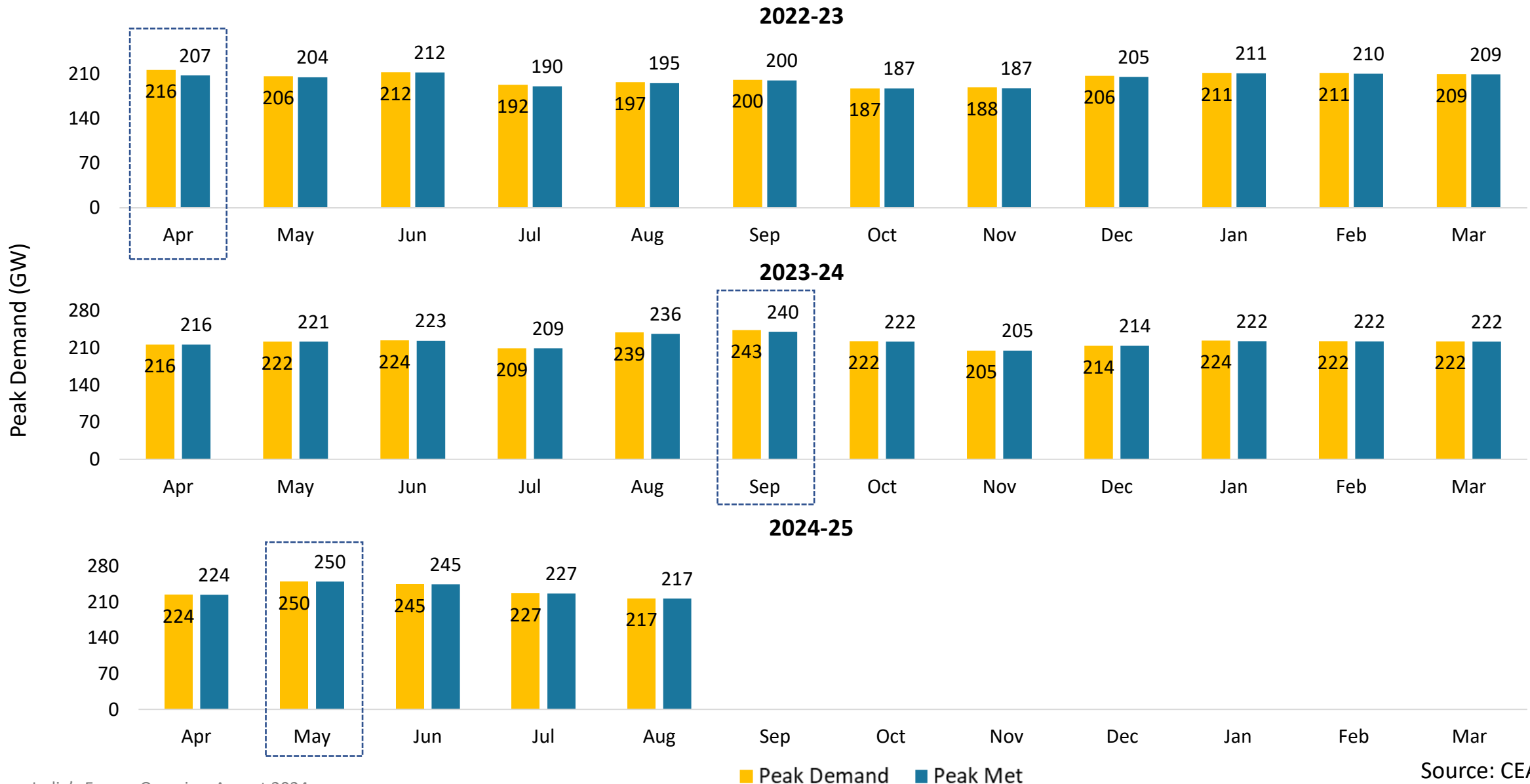
States with Highest Electricity Demand (BU)



Note: The electricity demand data for August'24 is Provisional.

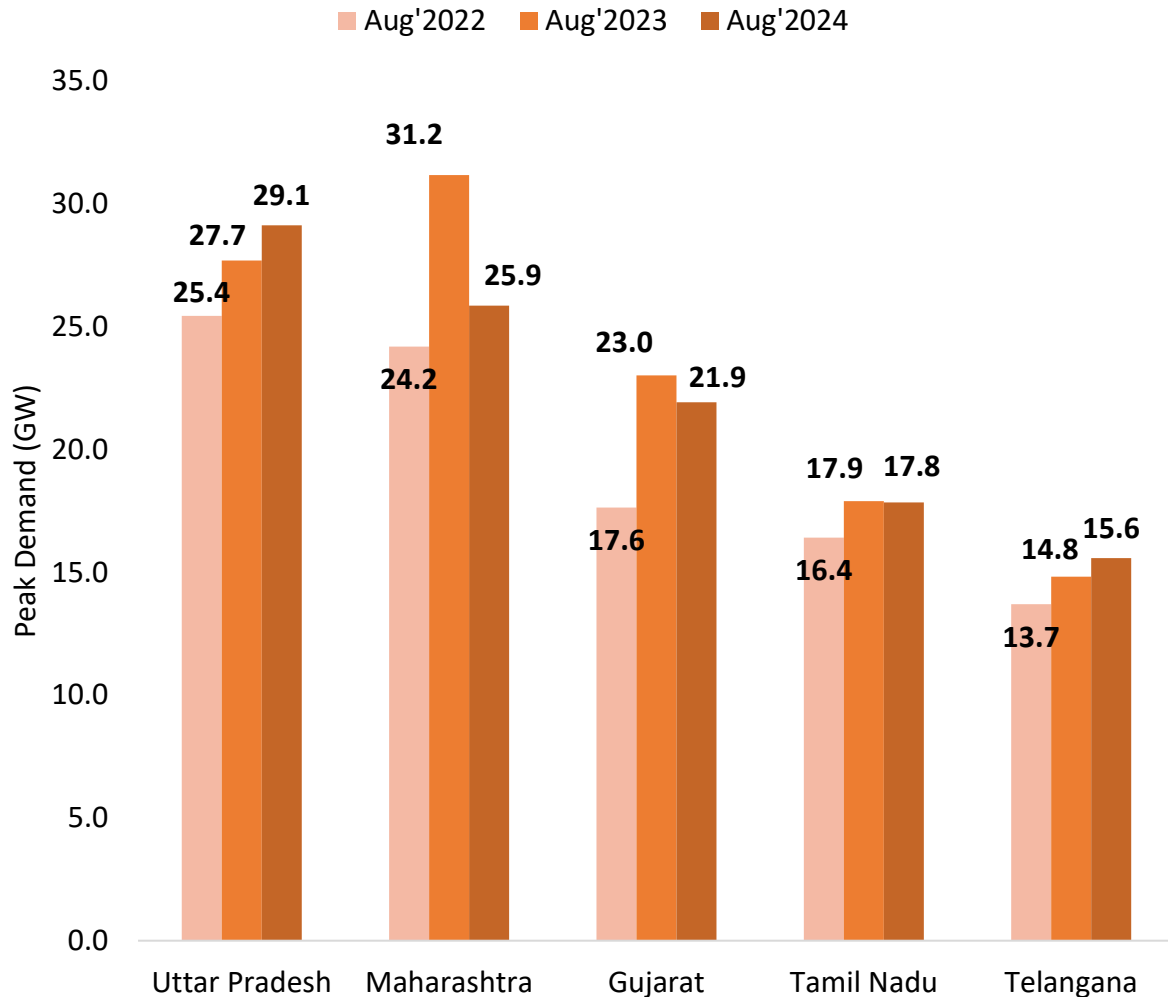
Source: CEA

India's Monthly Peak Electricity Demand and Supply

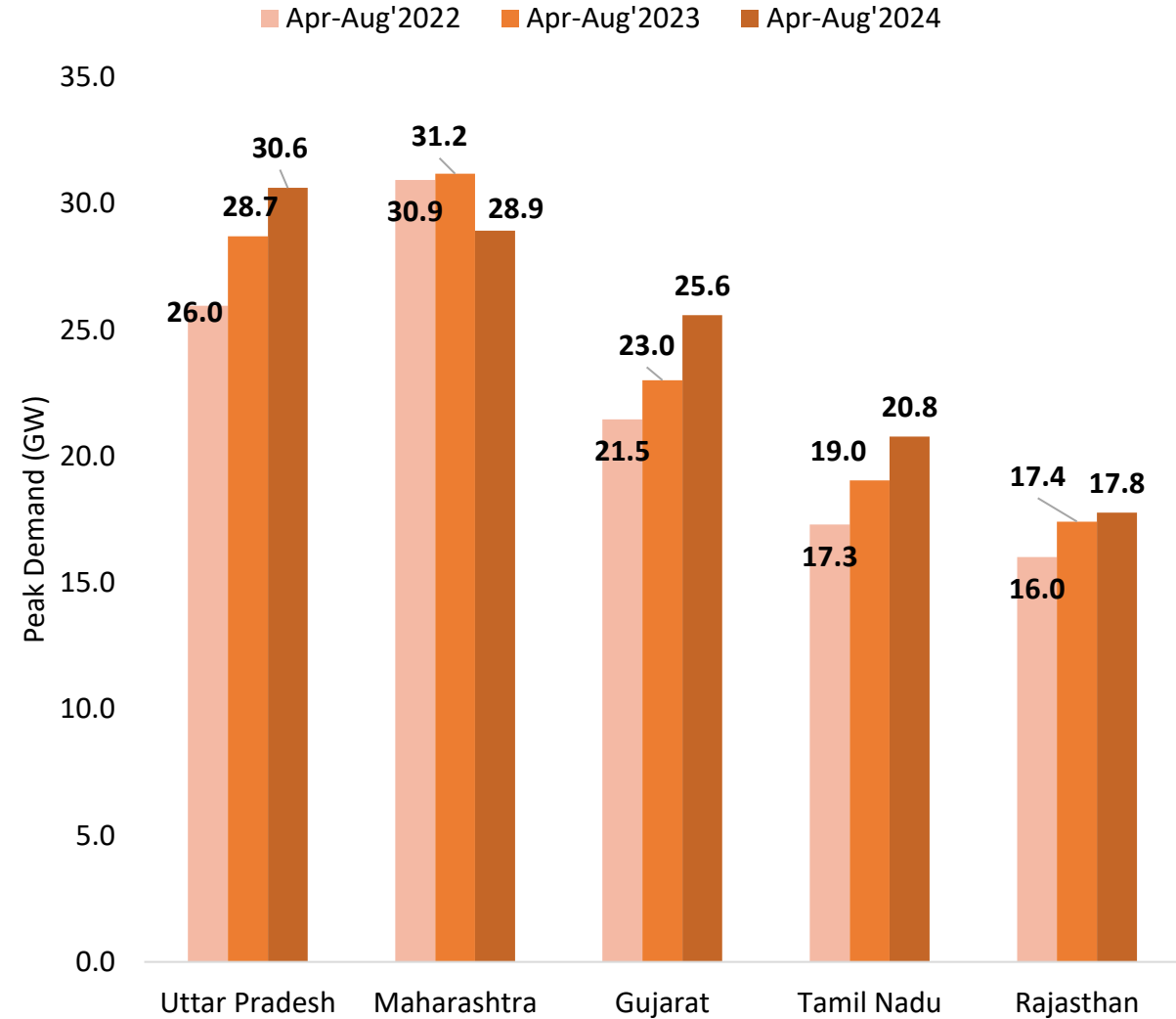


Monthly Peak Electricity Demand of the top 5 states

States with Highest Peak Electricity Demand in August (GW)



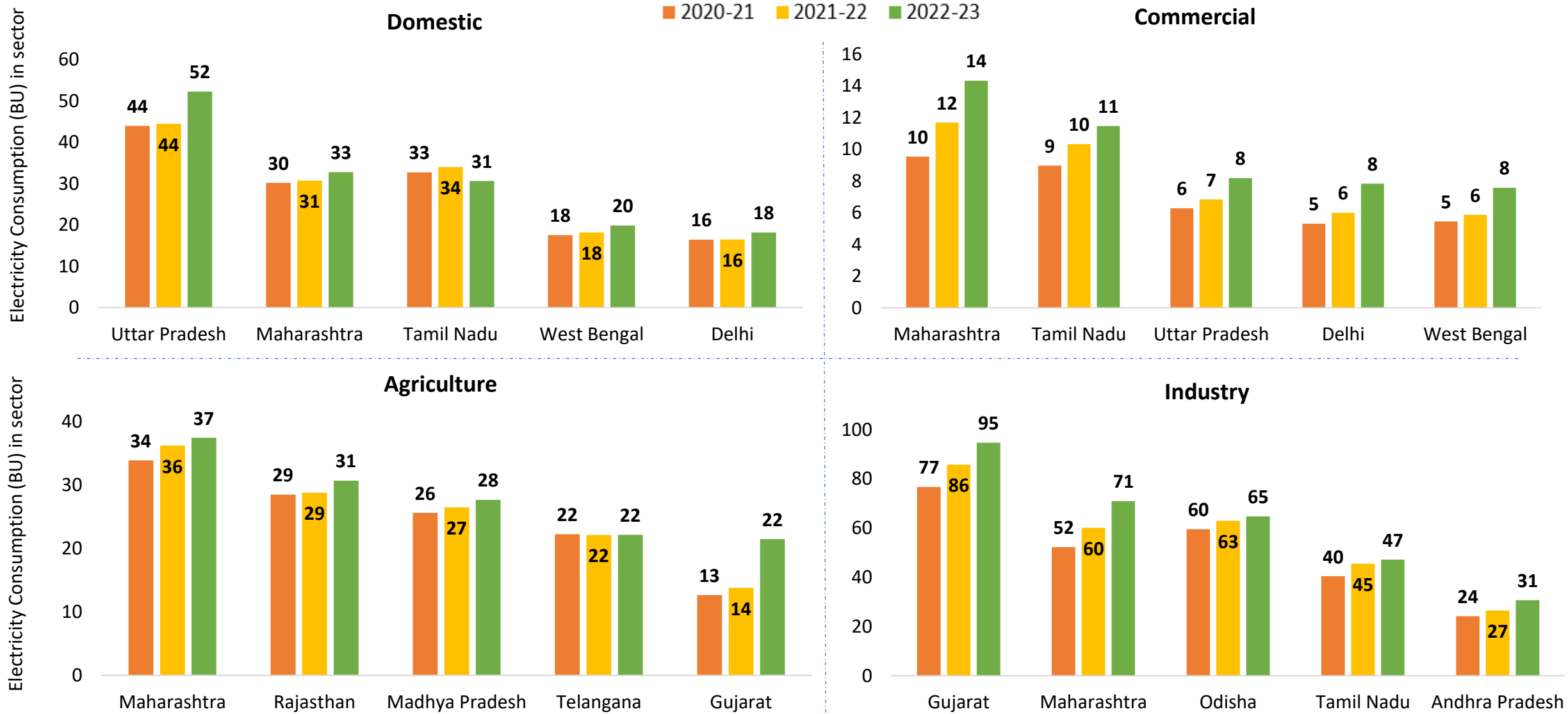
States with Highest Peak Electricity Demand (GW)



Note: The peak electricity demand data for August'24 is Provisional.

Source: CEA

Electricity Consumer-category wise top 5 States

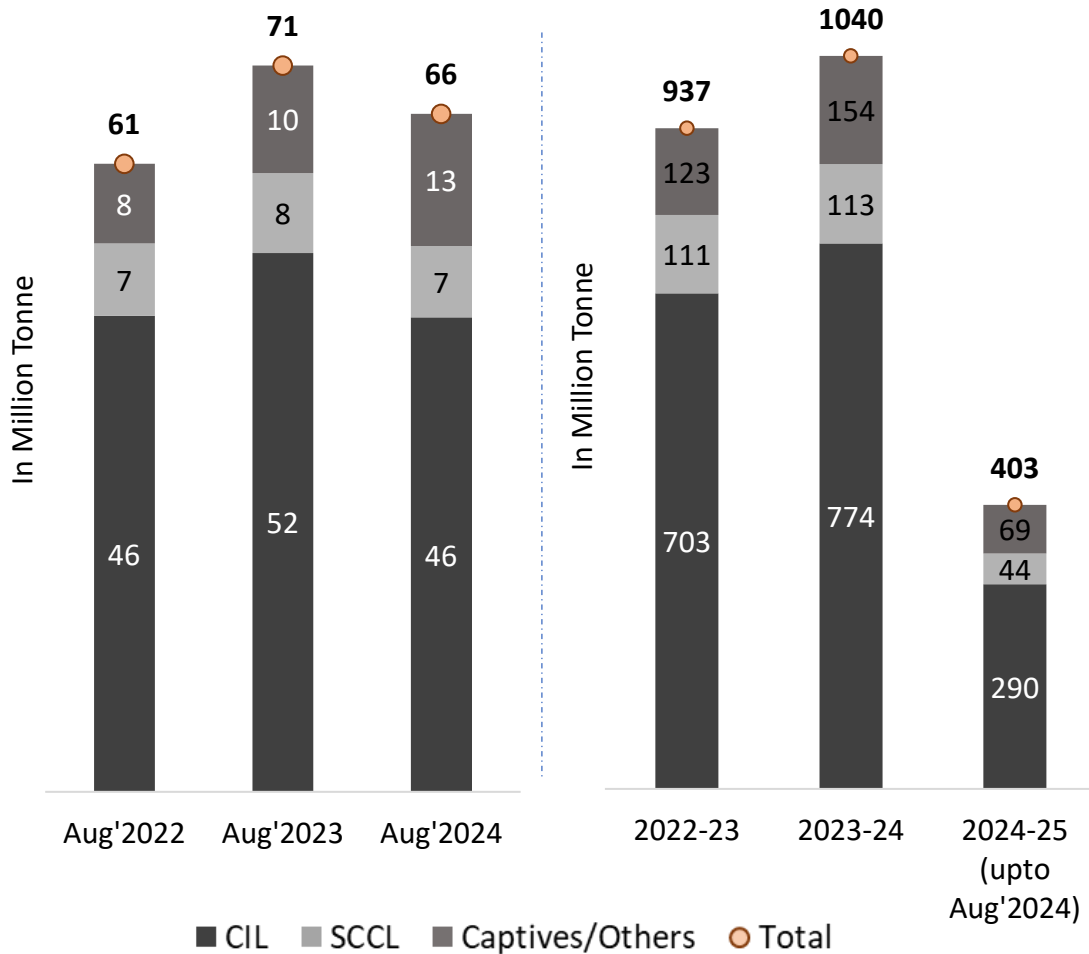


NOTE: Top 5 States under consumer-categories are selected on the basis of 2022-23

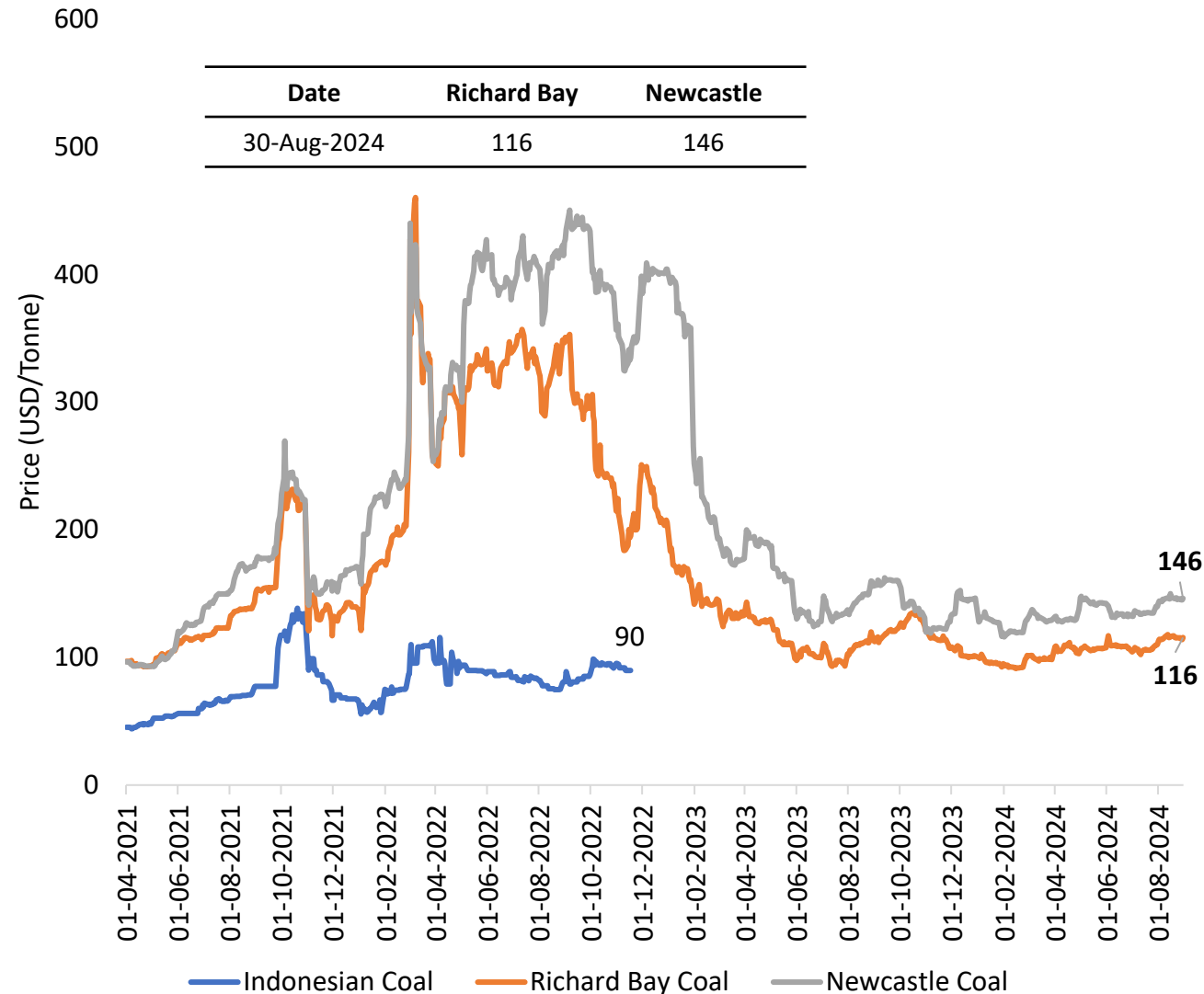
Source: CEA

Monthly Coal Statistics

Monthly/ Annual Coal (incl. Lignite) Production (in Million Tonnes)

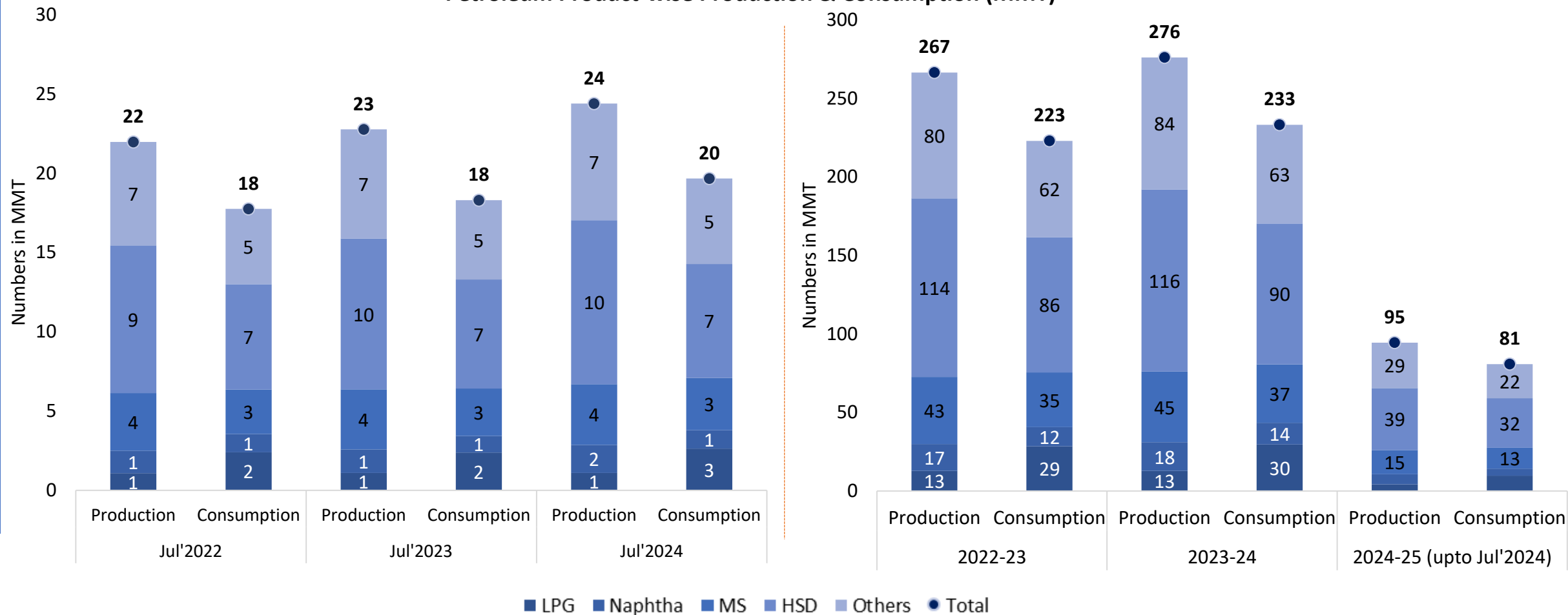


International Coal Prices



Petroleum Products Market Scenario (1/3)

Petroleum Product-wise Production & Consumption (MMT)



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

Petroleum Products Market Scenario (2/3)

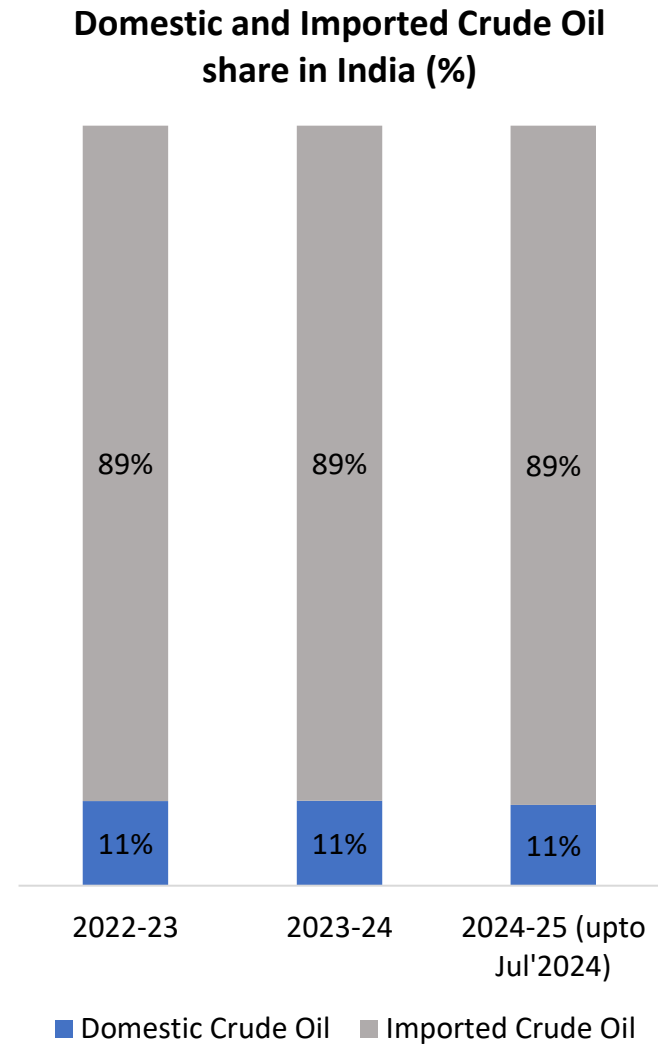
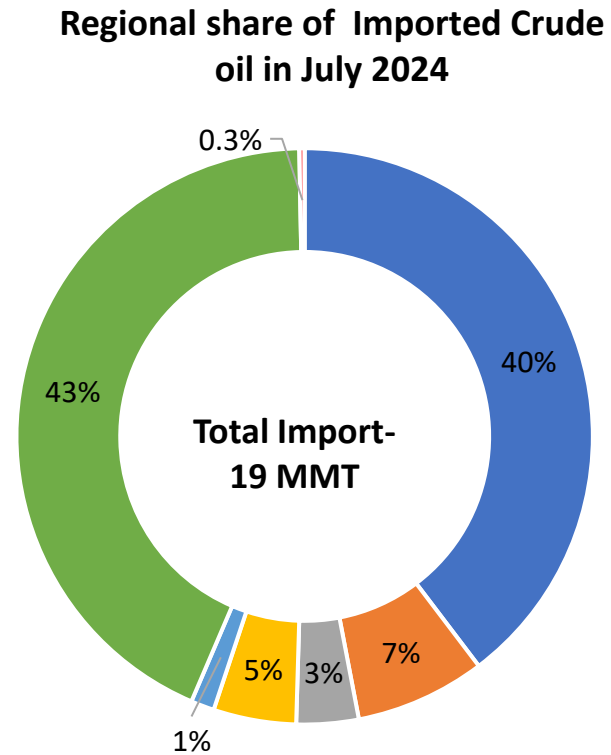
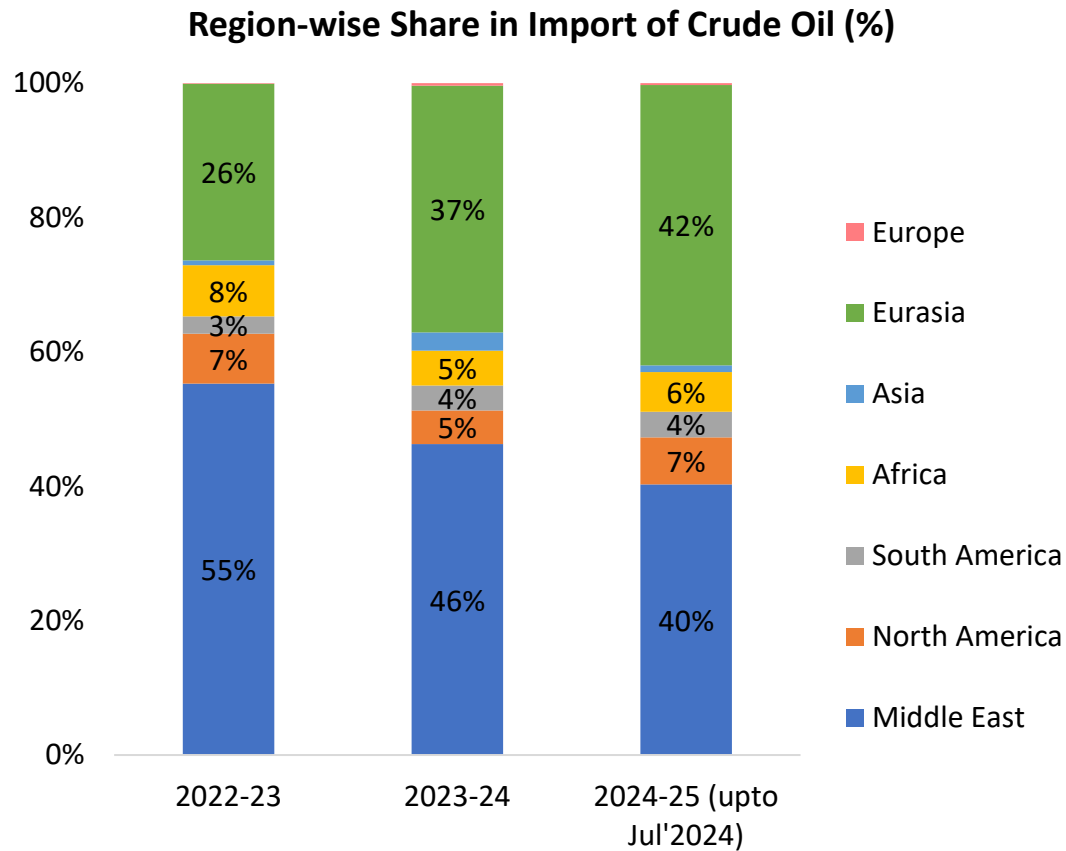
Import/Export of Crude Oil and Petroleum Products ('000 Tonnes)							
Petroleum Products	Import/ Export	Monthly			Yearly		
		Jul'22	Jul'23	Jul'24	2022-23	2023-24	2024-25 (upto Jul'2024)
Crude Oil	Import	20624	19508	19362	232700	233118	81647
	Export	0	0	0	0	0	0
	Net Import	20624	19508	19362	232700	233118	81647
LPG	Import	1417	1363	1805	18335	18475	6385
	Export	42	41	45	540	525	178
	Net Import	1376	1322	1761	17796	17950	6207
Diesel	Import	139	1	4	322	42	17
	Export	2146	2384	2082	28494	28193	8165
	Net Import	-2008	-2383	-2078	-28172	-28150	-8147
Petrol	Import	63	0	54	1069	717	171
	Export	1074	1258	1065	13127	13461	4760
	Net Import	-1011	-1258	-1011	-12058	-12743	-4589
Others	Import	2113	2405	2488	24871	29433	10146
	Export	1350	1674	1933	18854	20258	7021
	Net Import	763	732	555	6017	9176	3124

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

NOTE: The data is available latest up to Jul'2024

Source: PPAC

Petroleum Products Market Scenario (3/3)



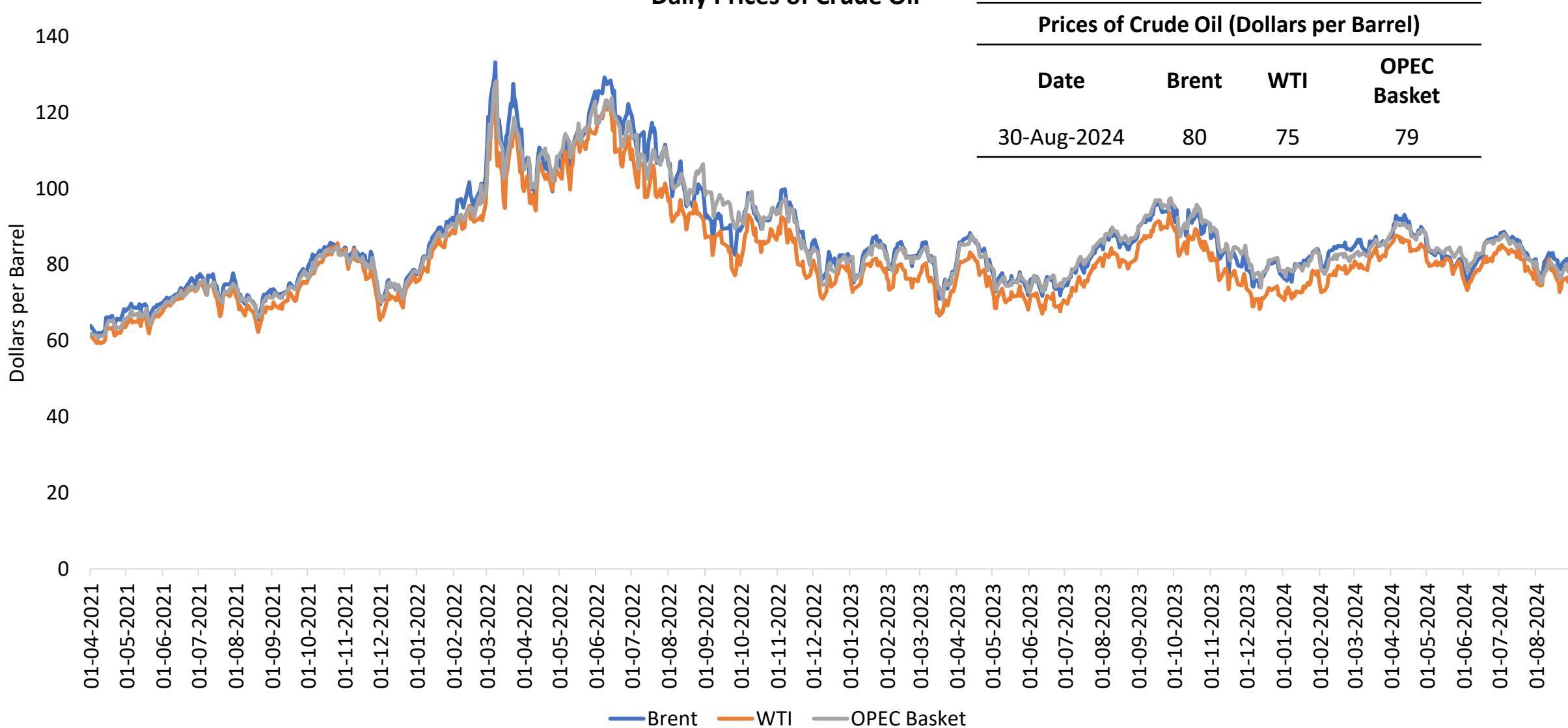
Total Import of Crude Oil (MMT)			
Total Import	2022-23	2023-24	2024-25 (up to Jul'2024)
Crude Oil	233	233	82

NOTE: The data is available latest up to Jul'2024

Source: MoPNG and PPAC

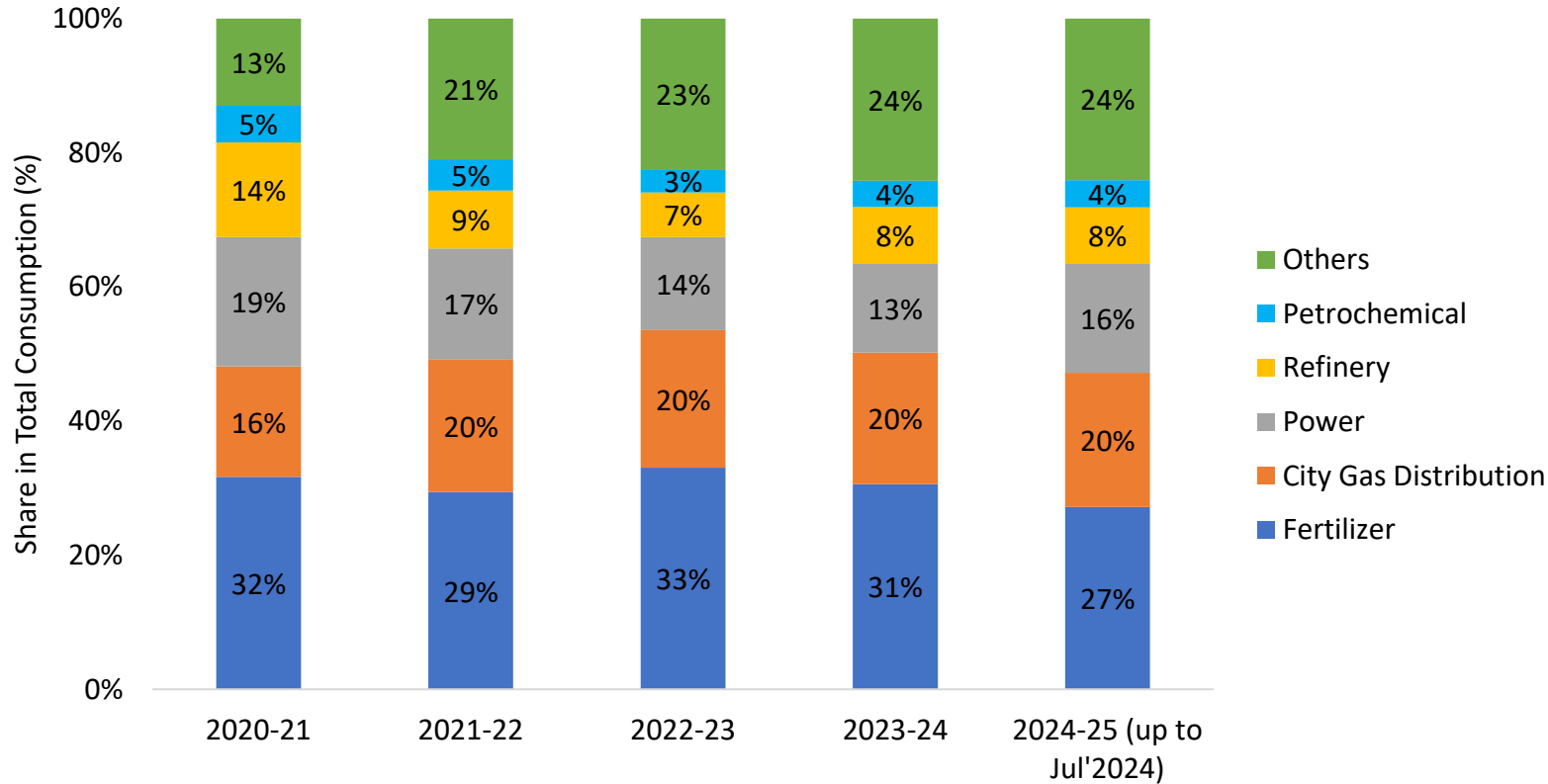
Daily Prices of Crude Oil

Daily Prices of Crude Oil

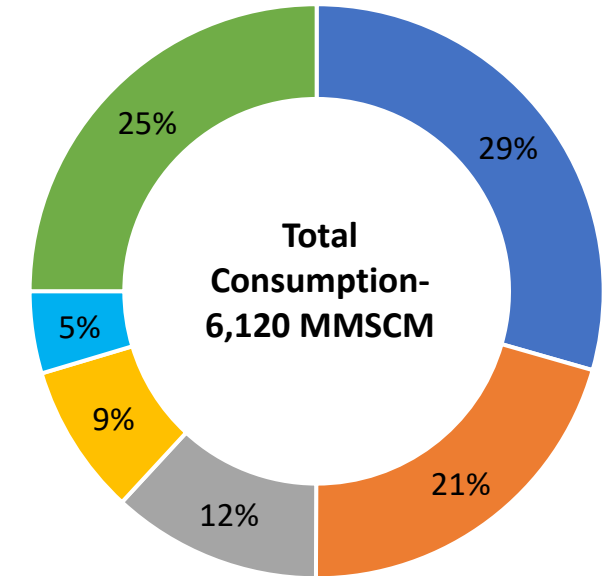


Gas Market Scenario (1/2)

Sector-wise Share in Natural Gas Consumption



Sector-wise share in Natural Gas Consumption in July 2024



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

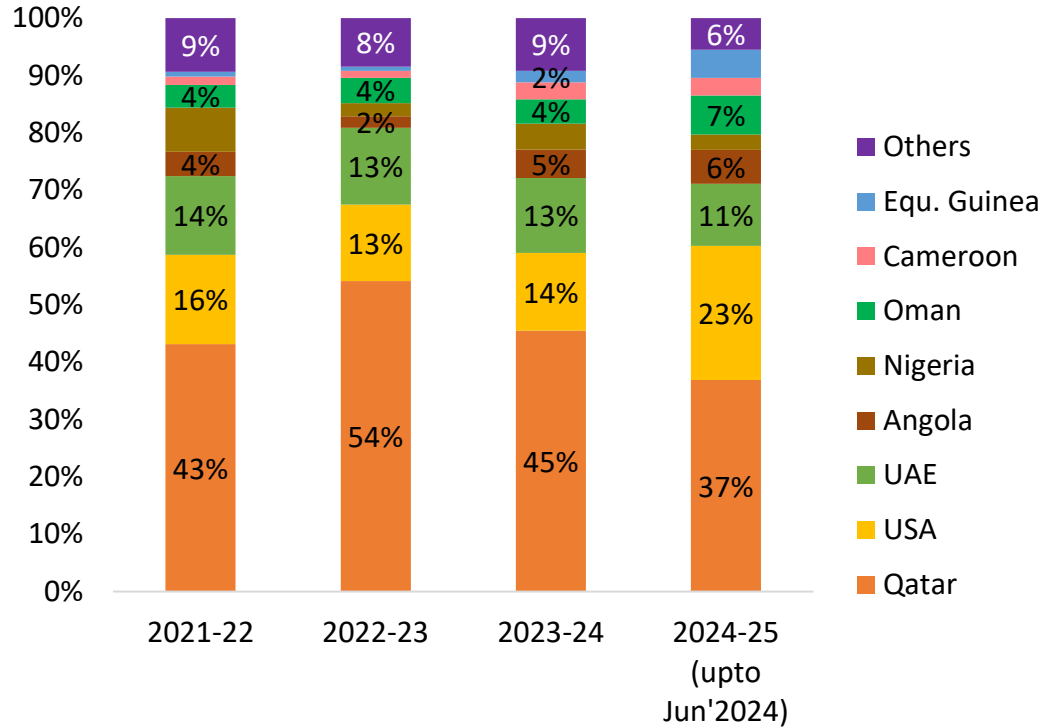
Total Consumption of Natural Gas (NG) (MMSCM)					
Total Consumption	2020-21	2021-22	2022-23	2023-24	2024-25 (up to Jul'2024)
NG	56,116	61,491	58,702	68,759	24,893

NOTE: The data is available latest up to Jul'2024

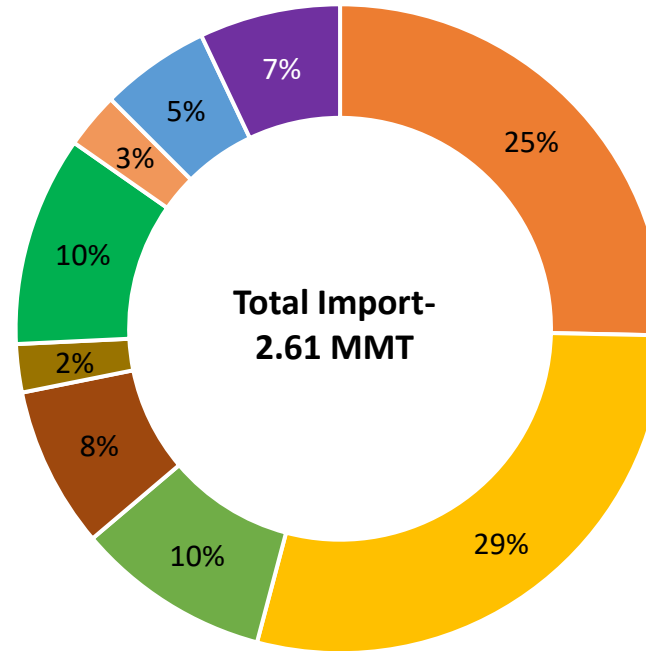
Source: PPAC

Gas Market Scenario (2/2)

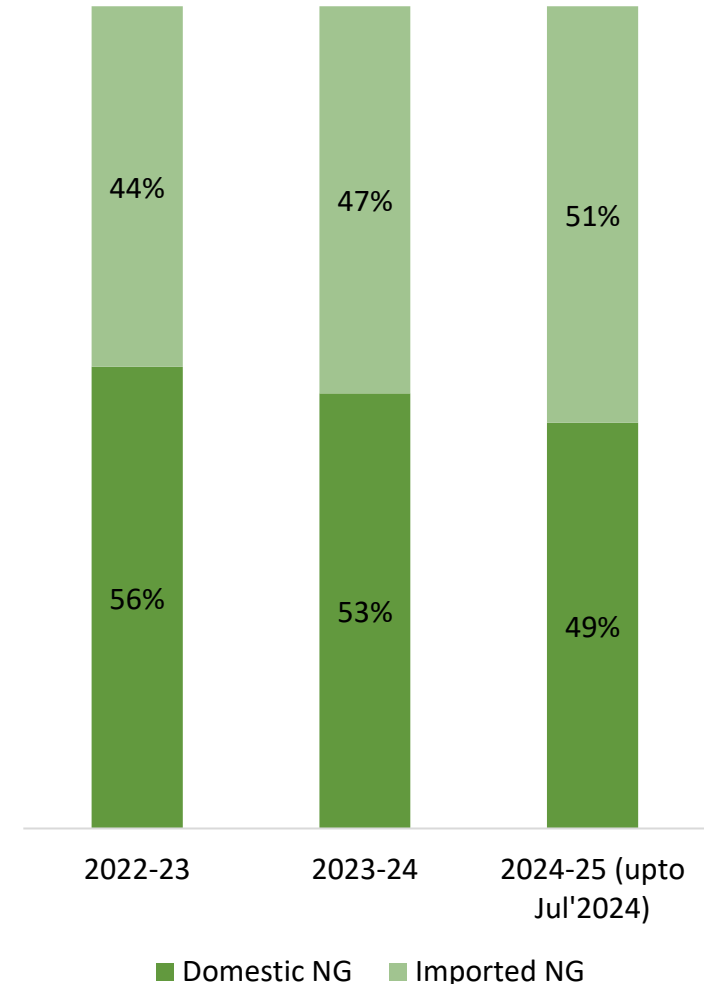
Region-wise Share in Import of LNG (%)



Country Share of Imported LNG in June'2024



Domestic and Imported Natural Gas share in India (%)



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

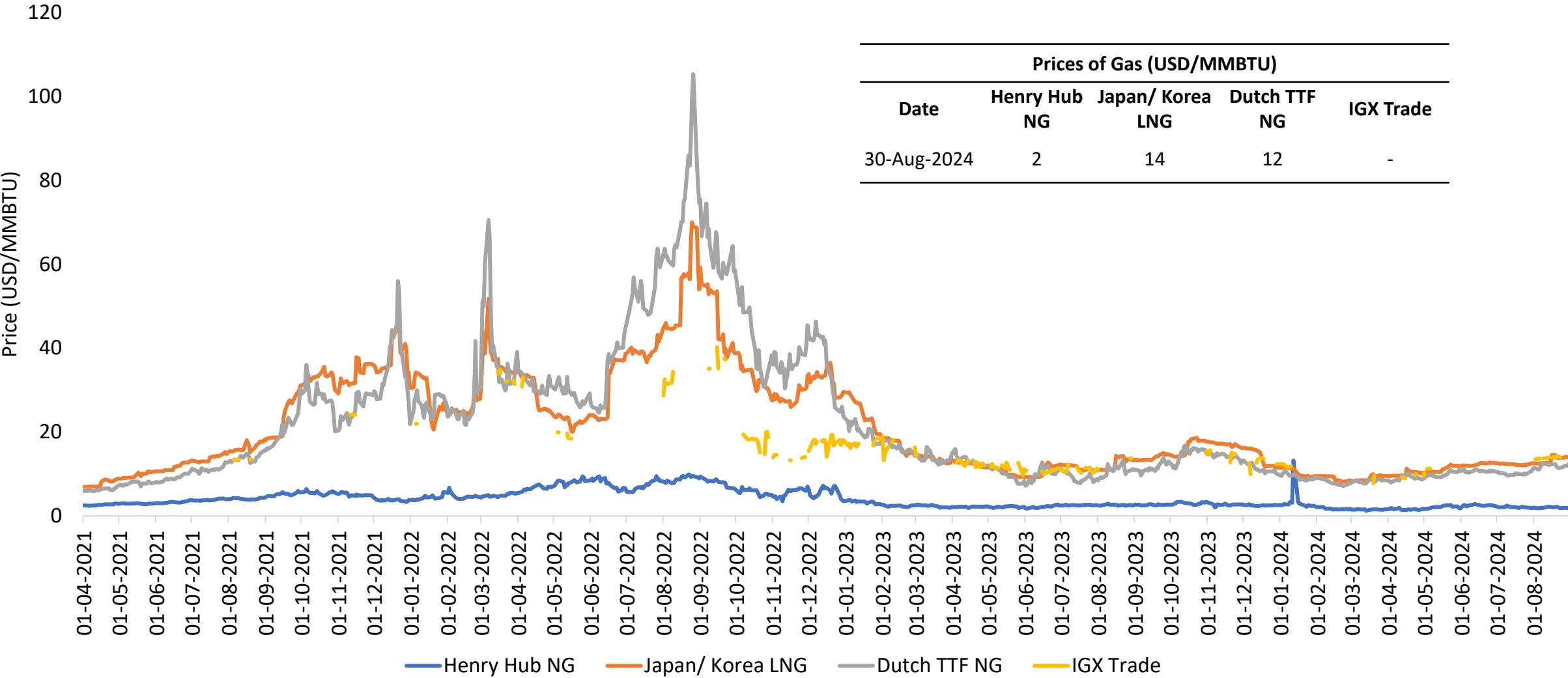
Total Import of Liquefied Natural Gas (LNG) (MMT)			
Total Import	2022-23	2023-24	2024-25 (up to Jul'2024)
LNG	19.85	24.00	9.26

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

Source: MoCI and PPAC

Daily Prices of Gas

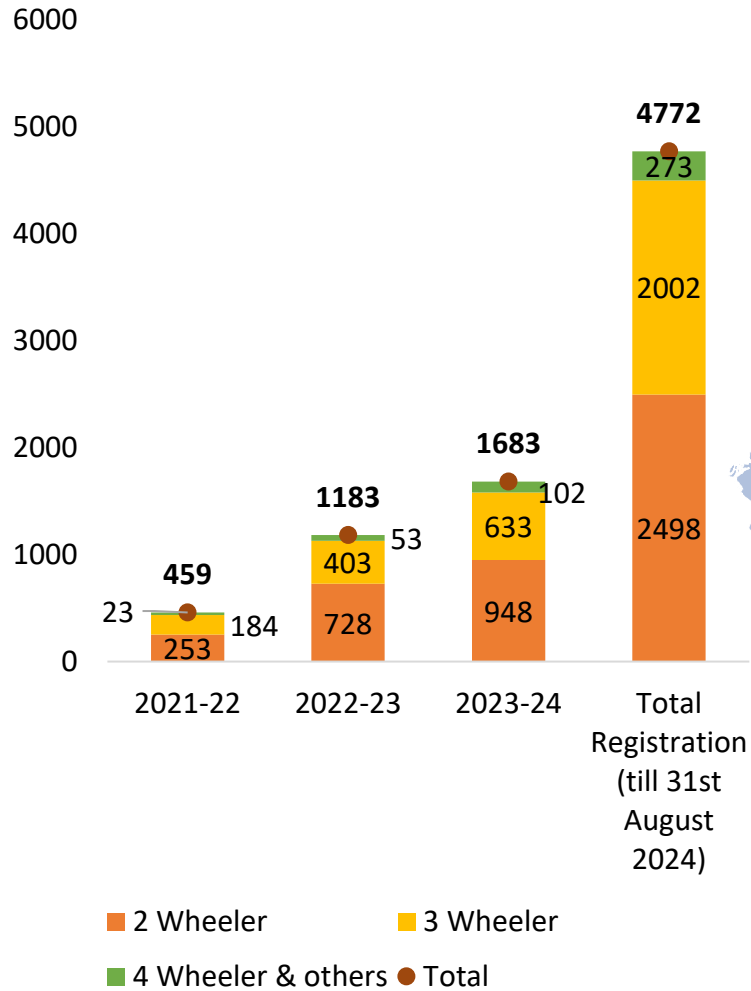
Gas Daily Market Price



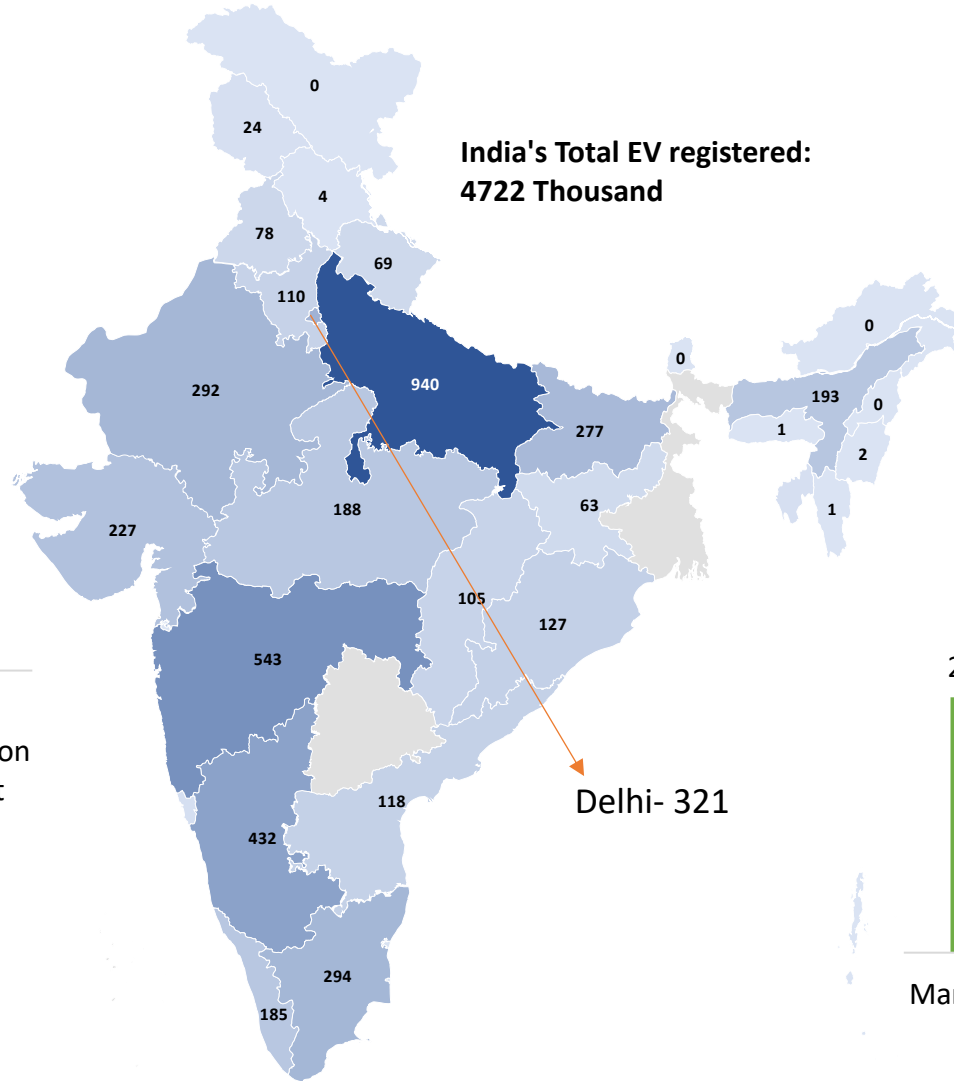
Prices of Gas (USD/MMBTU)				
Date	Henry Hub NG	Japan/ Korea LNG	Dutch TTF NG	IGX Trade
30-Aug-2024	2	14	12	-

Status of Electric Mobility in India

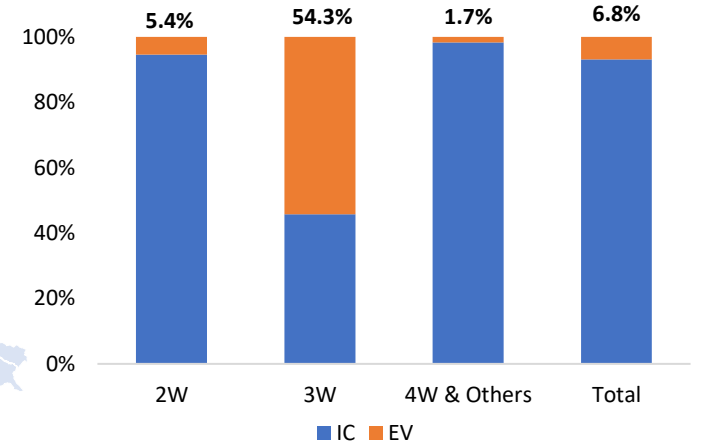
National EV registration (in Thousands)



Cumulative State-wise EV registration as on 31st August 2024 (in Thousands)

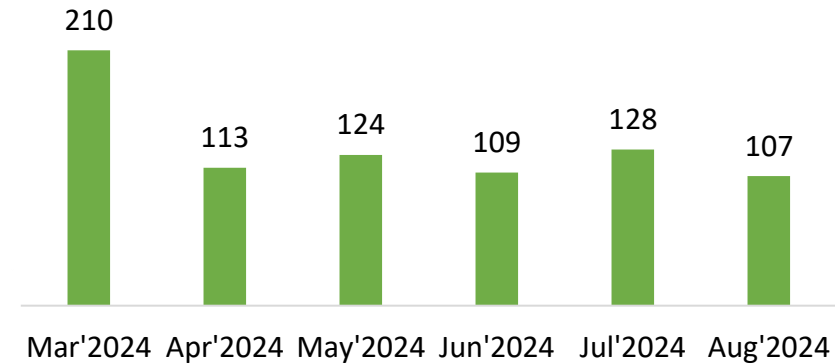


EV and ICE sale composition in 2023-24



Under 3-wheeler (54.3%) EV registration, 45.6% is L3 and 8.7% is L5 vehicles.

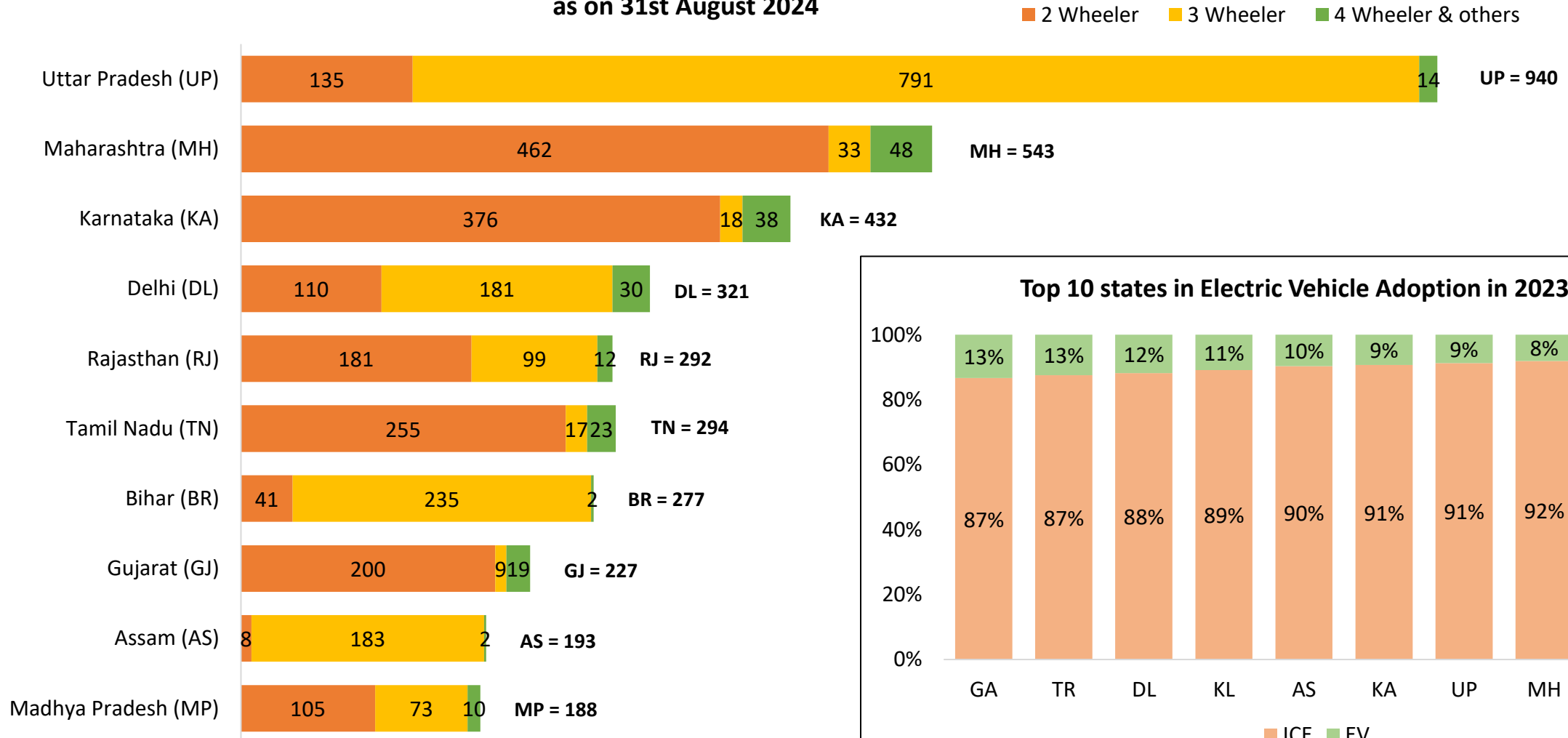
Provisional Monthly EV registered (in Thousands)



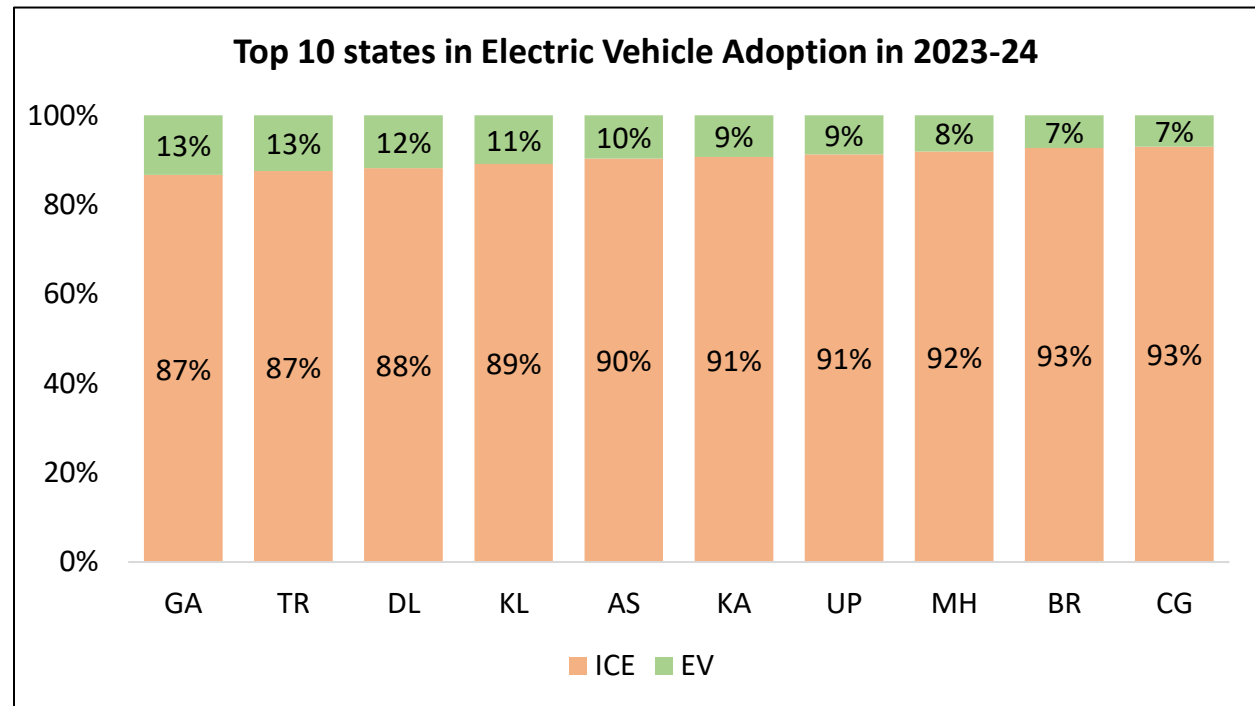
Source: VAHAN Dashboard

Status of Electric Mobility in India

**Top 10 States for Electric Vehicles (in Thousands)
as on 31st August 2024**



Top 10 states in Electric Vehicle Adoption in 2023-24



NOTE: GA- Goa, TR- Tripura, CG- Chhattisgarh, KL- Kerala

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](#) 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.

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) was approved by the Cabinet in January 2023. The mission 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.

MNRE has released the scheme guidelines for the implementation of pilot projects for the use of Green Hydrogen in the [shipping](#), [steel](#), and [transport](#) sectors under the NGHM.

MOP has extended the [waiver of ISTS charges](#) from 30th June 2025 to 31st December 2030.

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.

Jindal Stainless Ltd., in collaboration with Hygenco commissioned [India's 1st green hydrogen plant in the stainless steel sector](#) at Hisar, Haryana, which aims to reduce CO₂ emission by 2,700 metric tonnes per annum.

Key Highlights or Announcements of August 2024

- The Ministry of New Renewable Energy (MNRE) has released the [Guidelines for implementation of Component “Model Solar Village” under PM-Surya Ghar: Muft Bijli Yojana](#). This initiative aims to establish one Model Solar Village in each district across the country. A total of ₹800 crore has been allocated for this component, with central financial assistance of ₹1 crore per model village. The village must be a revenue village with a population size of more than 5,000 as per the latest published Census. However, in northeastern states, union territories, and states like Uttarakhand, Himachal Pradesh, Jammu & Kashmir, and Ladakh, revenue villages with a population of over 2,000 will be eligible.
- The Ministry of Power has released an [“Amendment to the Guidelines for Import/Export \(Cross Border\) of Electricity, 2018”](#). The key amendments are:
 - The amendments empower the central government to permit additional fuel sources for export of coal and gas-based electricity, such as, imported coal or gas, spot e-auction coal, coal from commercial mining, or other sources specified by the Government of India.
 - The Government of India may now permit connection of generating stations to the Indian Grid (Inter-State or Intra-State) to enable power sale within India, even in cases of non-scheduling or payment delays under PPAs.
- Ministry of Power has released the [draft guidelines for Tariff based competitive bidding for procurement of storage capacity/stored energy from Pumped Storage Plants \(PSPs\)](#). The guidelines proposes two models of procurement of PSPs-
 - Build own Operate Transfer (BOOT) Model- with a power purchase agreement period of 25-40 years.
 - Finance Own Operate (FOO) Model- with a power purchase agreement period of 15-25 years.
- On 22nd August 2024, Tamil Nadu unveiled the [“Tamil Nadu Pumped Storage Projects \(PSP\) Policy 2024”](#) effective for 5 years. The policy aims to create a favorable investment environment for both public and private sector entities by providing a clear regulatory framework, financial incentives, and streamlined approval processes to minimize risks and uncertainties. Projects commissioned during the policy period will be eligible for benefits and incentives for up to 40 years, with the possibility of a 10-year extension.
- The Ministry of Power has released updated data on the country's hydroelectric potential. According to a reassessment study conducted by the Central Electricity Authority between 2017 and 2023, India has an exploitable [large hydro potential \(above 25 MW\) of 133,410 MW](#). Additionally, the identified pumped storage potential is 176,280 MW.



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