

India's Energy Overview

April 2024

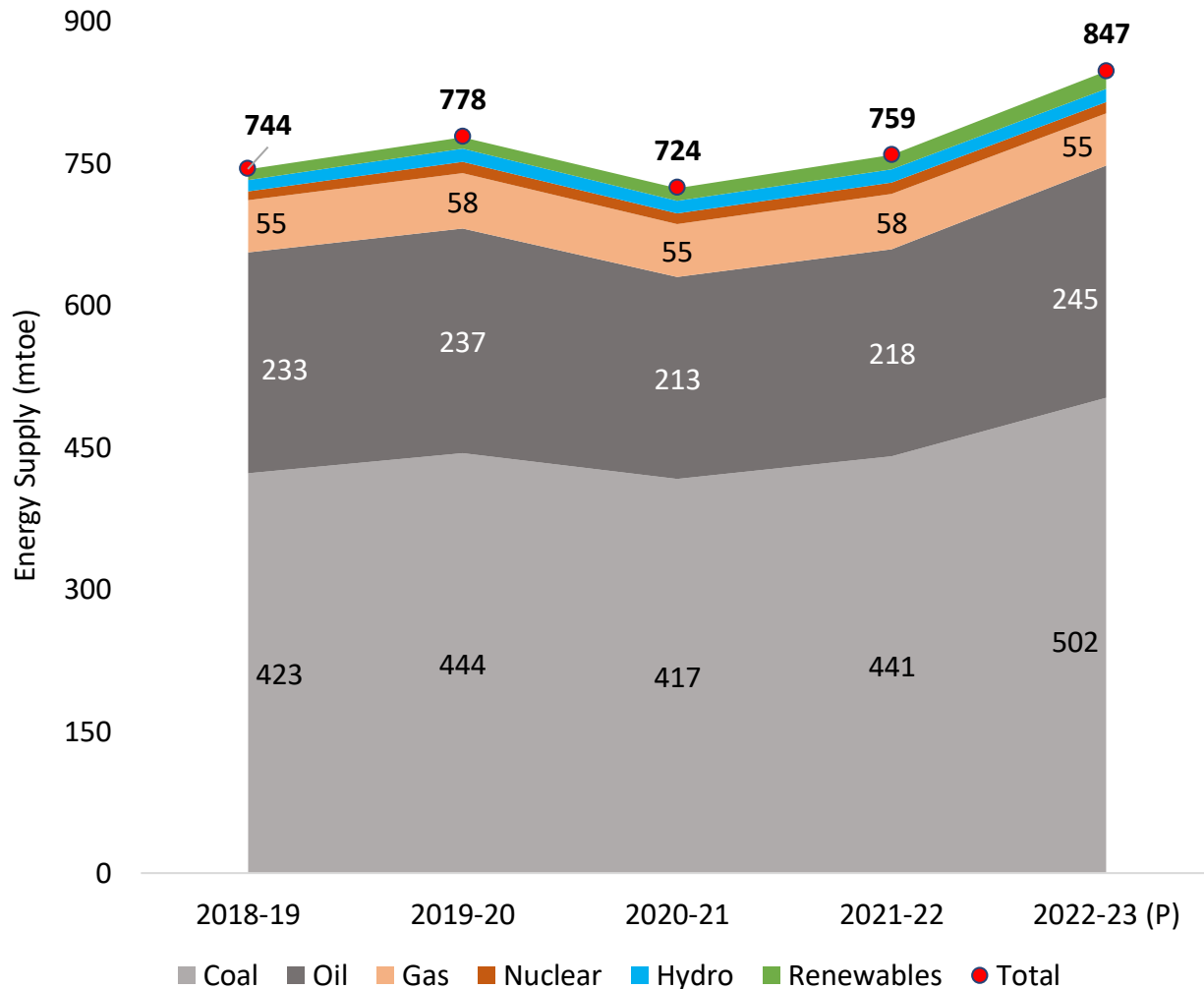


Contents

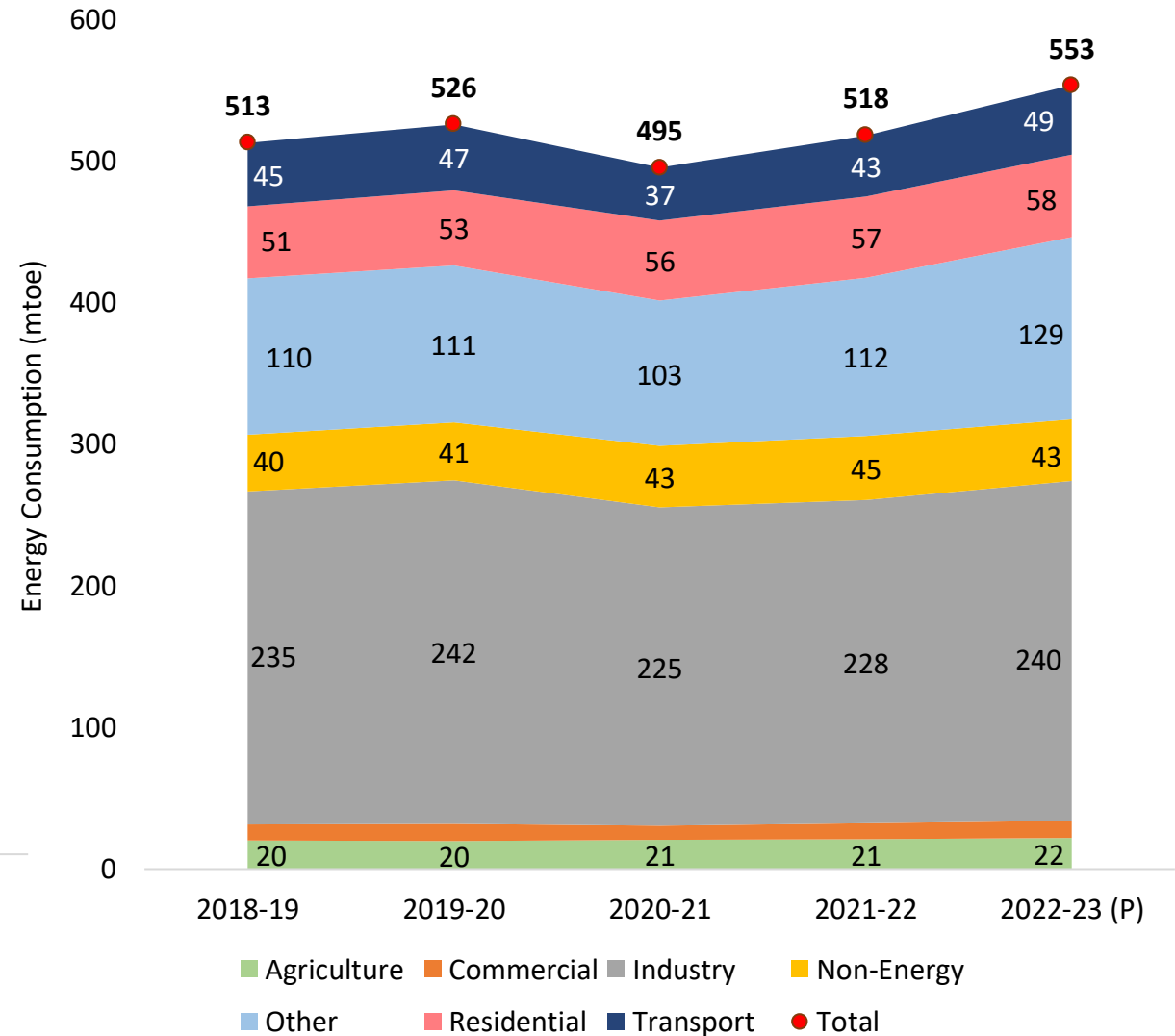
1. Primary Energy Mix in India
2. Per-Capita Energy and Electricity Consumption
3. India's Electricity Capacity Mix (Utility-scale)
4. India's Electricity Addition in last 5 years
5. State-wise Solar Installed Capacity
6. State-wise Wind Installed Capacity
7. RE Potential and Installed Capacity
8. India's Electricity Generation Mix
9. Source-wise PLF/ CUF
10. Thermal Generation Loss and Reasons for Forced Outages
11. Indian Electricity Exchange (IEX) Market Snapshot
12. National and State-level Electricity Demand
13. India's Monthly Electricity Requirement and Supply
14. Monthly Electricity Demand for the top 5 states
15. National and State-level Peak Electricity Demand
16. India's Monthly Peak Electricity Demand and Supply
17. Monthly Peak Electricity Demand for the top 5 states
18. Monthly Coal Statistics
19. Petroleum Products Market Scenario
20. Daily Prices of Crude Oil
21. Gas Market Scenario
22. Daily Prices of Gas
23. Status of Electric Mobility in India
24. Recent Interventions to Promote Renewable Energy
25. Key Highlights or Announcements of April 2024

Primary Energy Mix* in India

Source-wise Primary Energy Supply (mtoe)*

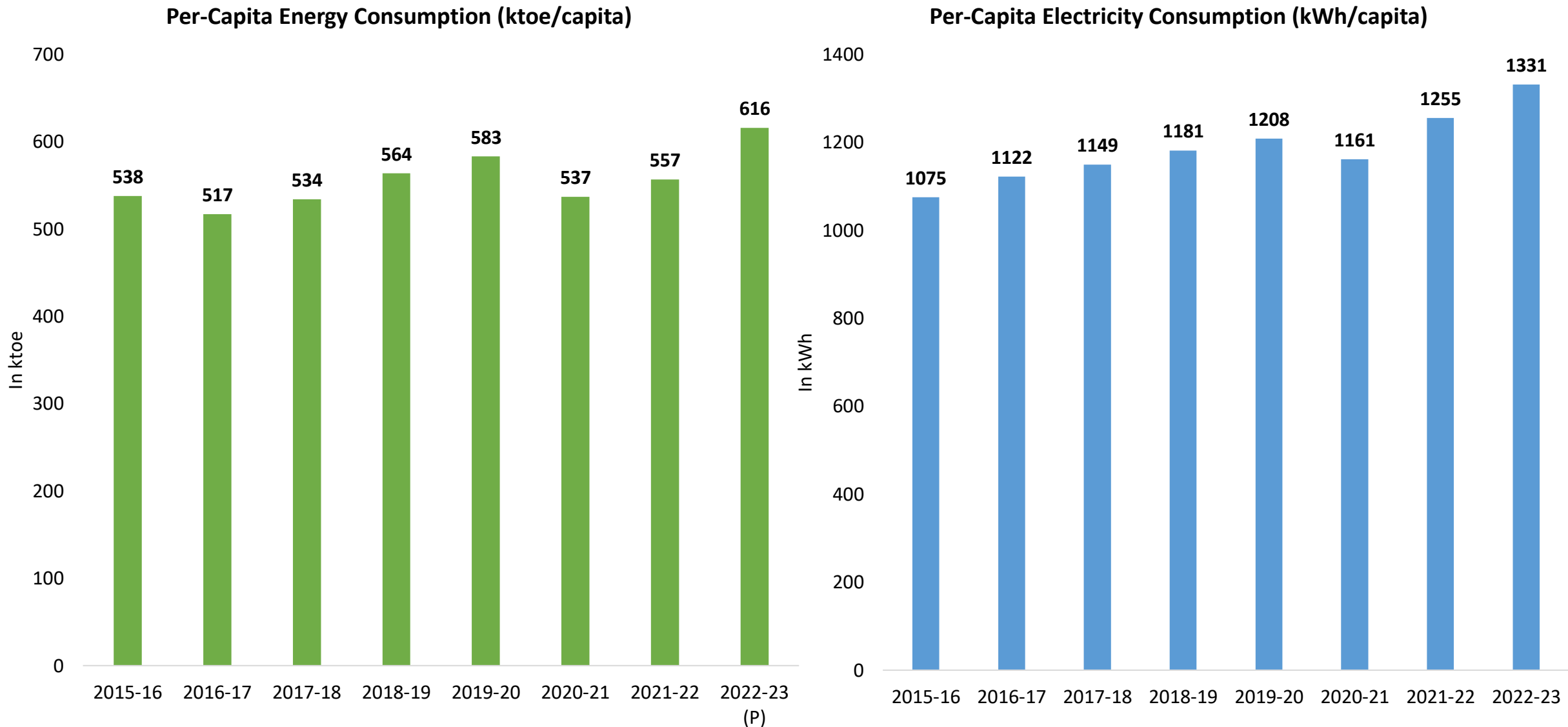


Sector-wise Energy Consumption (mtoe)



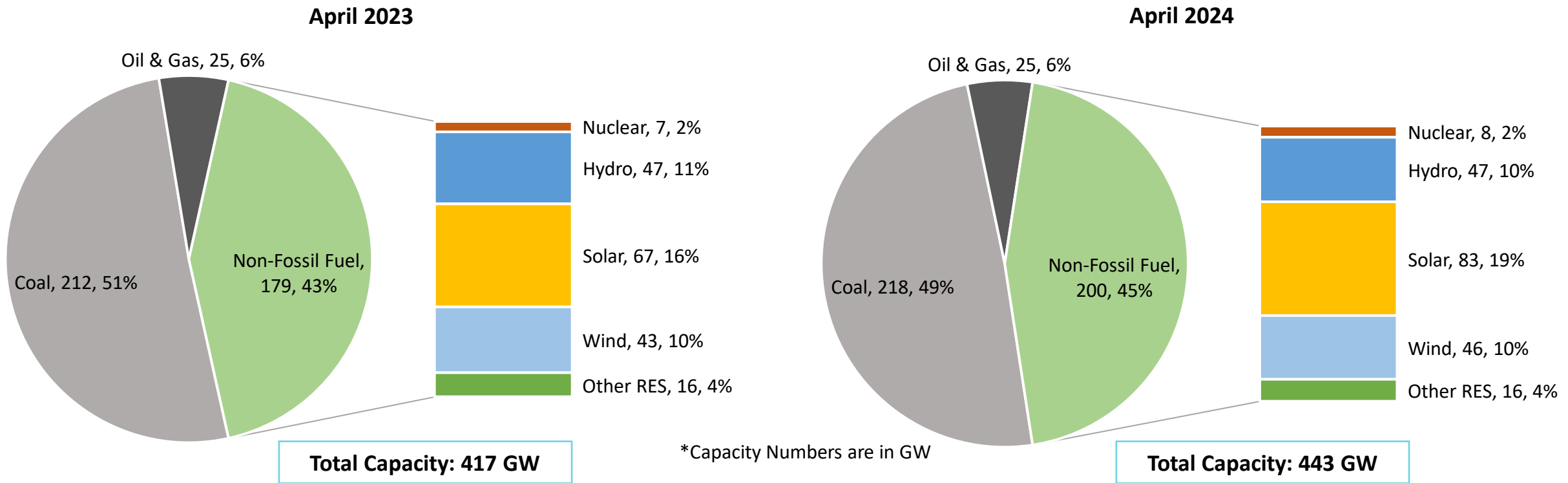
*Excluding biofuels, waste, and other non-commercial source of energy

Per-Capita Energy and Electricity Consumption



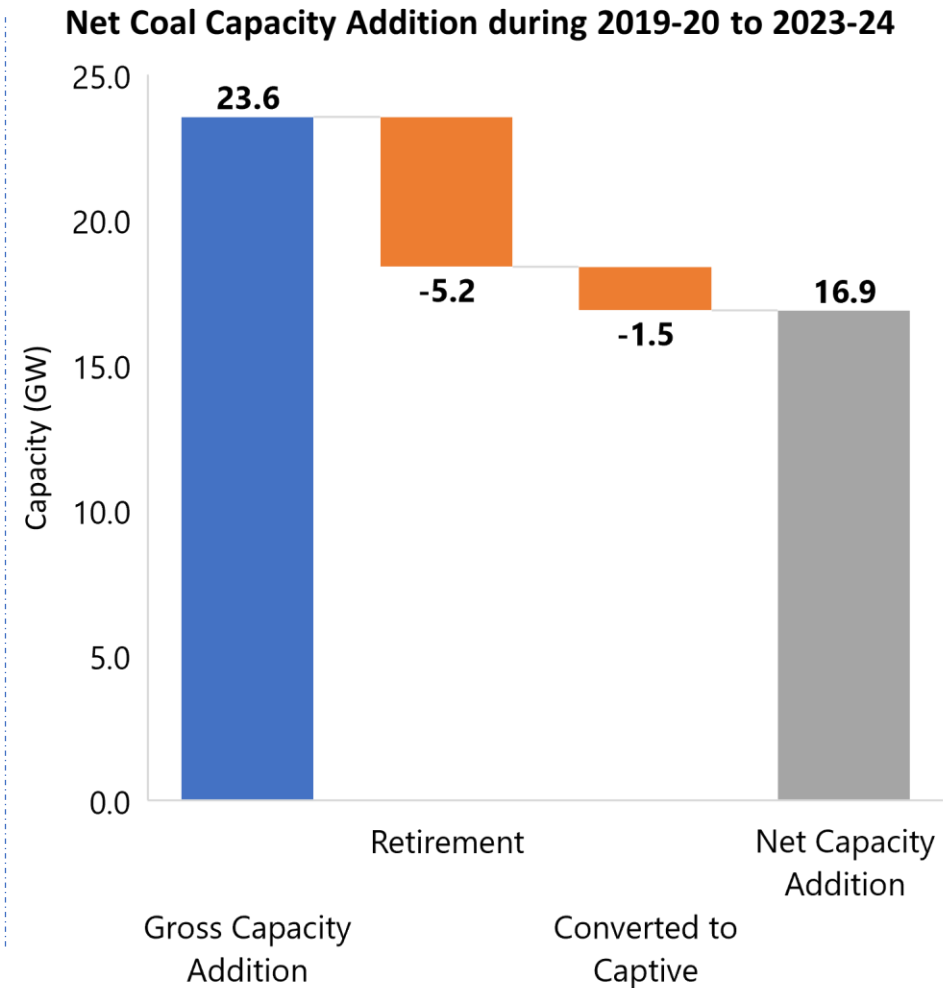
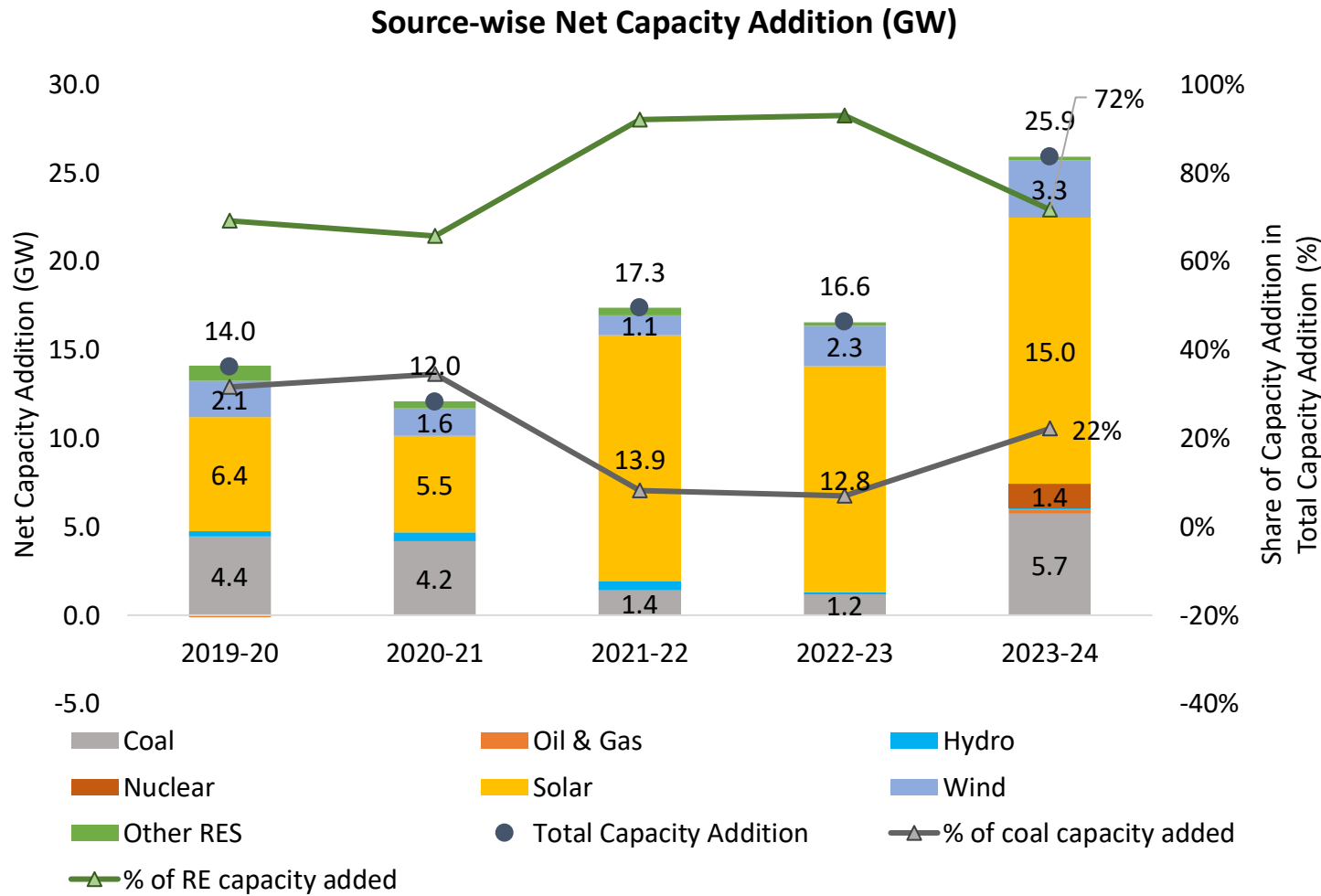
Note: Per Capita energy consumption is calculated on energy supply basis.

India's Electricity Capacity Mix (Utility-scale)



- India's electricity generating capacity is 443 GW as on Apr'2024 [coal 218 GW (49%), solar 83 GW (19%), hydro 47 GW (10%), and wind 46 (10%)].
- As on Apr'2024, the share of non-fossil-based electricity capacity is 45% against the set target of 50% non-fossil capacity by 2030.
- As on Apr'2024, India's renewable energy capacity (including large hydro) stood at 192 GW out of 443 GW.

India's Electricity Capacity Addition in last 5 years



- A total of 61 GW of generation capacity has been added in RE (Hydro, solar, wind, and other RES) over the past 5 years, whereas the net coal capacity addition during the same period was 17 GW, mostly in the central sector.

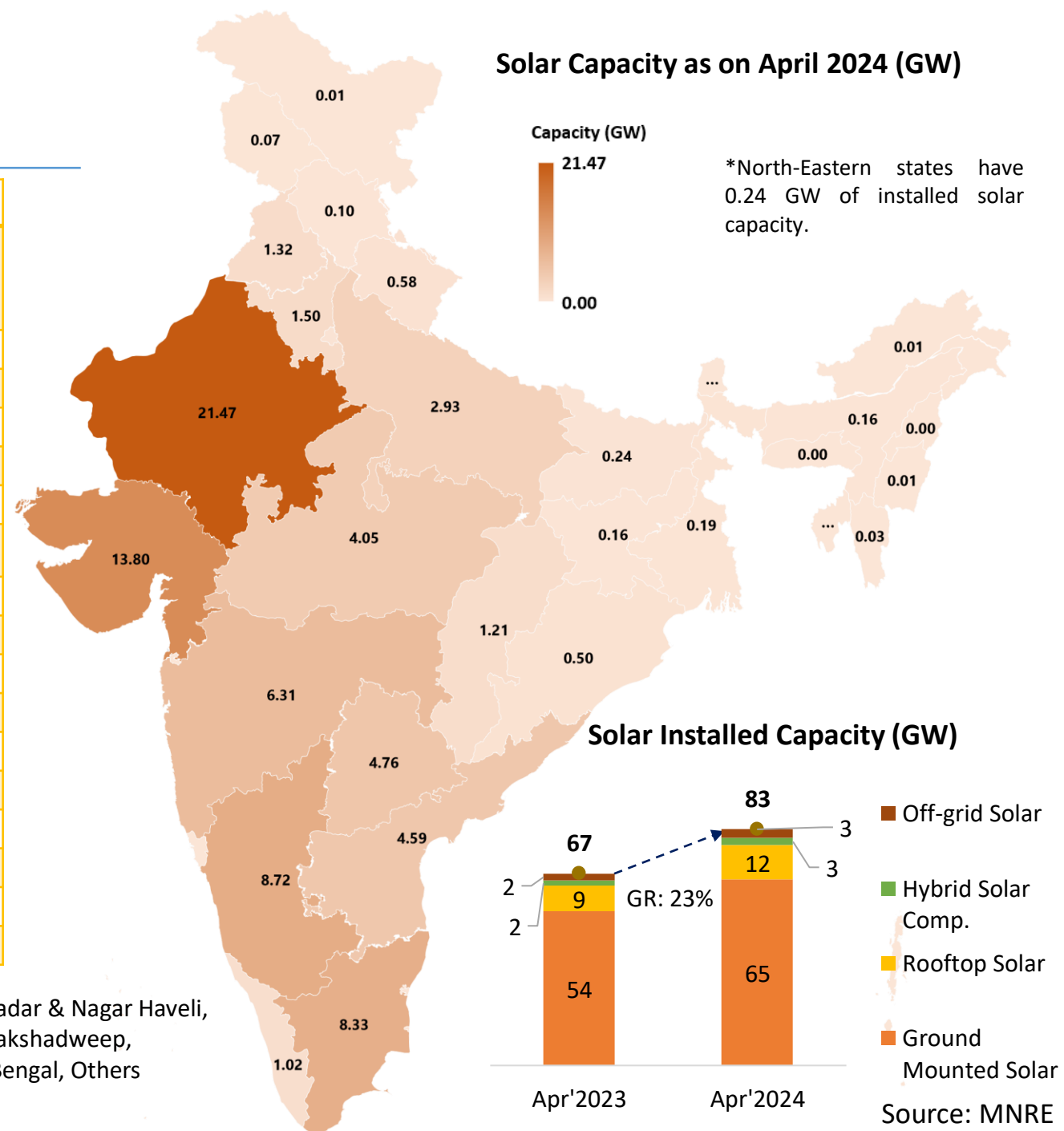
State-wise Solar Capacity

as on April 2024

State-wise installed capacity of Solar Power (GW)					
States	Ground Mounted	Rooftop	Solar Component in Hybrid	Off Grid	Total Solar Power
Rajasthan	17.63	1.19	1.98	0.66	21.47
Gujarat	9.64	3.51	0.59	0.06	13.80
Karnataka	8.09	0.59	0.00	0.04	8.72
Tamil Nadu	7.64	0.62	0.00	0.07	8.33
Maharashtra	3.85	2.07	0.00	0.39	6.31
Telangana	4.36	0.39	0.00	0.01	4.76
Andhra Pradesh	4.30	0.20	0.00	0.09	4.59
Madhya Pradesh	3.60	0.35	0.00	0.10	4.05
Uttar Pradesh	2.45	0.27	0.00	0.22	2.93
Haryana	0.27	0.61	0.00	0.62	1.50
Punjab	0.89	0.36	0.00	0.08	1.32
Chhattisgarh	0.75	0.08	0.00	0.39	1.21
Kerala	0.32	0.68	0.00	0.02	1.02
Uttarakhand	0.30	0.26	0.00	0.01	0.58
Others	0.94	0.84	0.00	0.27	2.05
All India	65.02	12.01	2.57	3.04	82.64

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

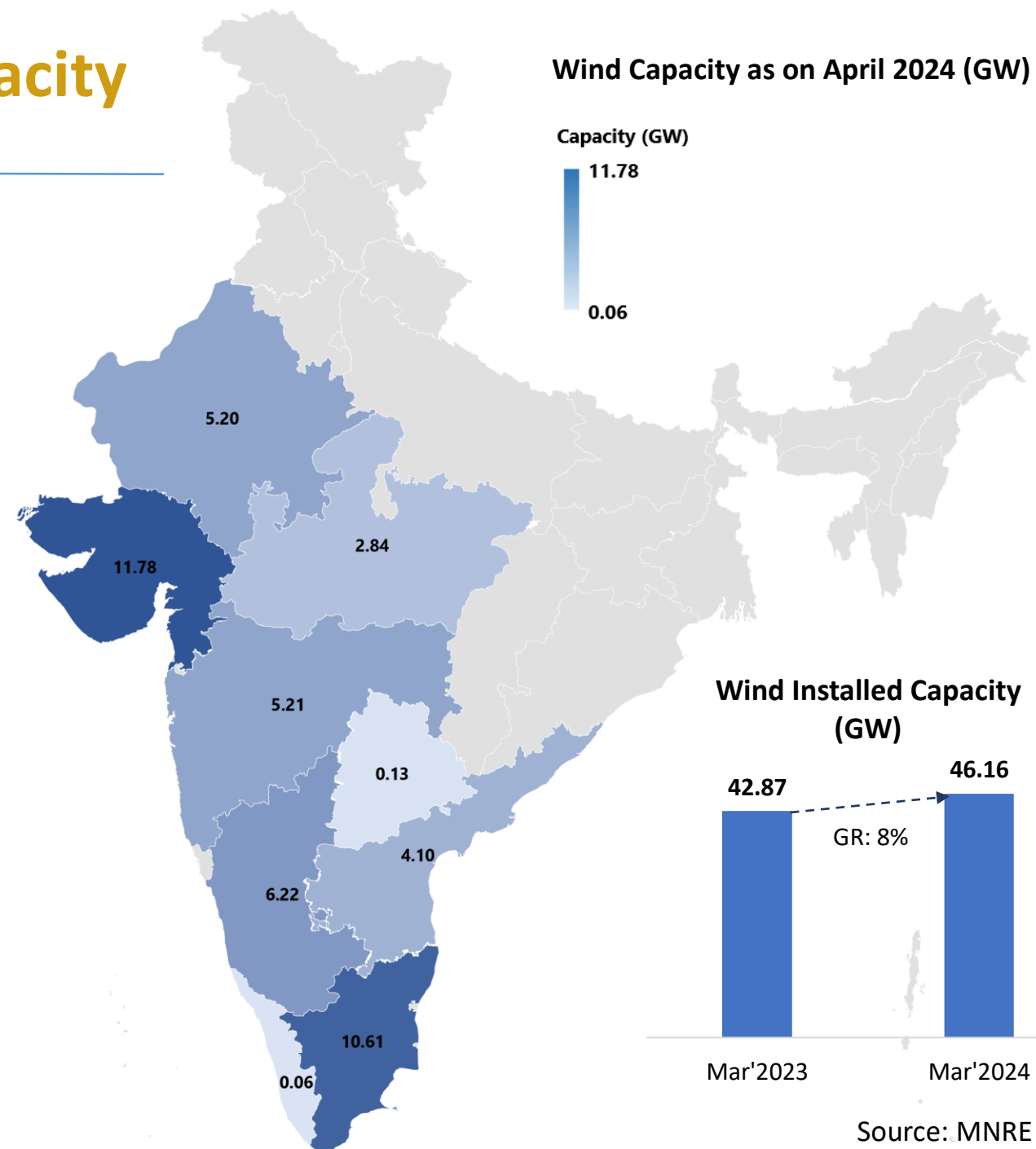
Solar Capacity as on April 2024 (GW)



State-wise Wind Onshore Capacity

as on April 2024

State-wise installed capacity of Wind (Onshore) Power	
States	Installed Capacity (GW)
Gujarat	11.78
Tamil Nadu	10.61
Karnataka	6.22
Maharashtra	5.21
Rajasthan	5.20
Andhra Pradesh	4.10
Madhya Pradesh	2.84
Telangana	0.13
Kerala	0.06
India Total	46.16

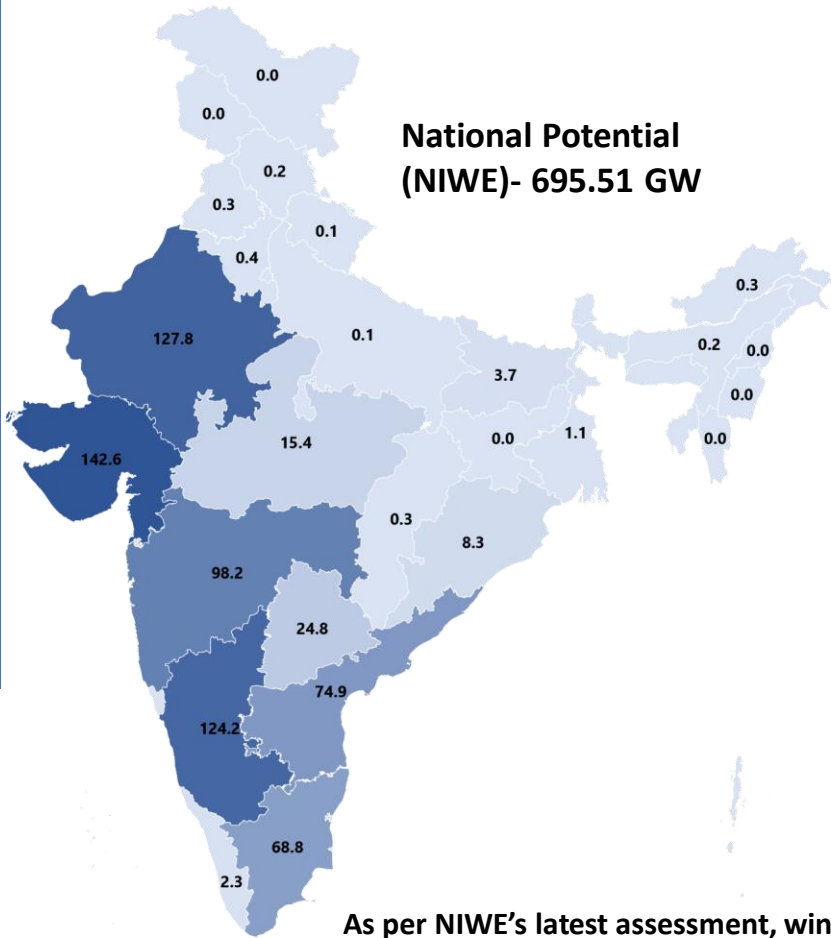


RE Potential and Installed Capacity (1/2)

RE potential in the state

Wind Onshore Potential at 120m agl

State Potential (GW) 0.0 142.6

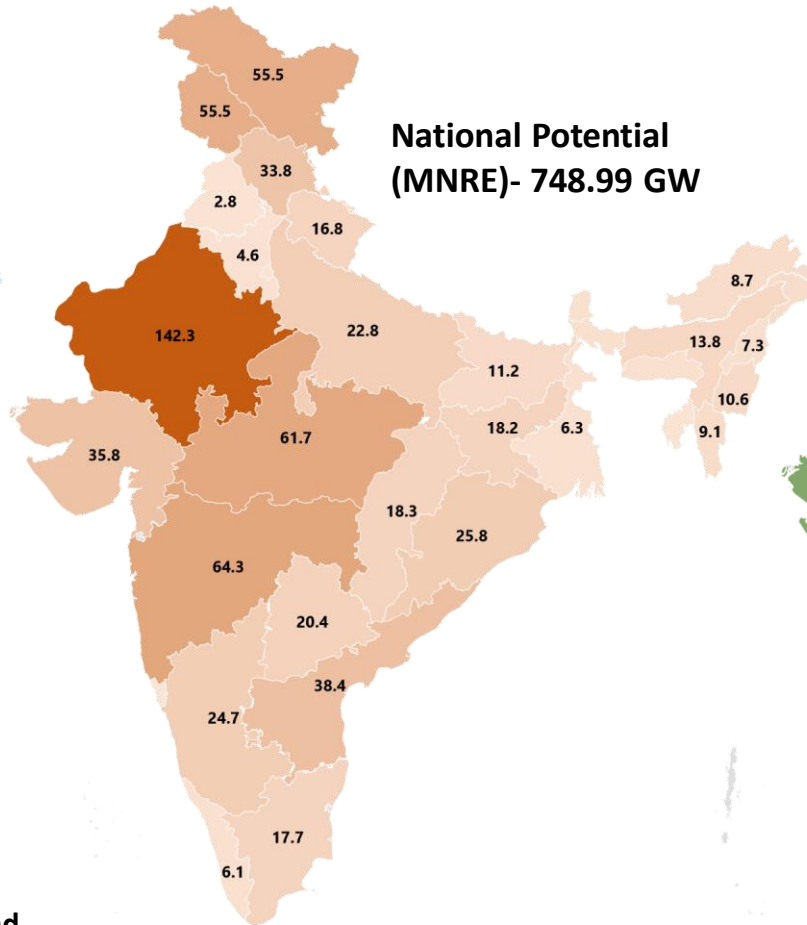


National Potential (NIWE)- 695.51 GW

As per NIWE's latest assessment, wind potential at 150m agl is 1164 GW.

Solar Potential

State Potential (GW) 0.9 142.3

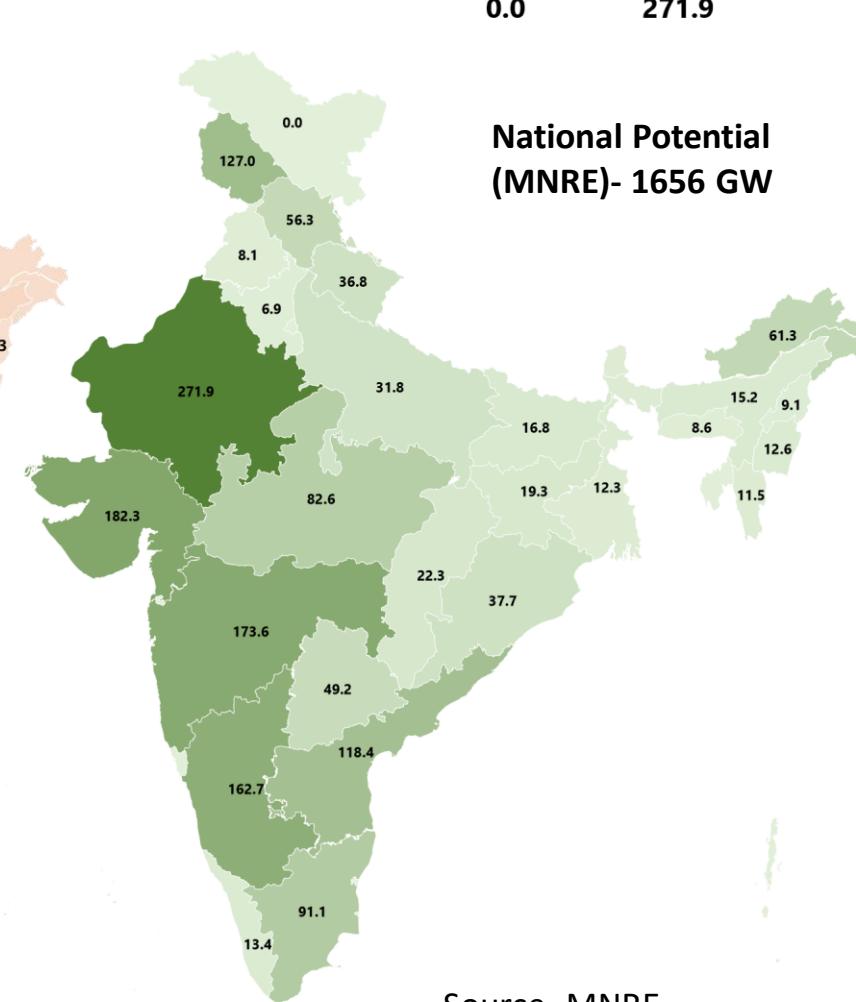


National Potential (MNRE)- 748.99 GW

Market potential for SPV rooftop is 124 GW.

Renewable Energy Potential (all sources including large Hydro)

State Potential (GW) 0.0 271.9

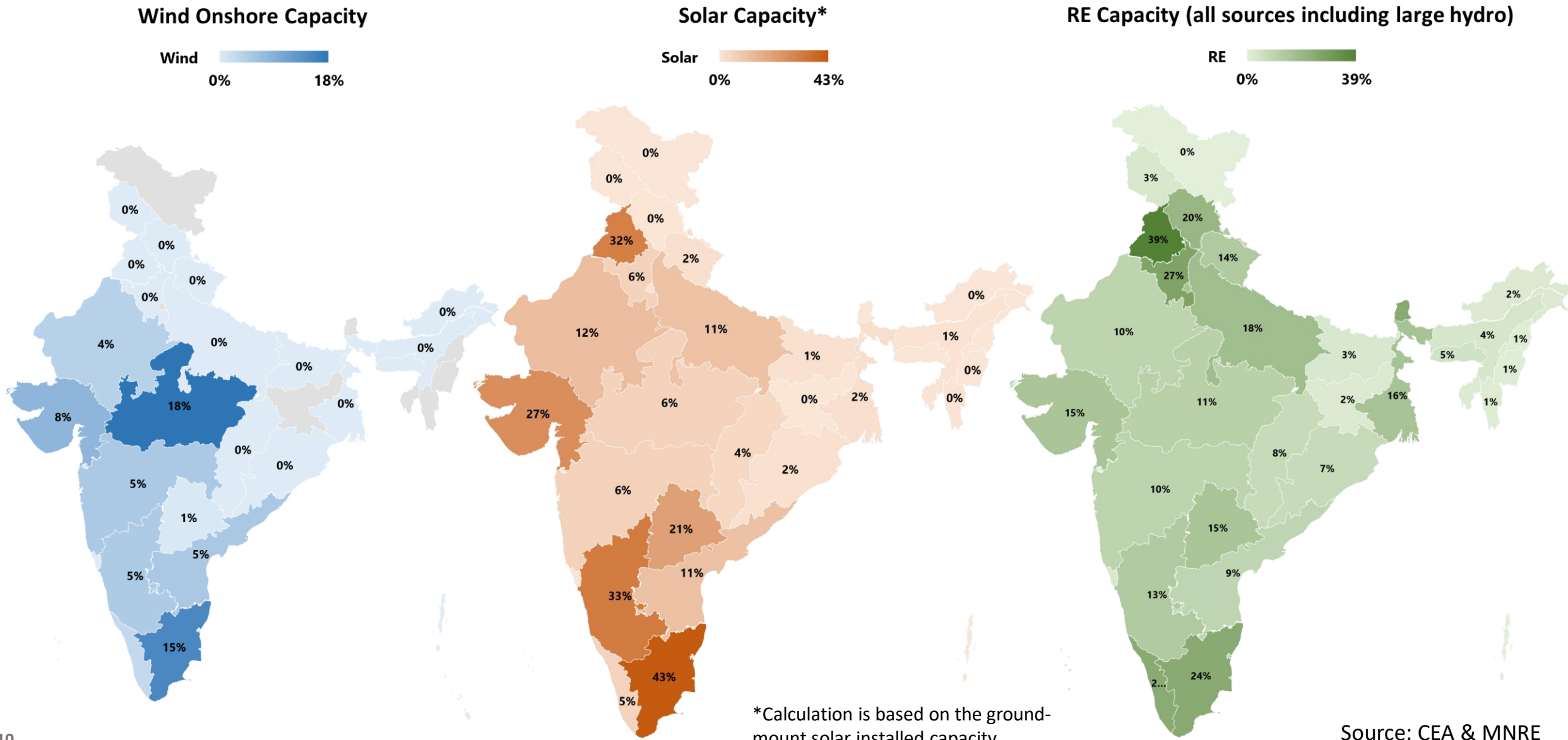


National Potential (MNRE)- 1656 GW

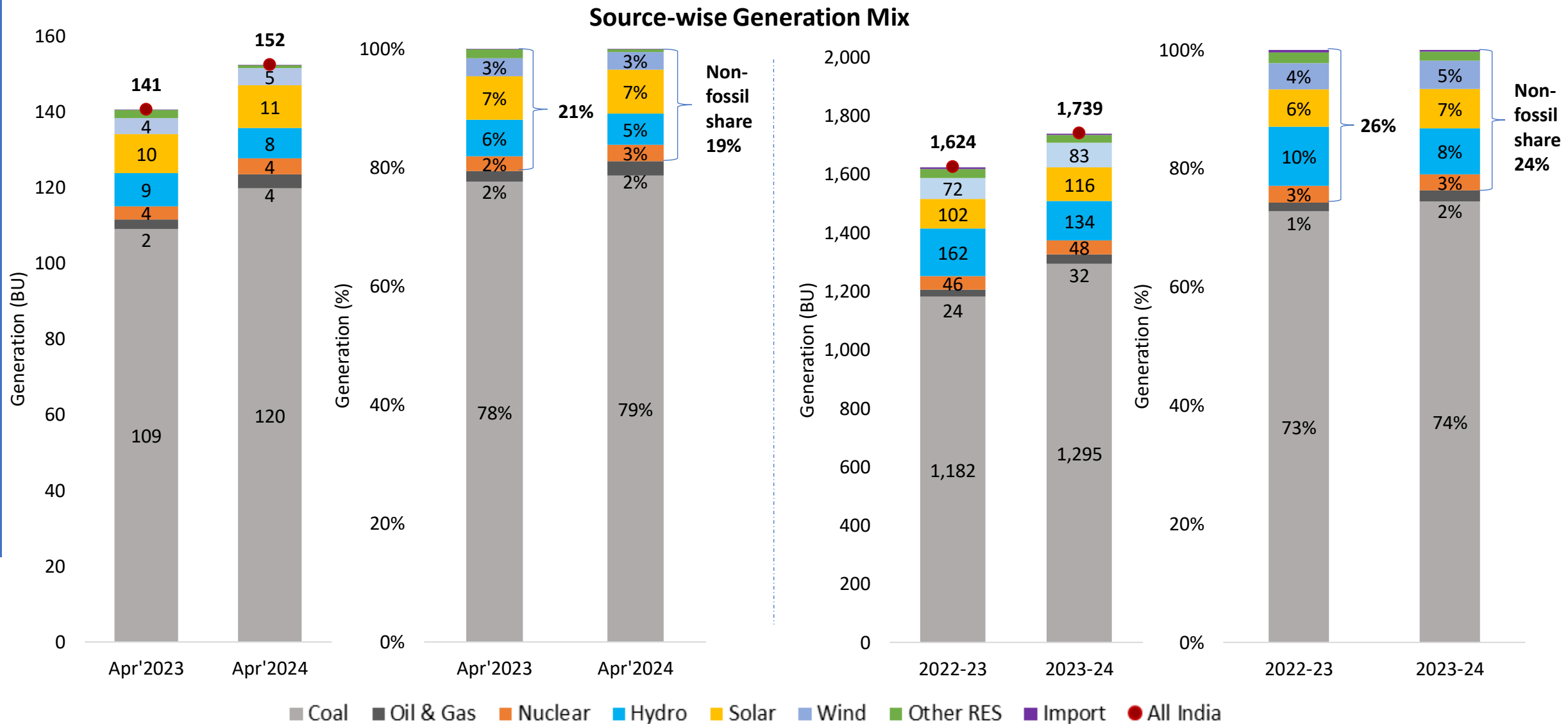
Source- MNRE

RE Potential and Installed Capacity (2/2)

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



India's Electricity Generation Mix

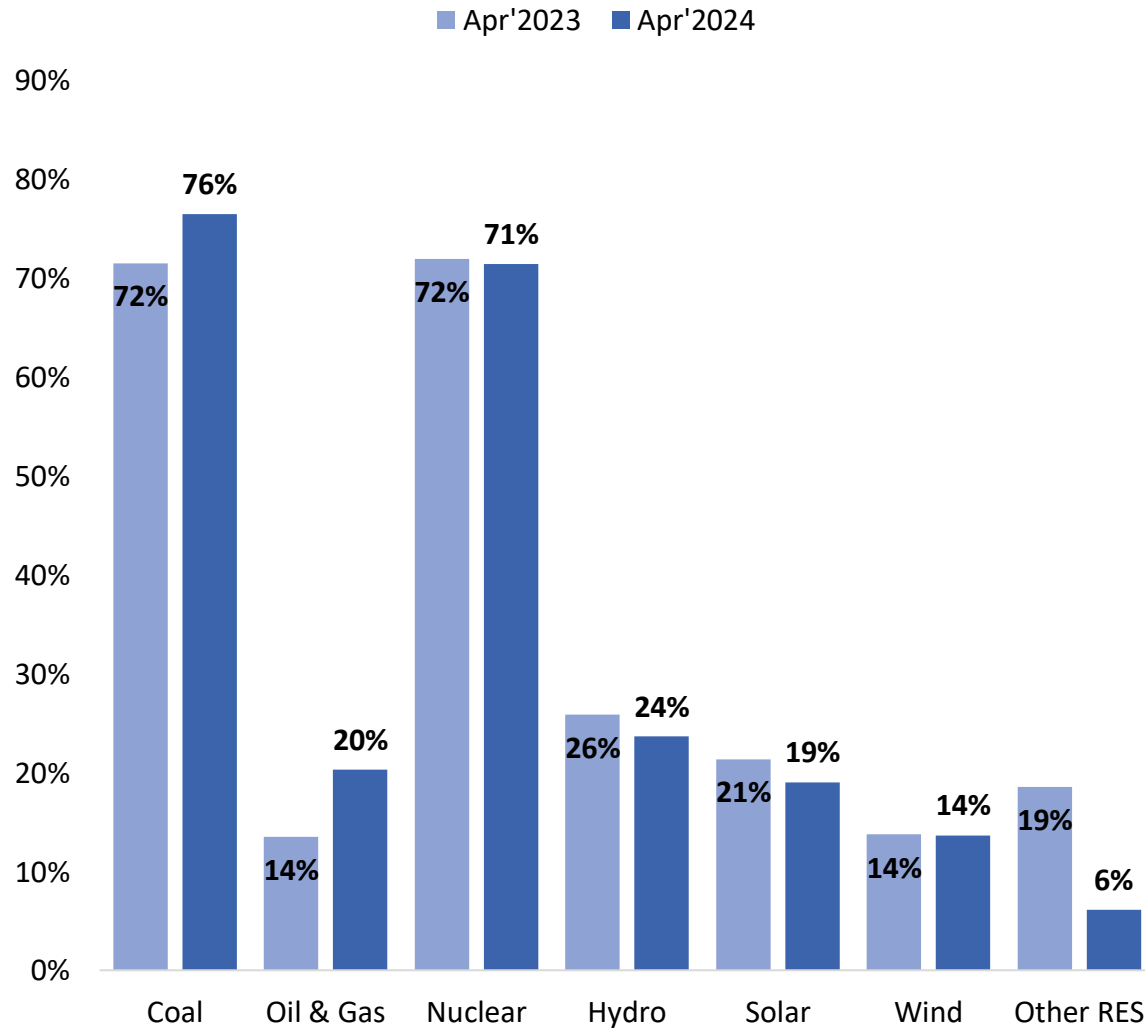


NOTE: The generation data for Apr'2024 is provisional.

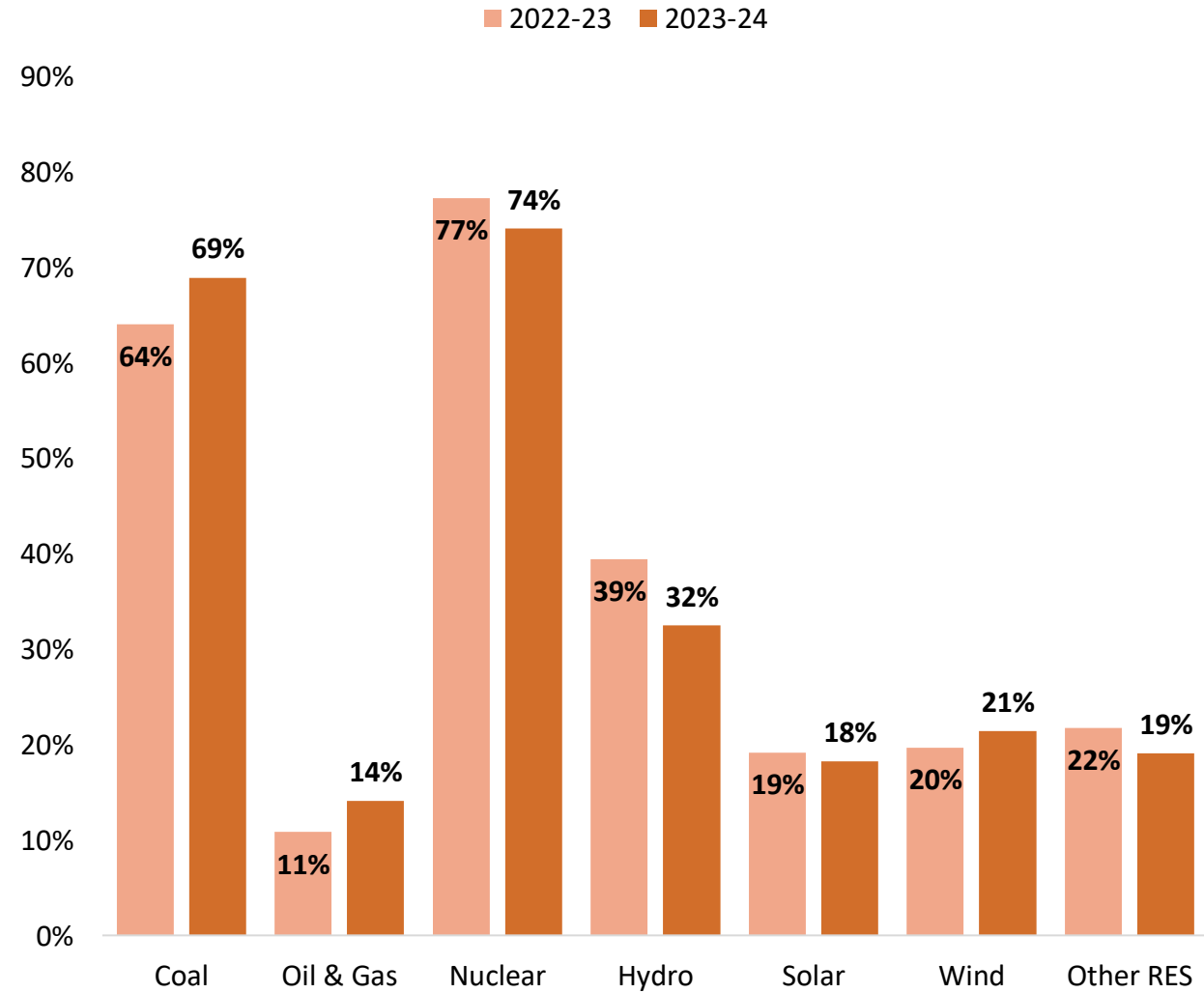
Source: CEA

Source-wise PLF/CUF

Source-wise PLF/ CUF in April (%)



Source-wise PLF/ CUF Comparison (%)

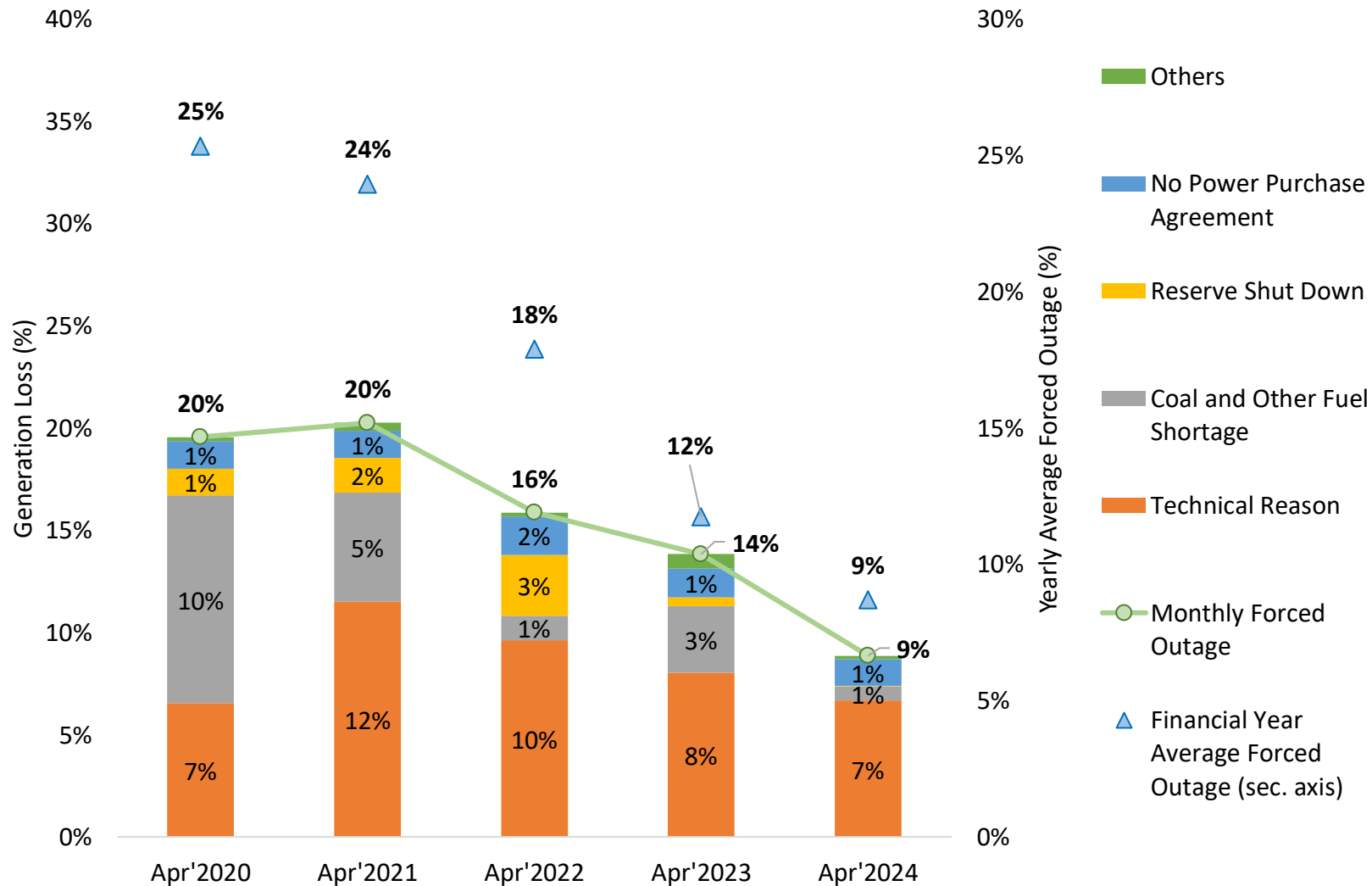


NOTE: The PLF/CUF data is based on provisional generation for Apr'2024.

Source: CEA & MNRE

Thermal Generation Loss and Reasons for Forced Outages

Forced Outages for April over the years



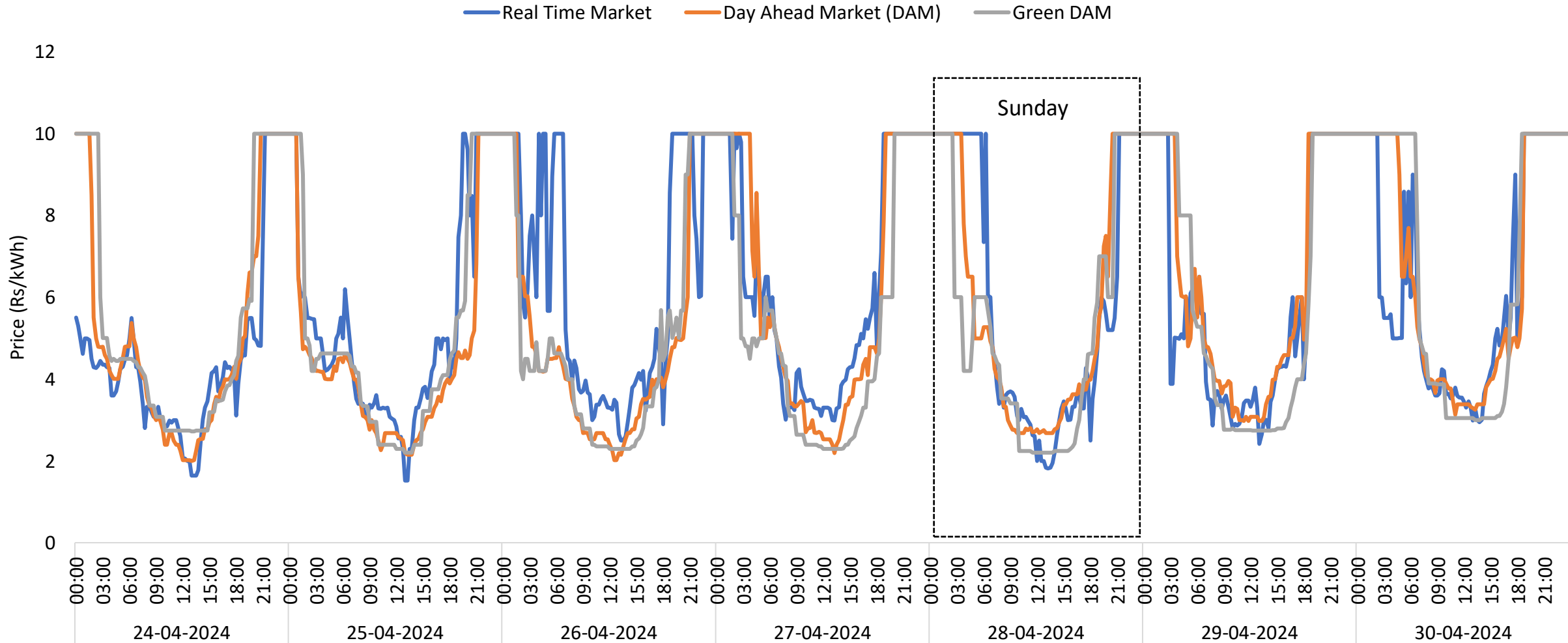
Year/ Month		Average Forced Outage Share
Yearly	FY 2021-22	24%
	FY 2022-23	18%
	FY 2023-24	12%
Monthly	Apr'2022	16%
	Apr'2023	14%
	Apr'2024	9%

Thermal includes only Coal and Lignite Plants.

Source: ICED

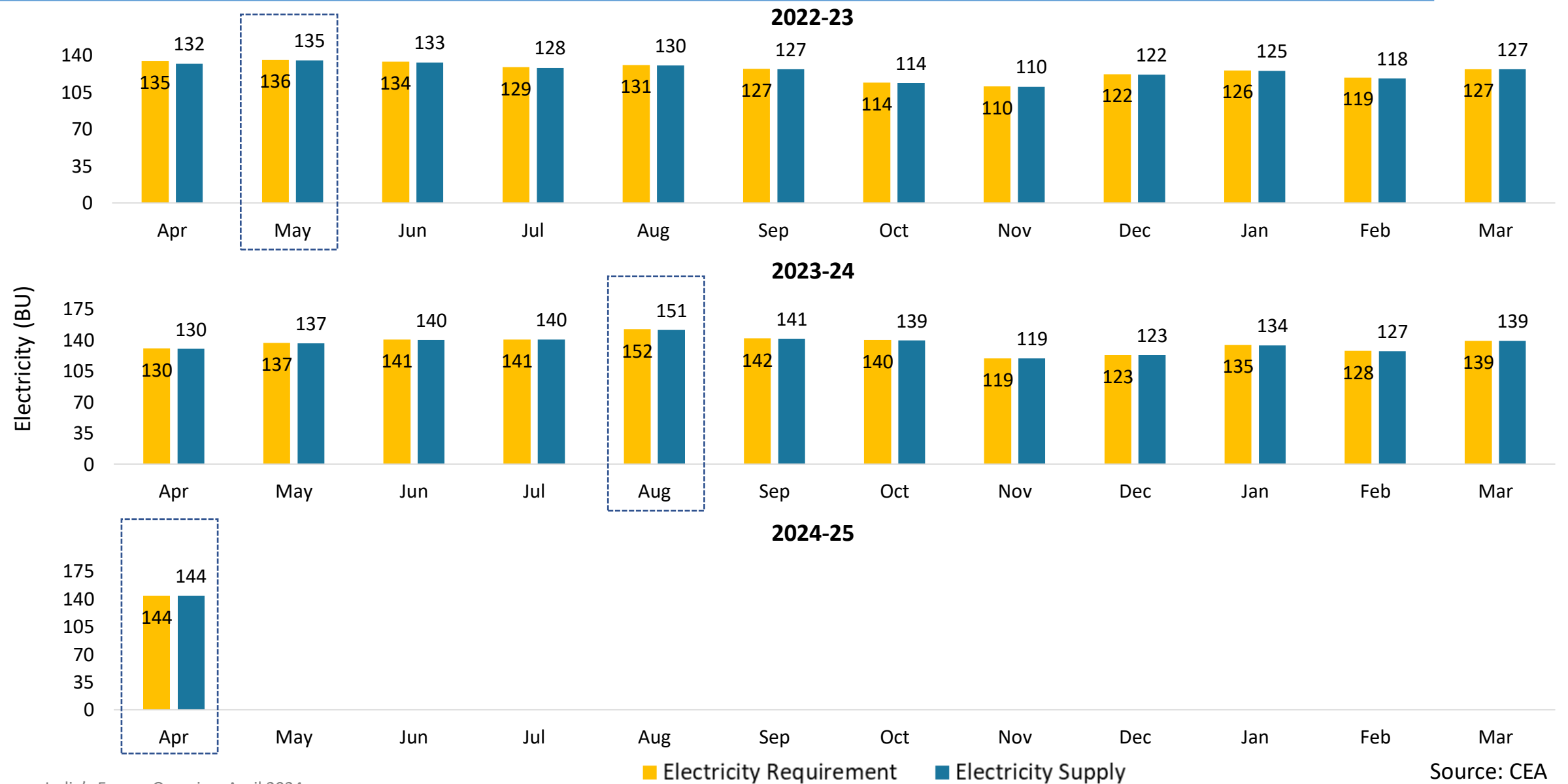
Indian Electricity Exchange (IEX) Market Snapshot

Market Clearing Prices of last 7 days of April 2024



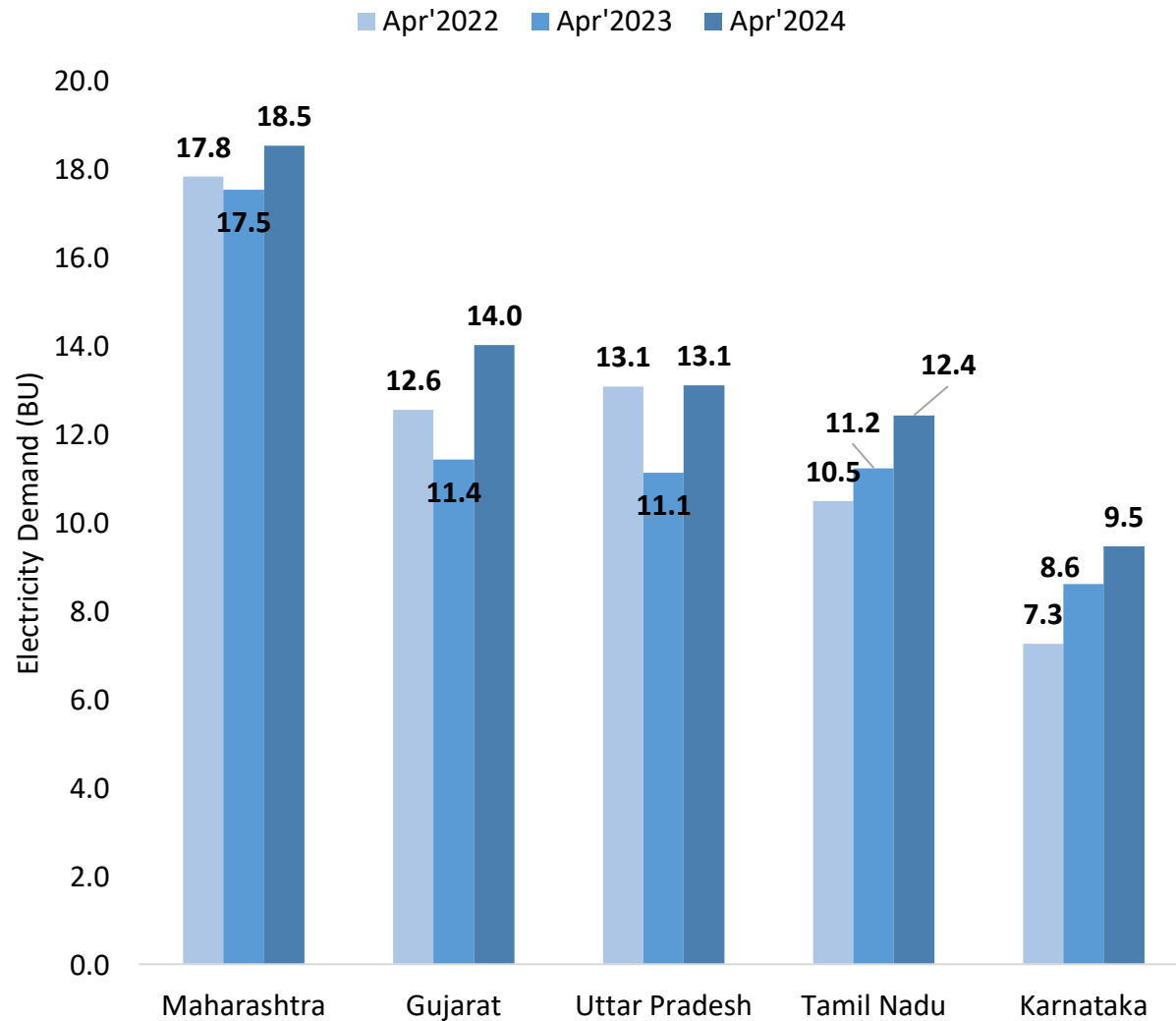
In April 2023, CERC revised the price ceiling from ₹12/kWh to ₹10/kWh in the power exchange market.

India's Monthly Electricity Requirement and Supply

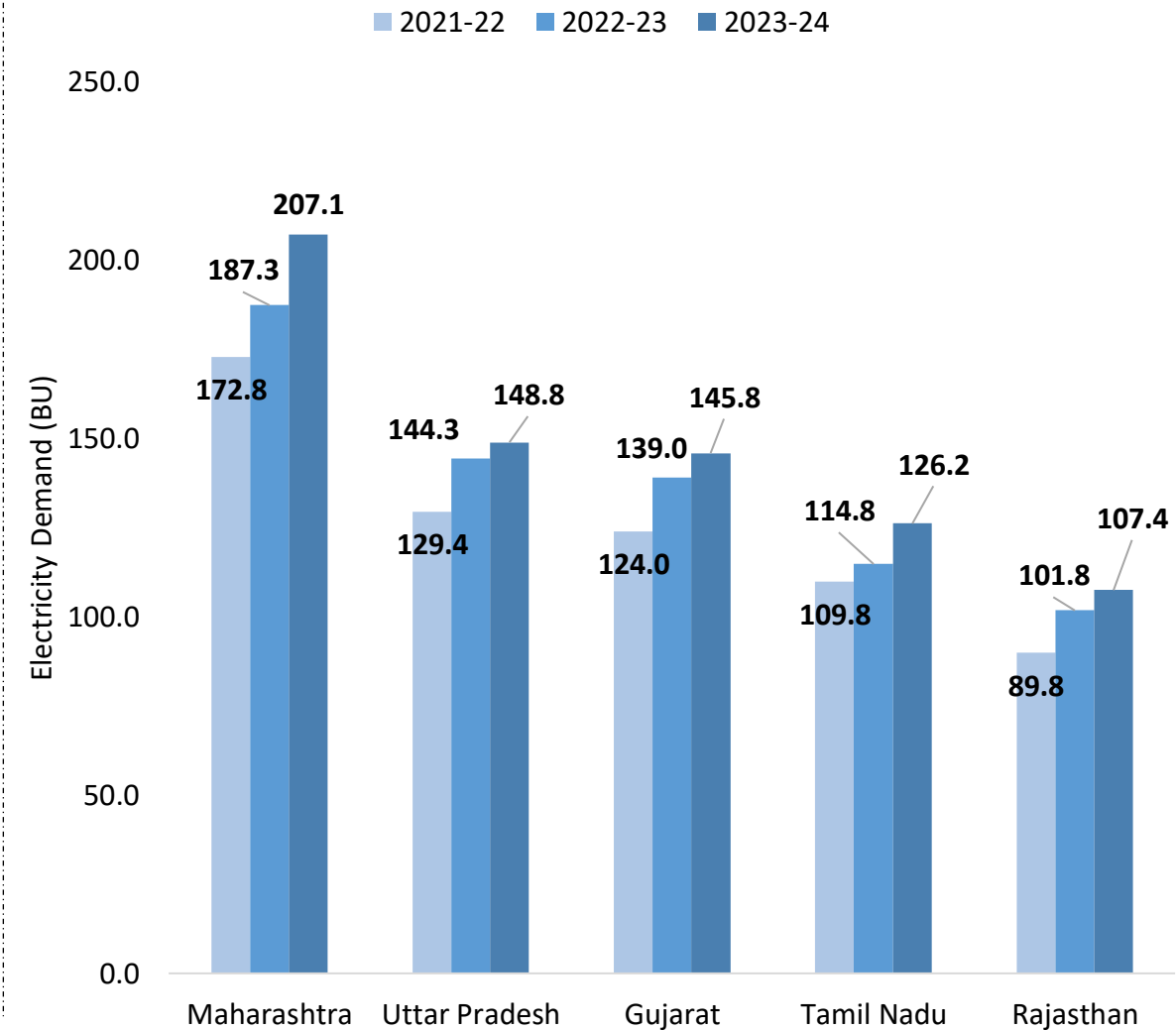


Monthly Electricity Demand of the top 5 states

States with Highest Electricity Demand in April (BU)



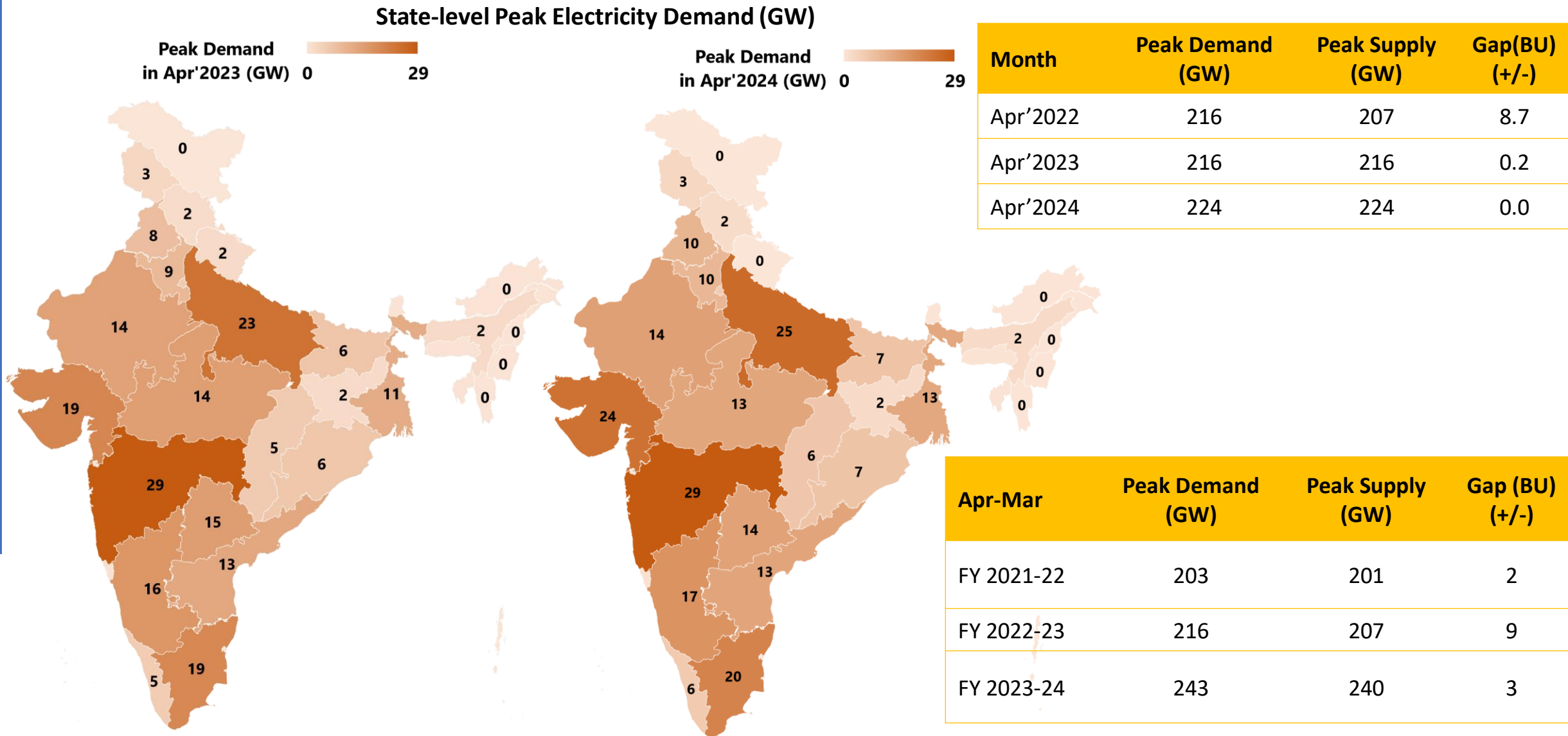
States with Highest Electricity Demand (BU)



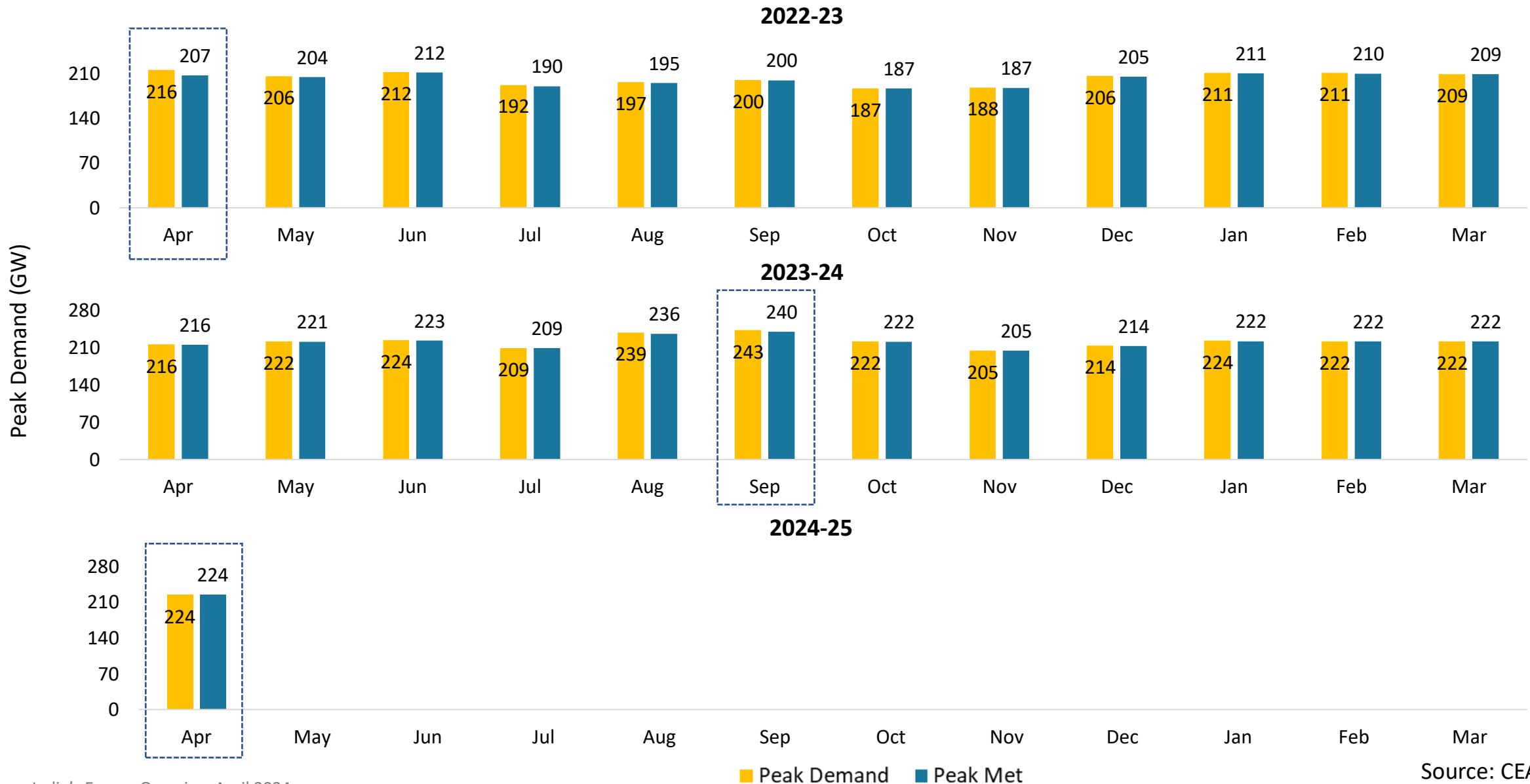
Note: P is Provisional

Source: CEA

National and State level Peak Electricity Demand

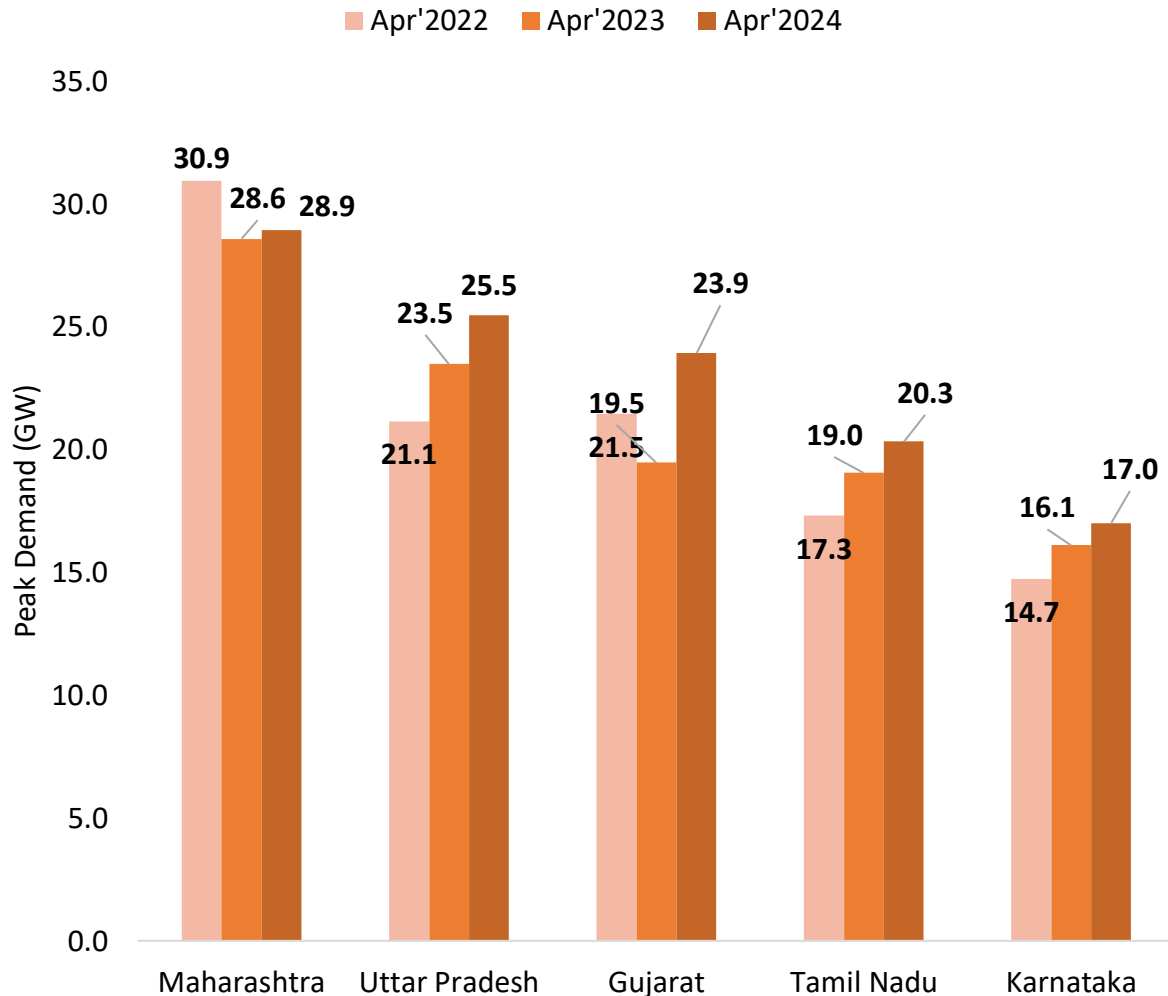


India's Monthly Peak Electricity Demand and Supply

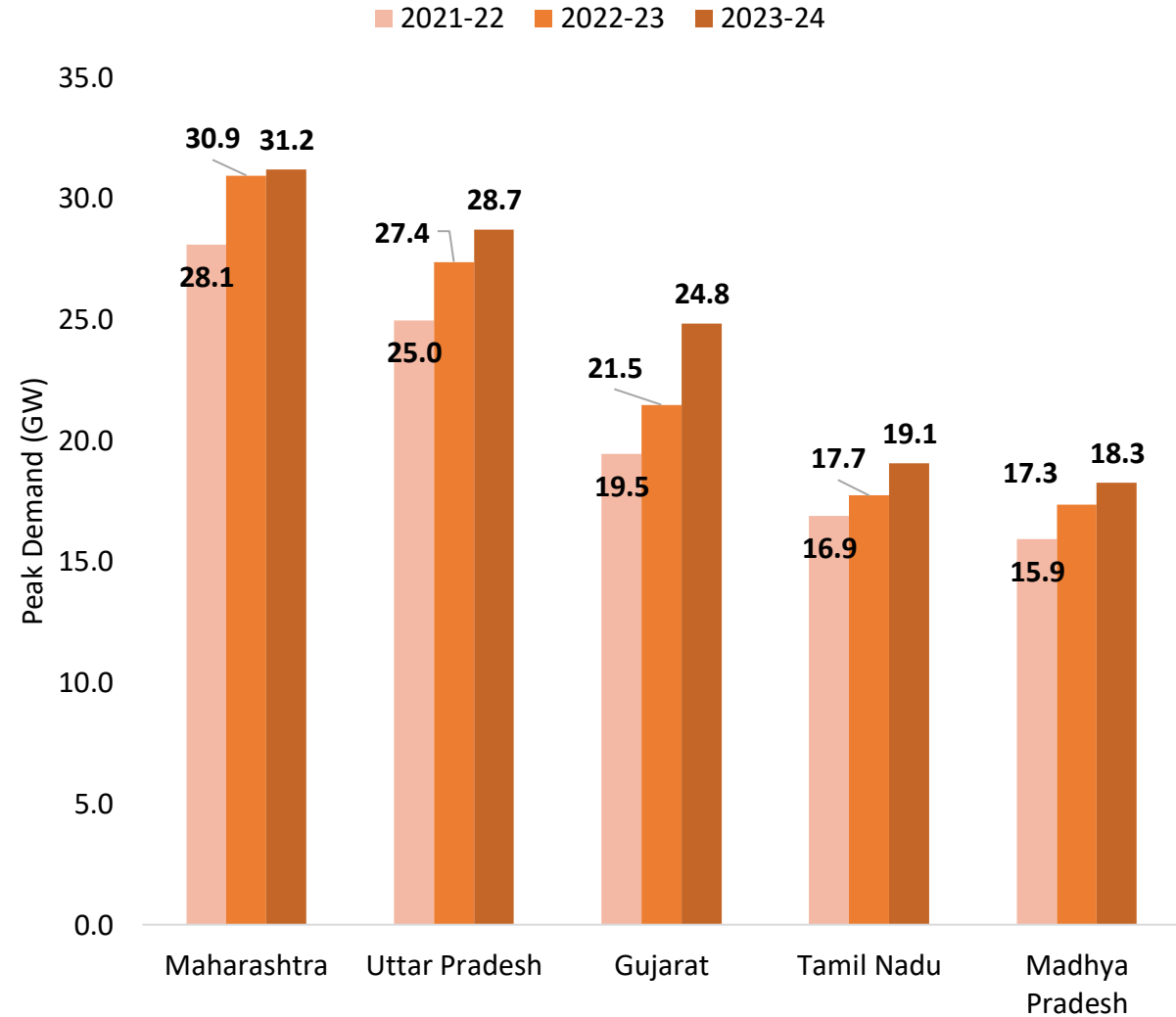


Monthly Peak Electricity Demand of the top 5 states

States with Highest Peak Electricity Demand in April (GW)

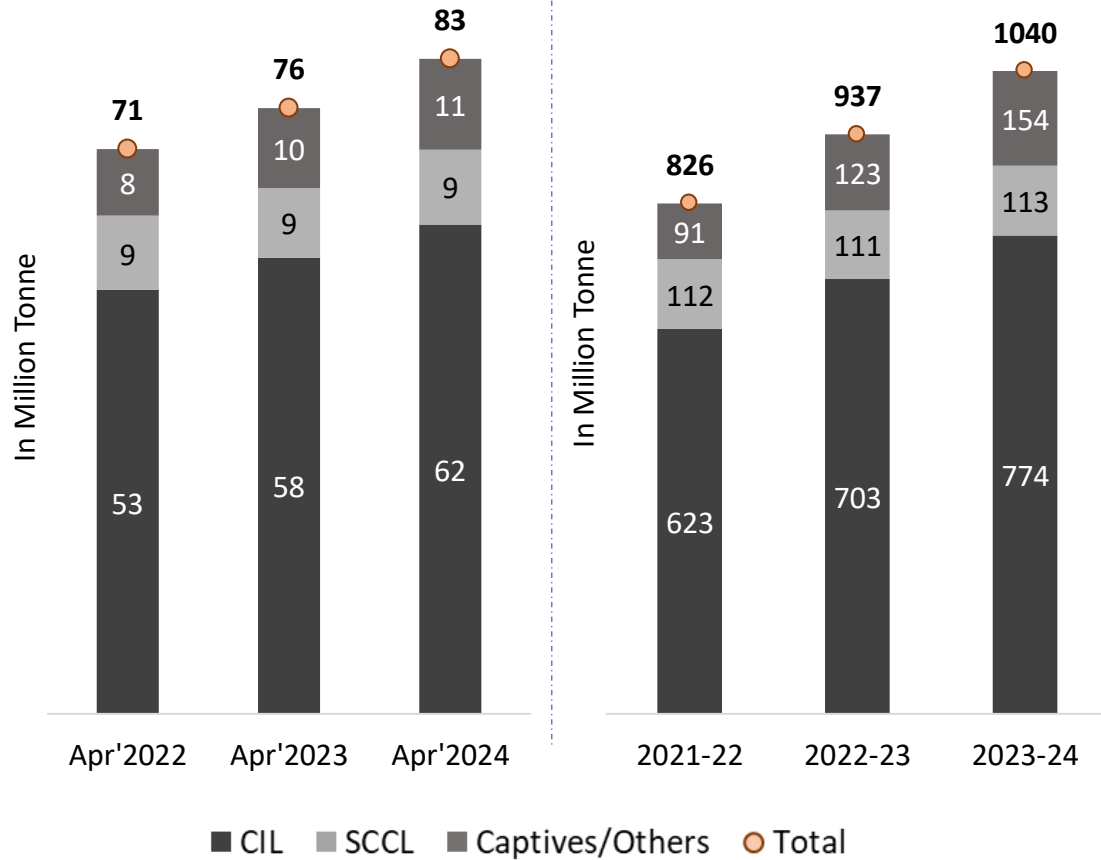


States with Highest Peak Electricity Demand (GW)



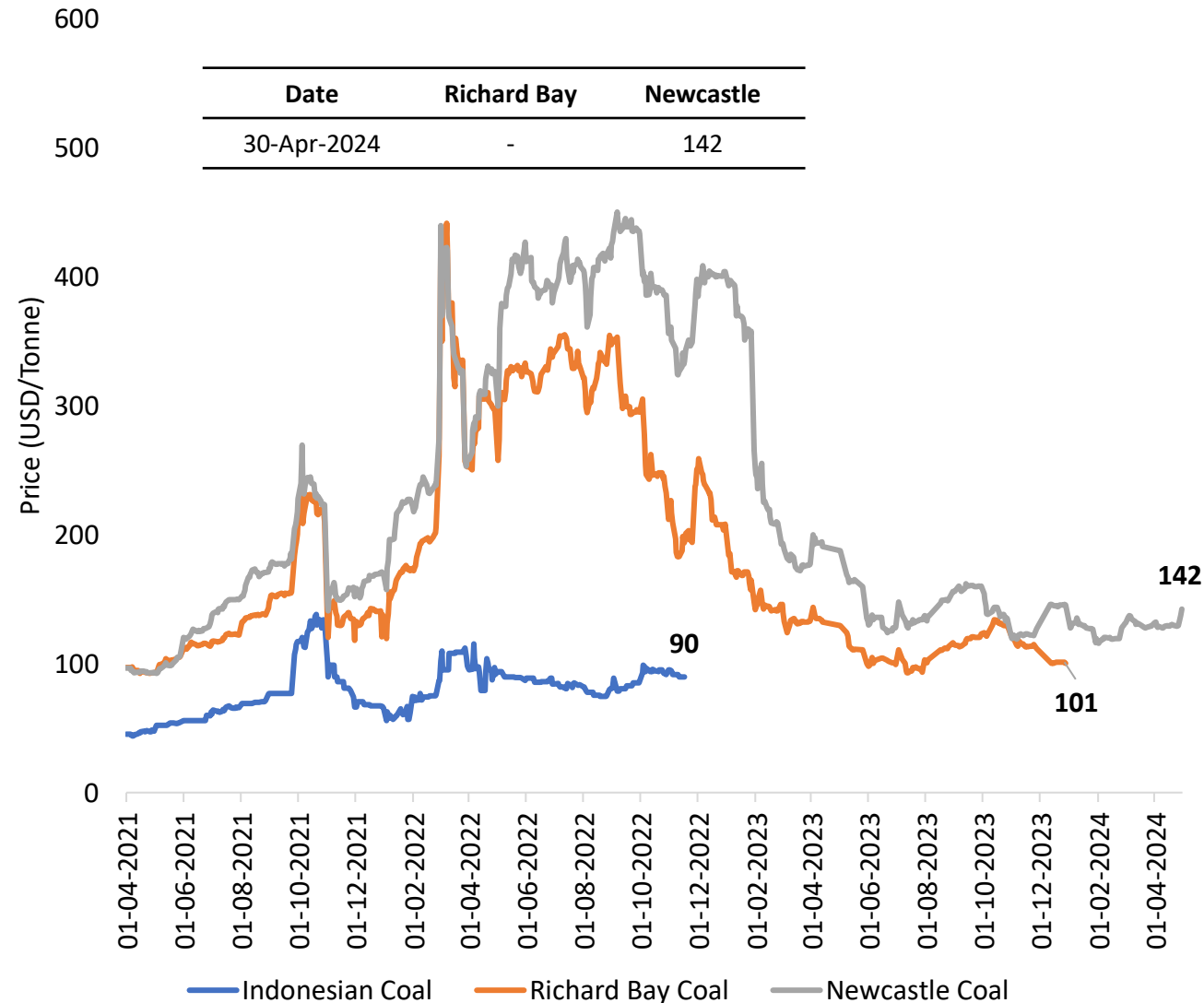
Monthly Coal Statistics

Coal (incl. lignite) Production (in Million Tonnes)



India's coal (incl. lignite) production increased in Apr'2024 (83 MT) by 8% as compared to Apr'2023 (76 MT).

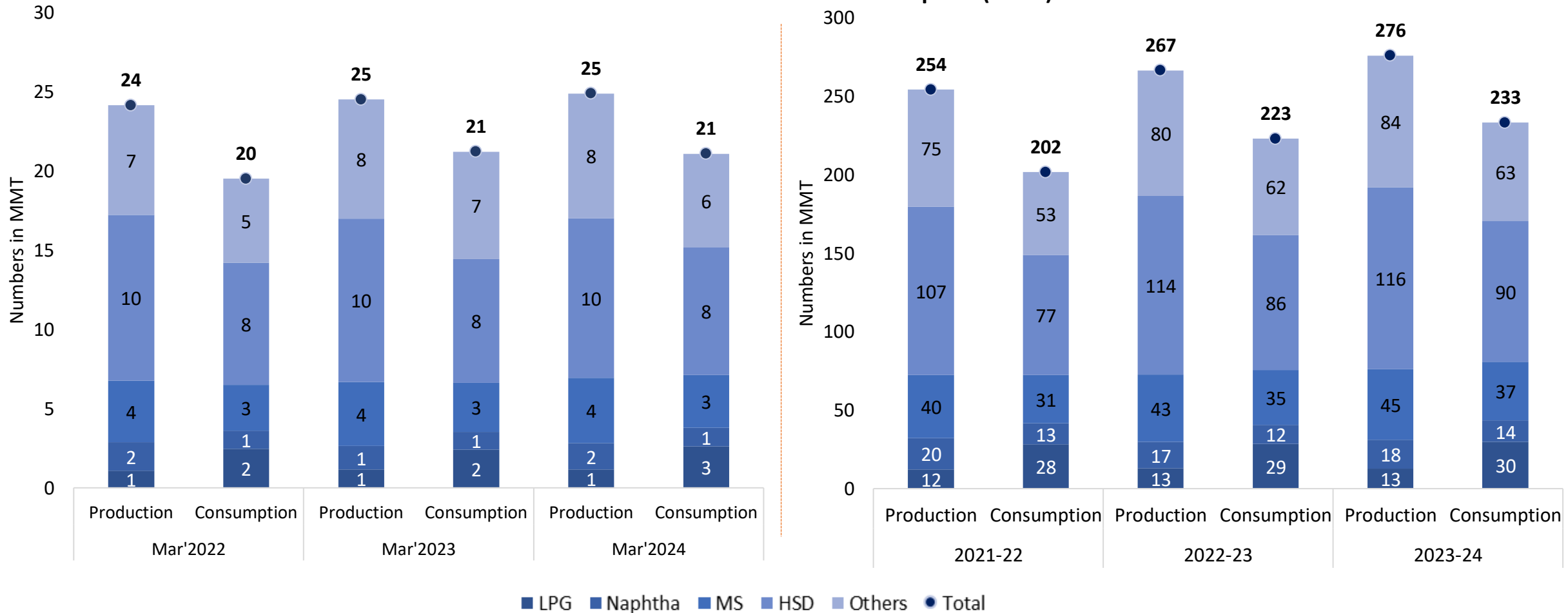
International Coal Prices



Source: Ministry of Coal

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)

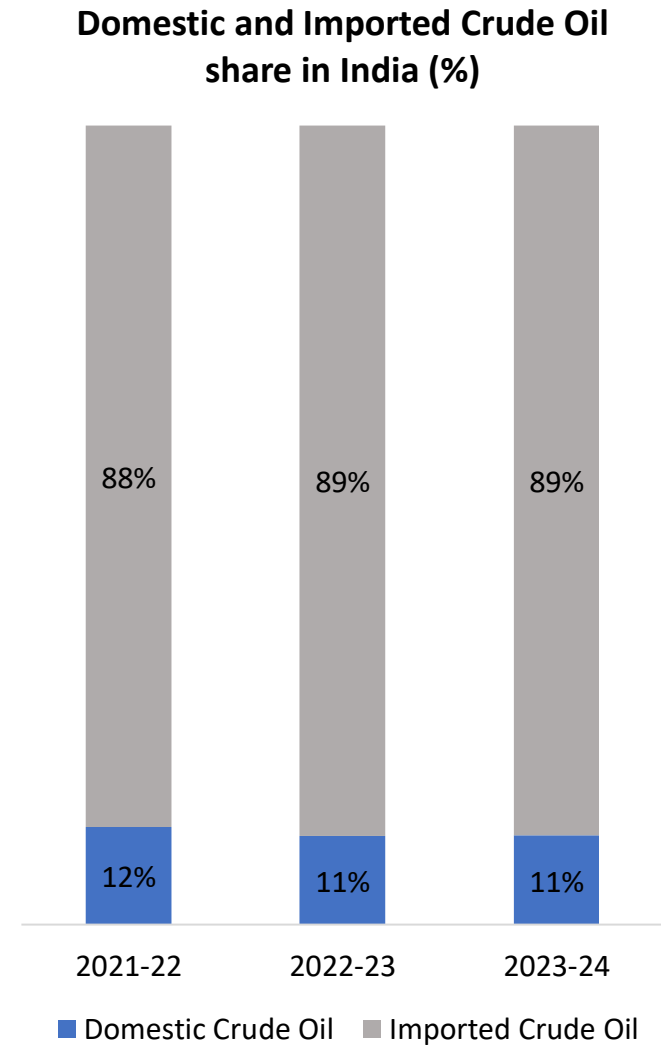
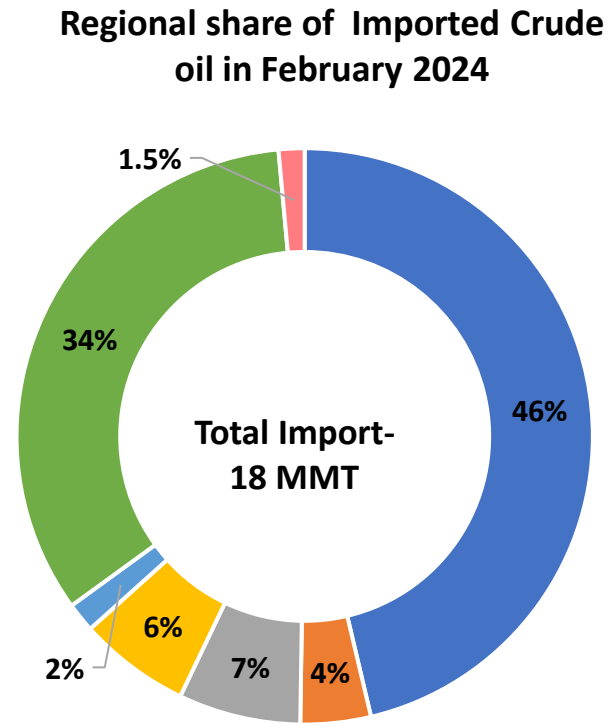
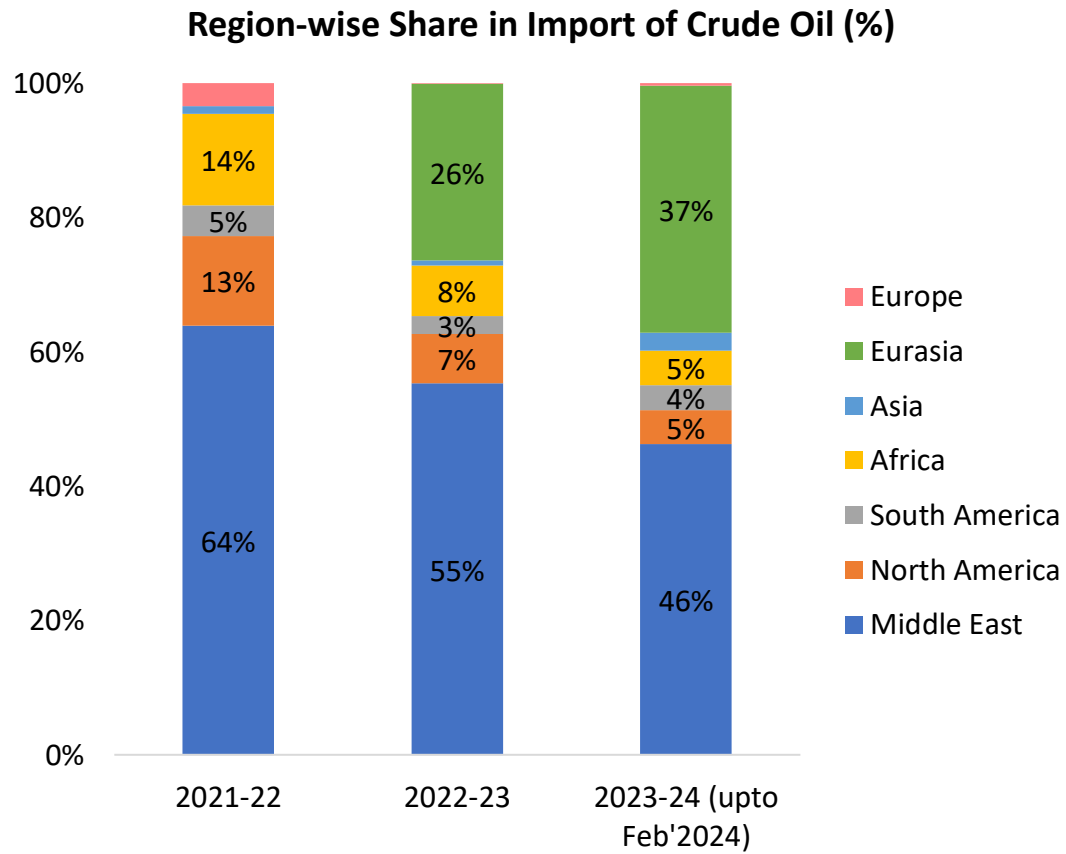
Import/Export of Crude Oil and Petroleum Products ('000 Tonnes)							
Petroleum Products	Import/ Export	Monthly			Yearly		
		Mar'22	Mar'23	Mar'24	2021-22	2022-23	2023-24
Crude Oil	Import	19031	20928	20694	212382	232700	233118
	Export	0	0	0	0	0	0
	Net Import	19031	20928	20694	212382	232700	233118
LPG	Import	1438	1410	1589	17043	18335	18461
	Export	37	52	48	513	540	525
	Net Import	1401	1359	1541	16530	17796	17936
Diesel	Import	5	4	4	43	322	35
	Export	3365	2483	2433	32407	28494	28193
	Net Import	-3360	-2479	-2429	-32364	-28172	-28158
Petrol	Import	0	0	0	671	1069	717
	Export	1600	1508	1338	13482	13127	13461
	Net Import	-1600	-1508	-1338	-12812	-12058	-12743
Others	Import	2227	2938	2240	21259	24871	28701
	Export	1741	2003	1840	16352	18854	20258
	Net Import	486	935	400	4907	6017	8444

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

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

Source: PPAC

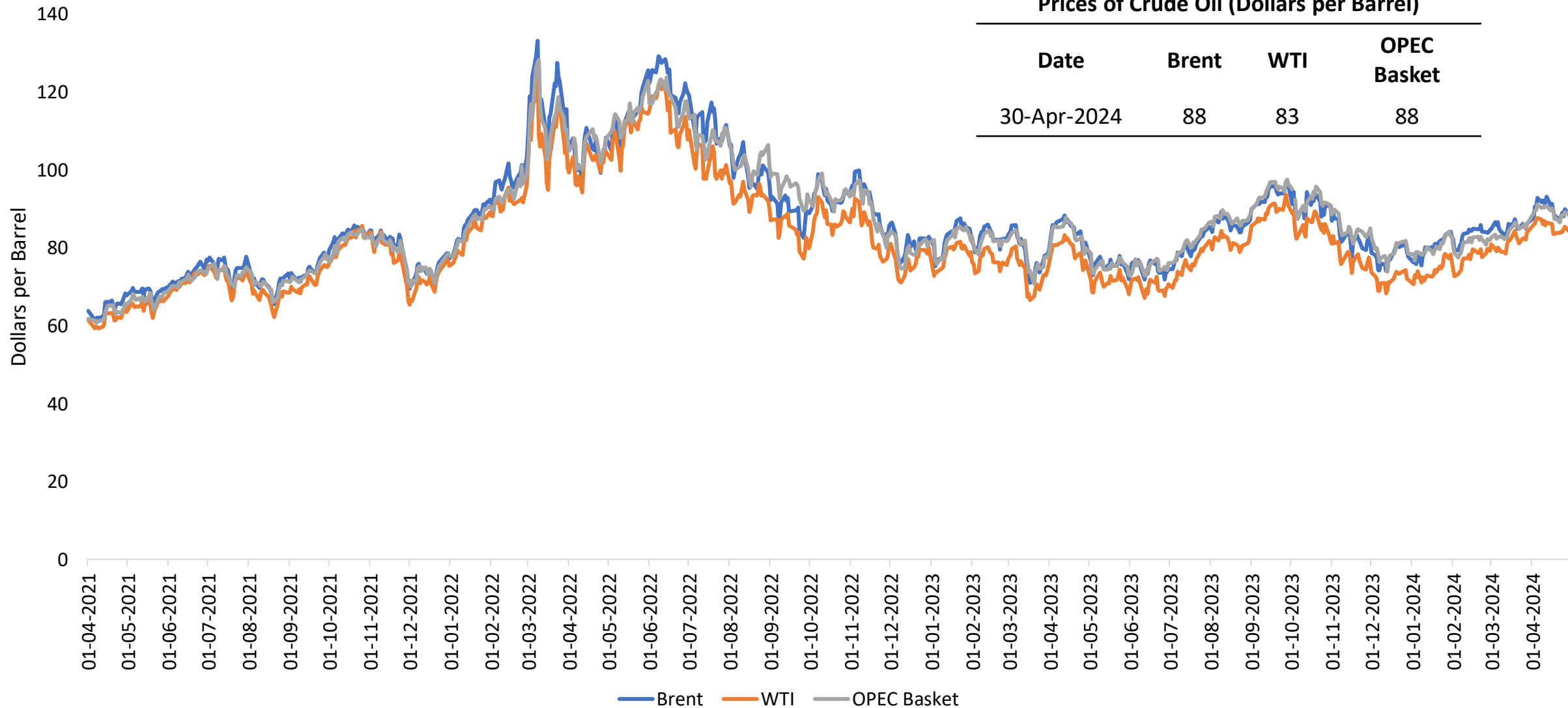
Petroleum Products Market Scenario (3/3)



Total Import of Crude Oil (MMT)			
Total Import	2021-22	2022-23	2023-24
Crude Oil	212	233	233

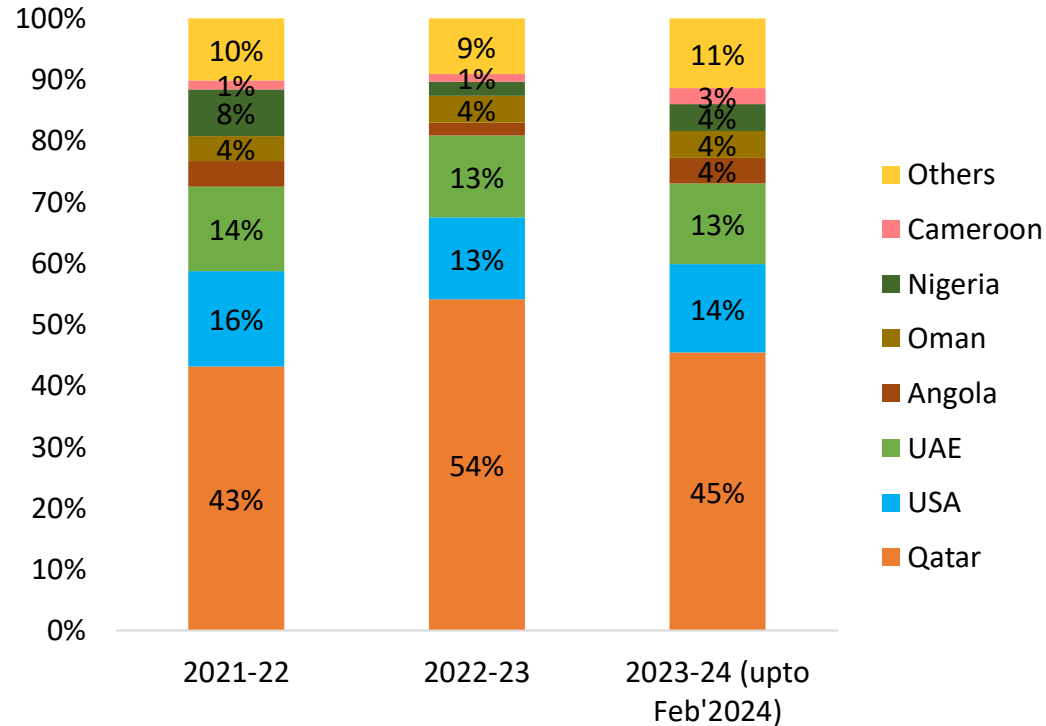
Daily Prices of Crude Oil

Daily Prices of Crude Oil

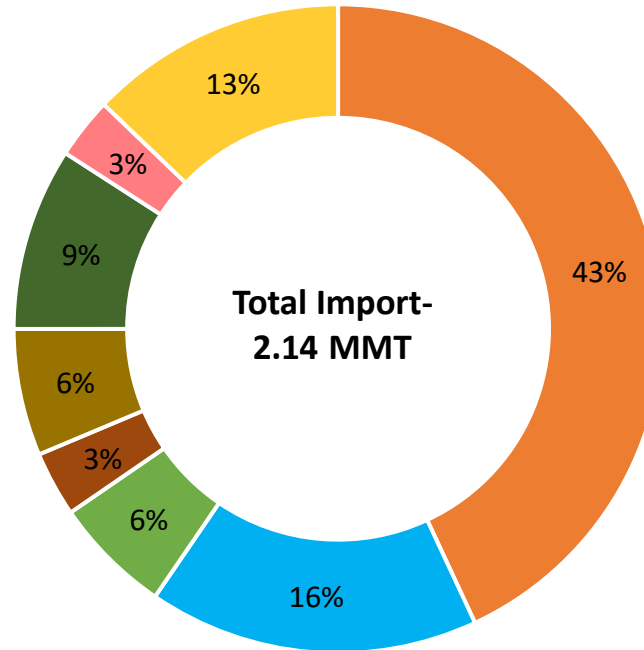


Gas Market Scenario

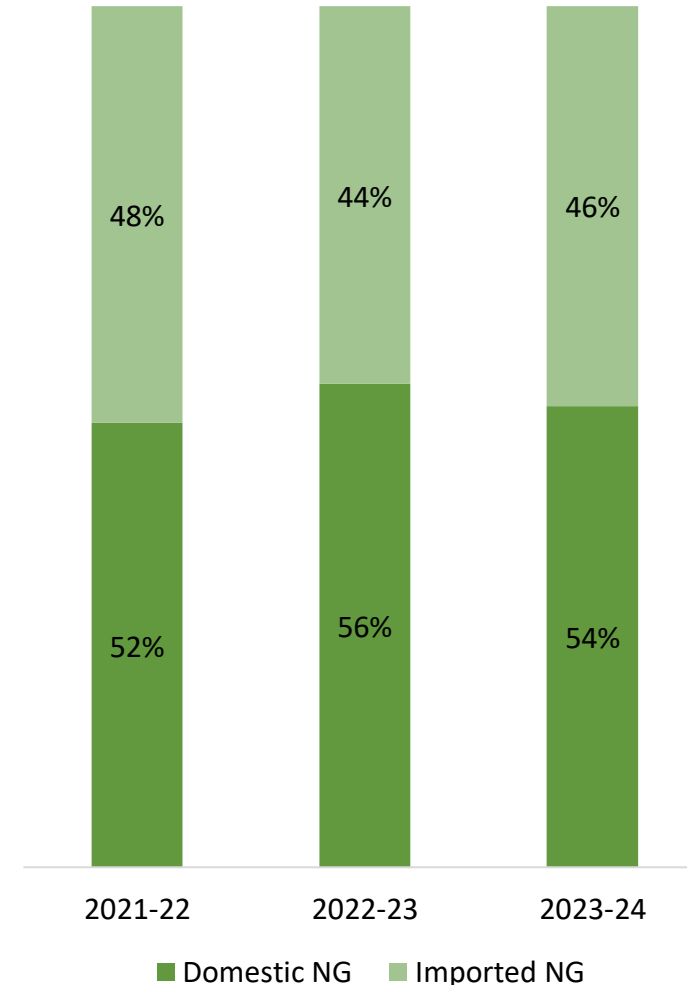
Region-wise Share in Import of LNG (%)



Country Share of Imported LNG in February'2024



Domestic and Imported Natural Gas share in India (%)



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

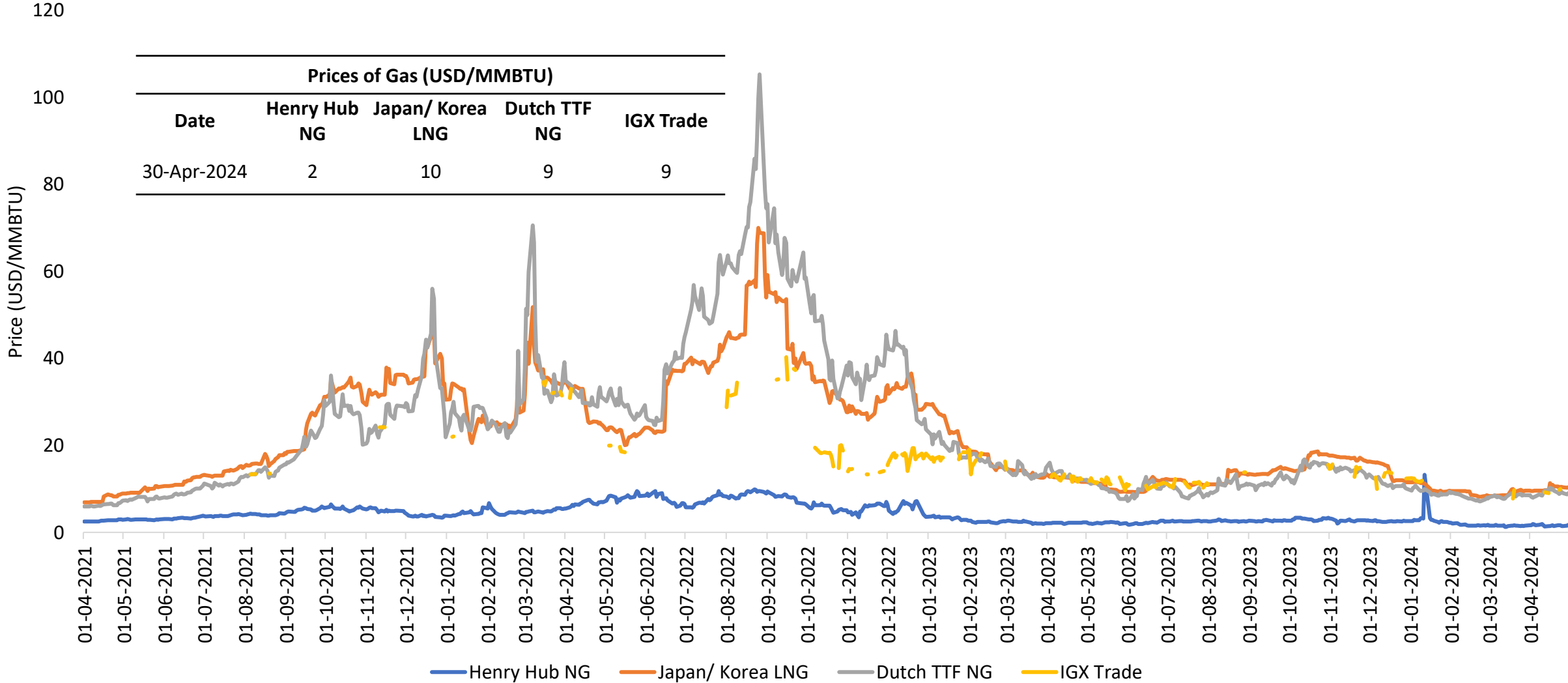
Total Import of Liquefied Natural Gas (LNG) (MMT)			
Total Import	2021-22	2022-23	2023-24
LNG	23.42	19.85	23.33

NOTE: The data is latest available

Source: MoCI and PPAC

Daily Prices of Gas

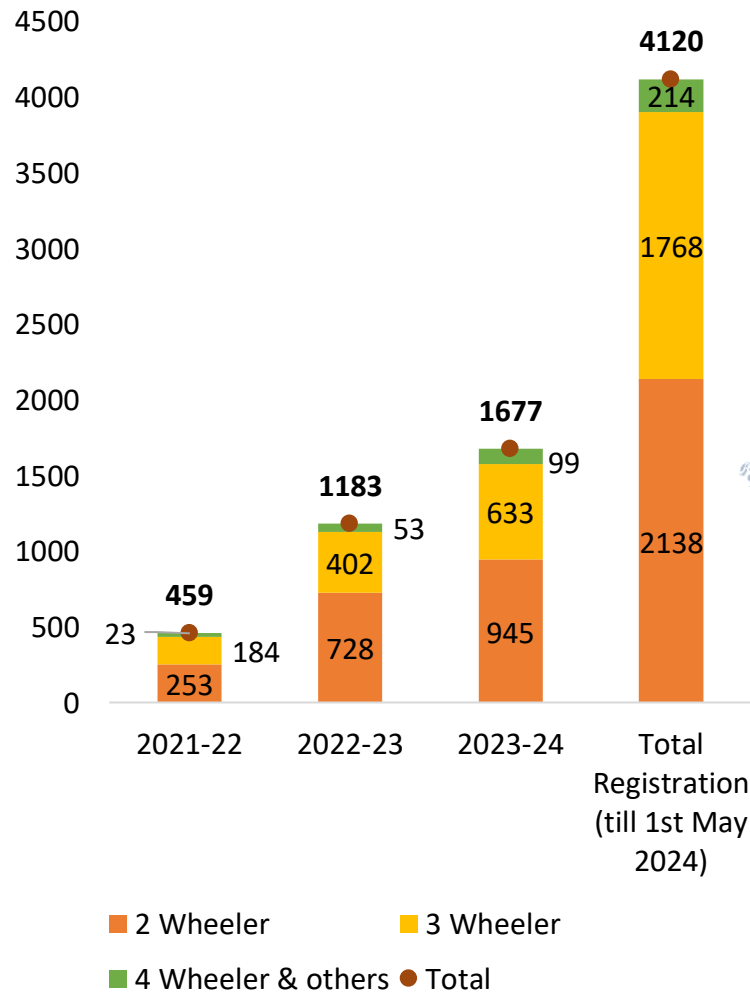
Gas Daily Market Price



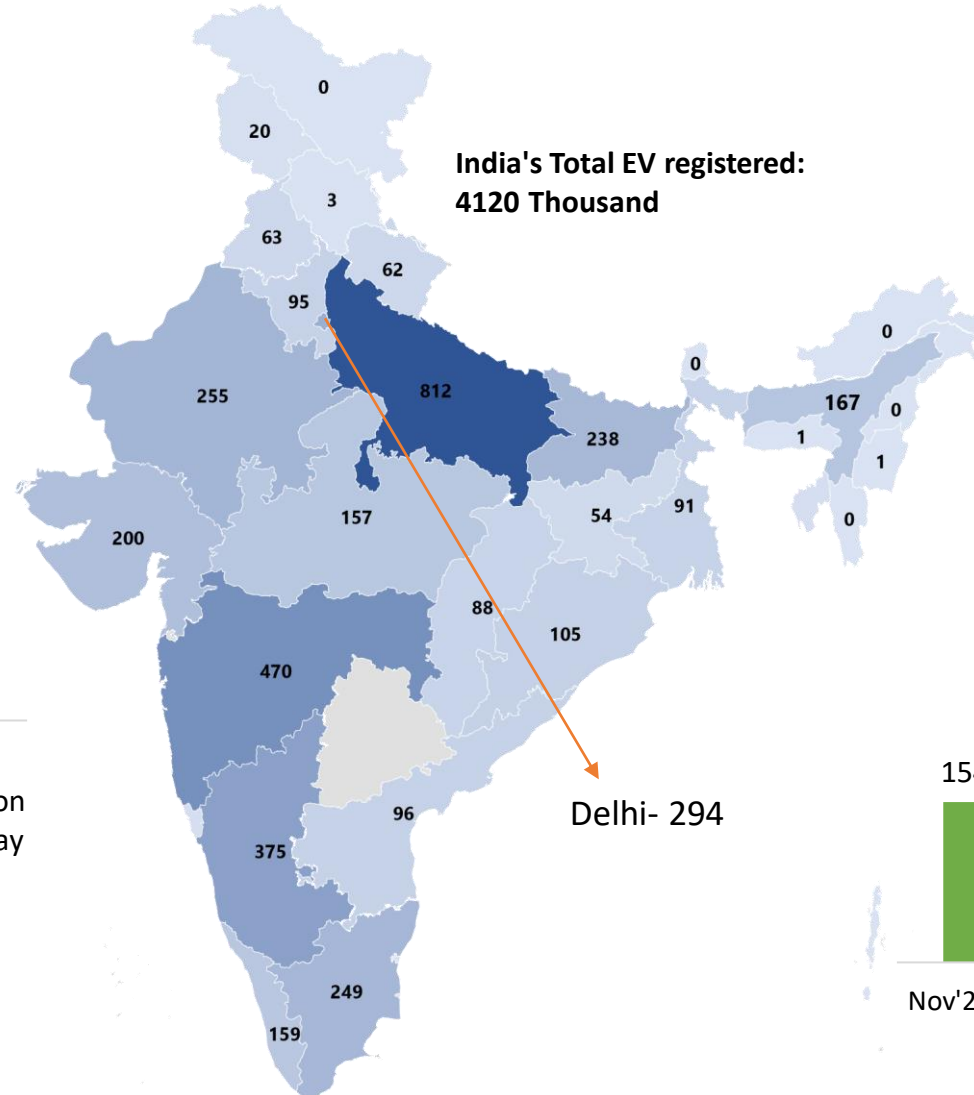
MMBTU- Million Metric British Thermal Unit

Status of Electric Mobility in India

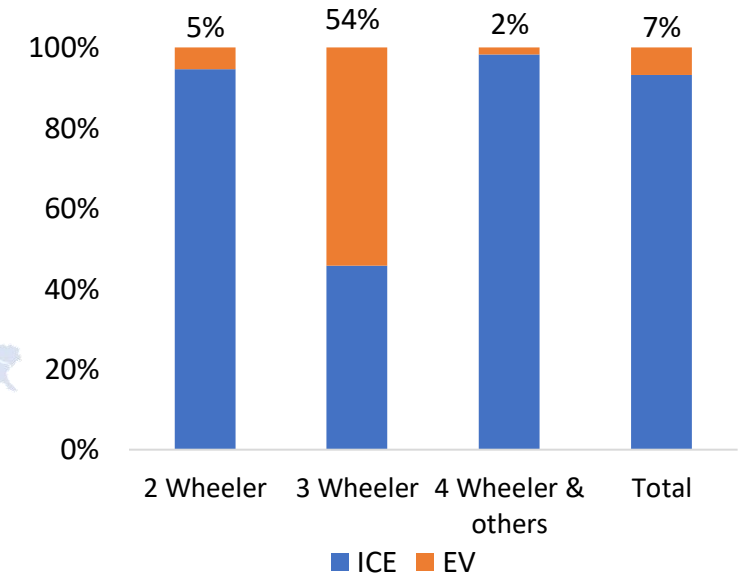
National EV registration (in Thousands)



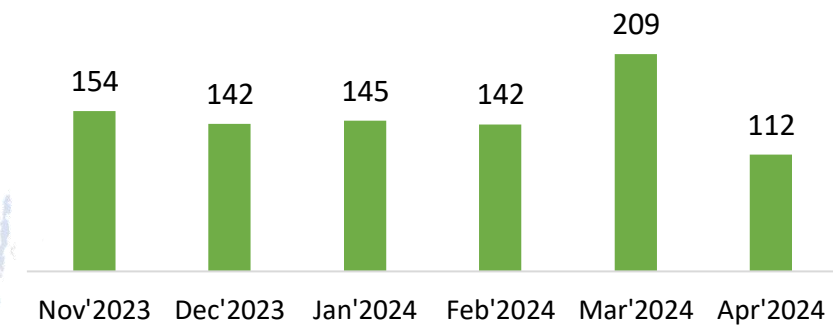
Cumulative State-wise EV registration as on 1st May 2024 (in Thousands)



EV and ICE sale composition in 2023-24



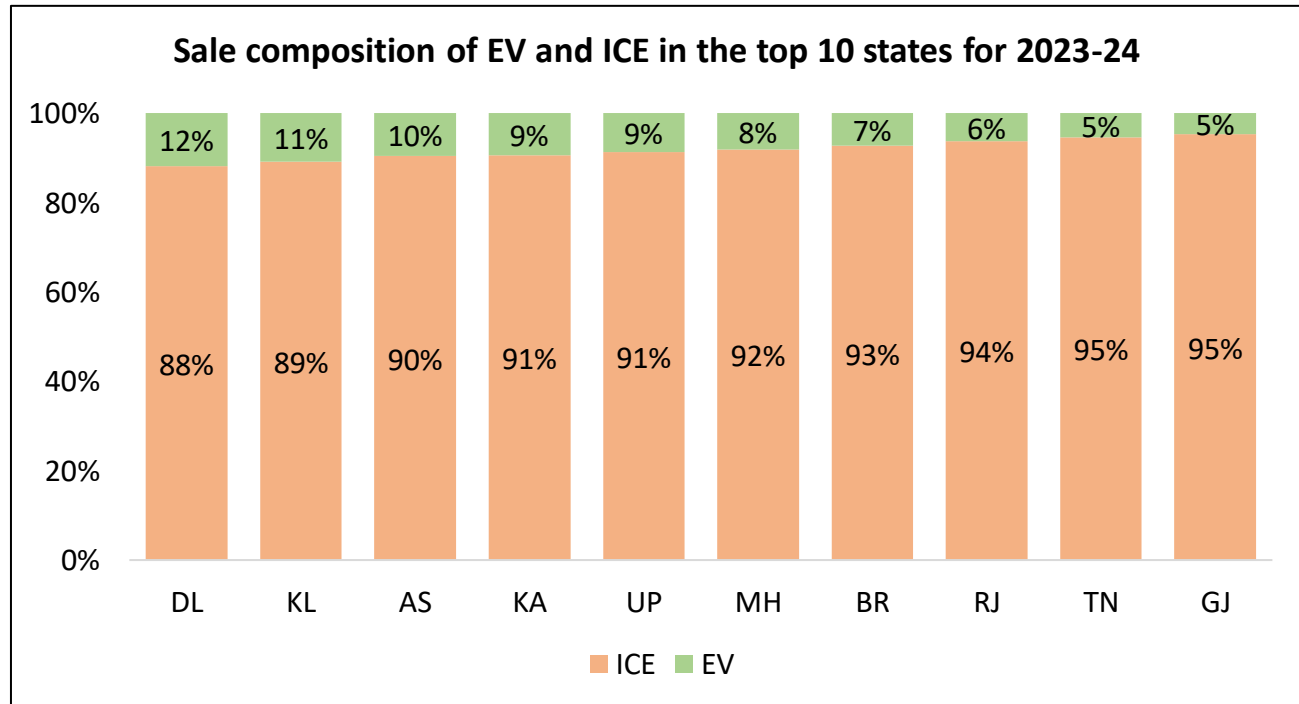
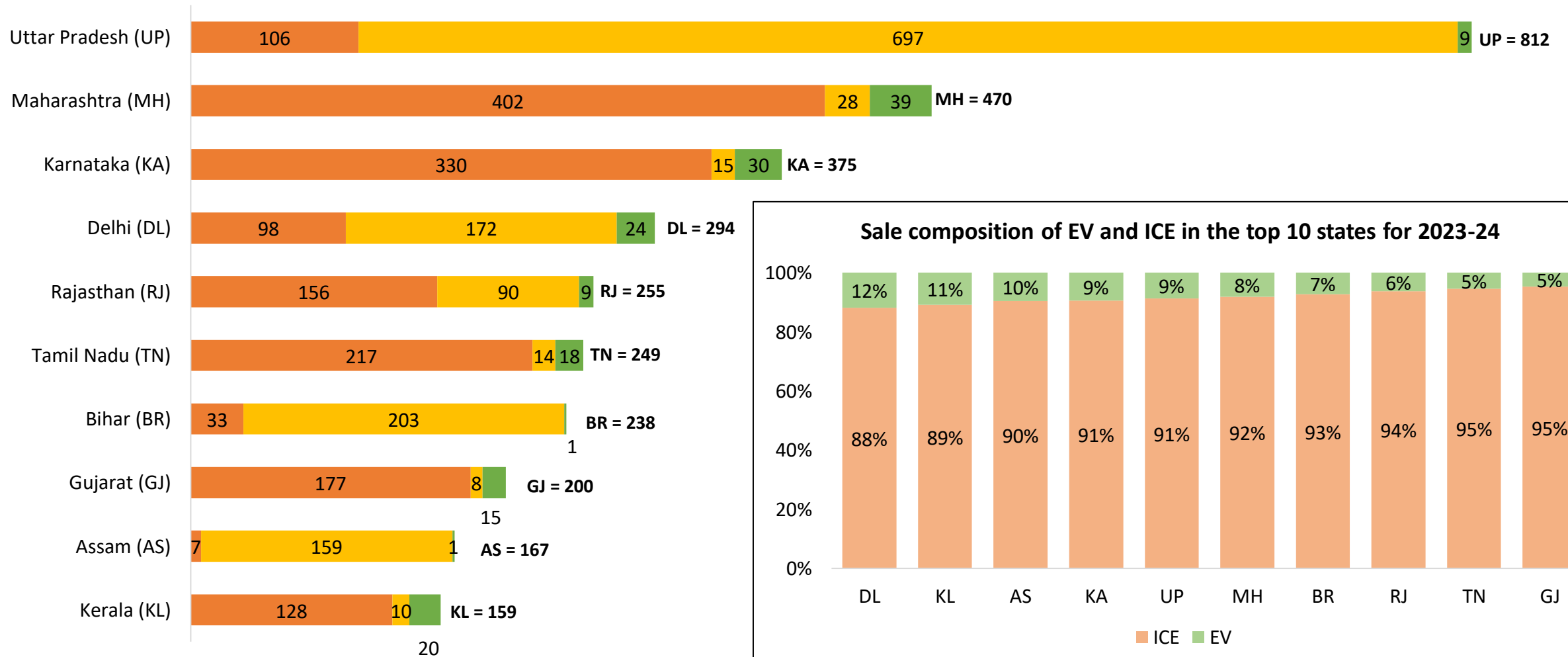
Provisional Monthly EV registered (in Thousands)



Source: VAHAN Dashboard

Status of Electric Mobility in India

**Top 10 States for Electric Vehicles (in Thousands)
as on 1st May 2024**



2 Wheeler 3 Wheeler 4 Wheeler & others

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 April 2024

- The Ministry of New and Renewable Energy (MNRE) has [extended the deadline for submission of proposals under R&D Scheme for Green Hydrogen from 12th April 2024 to 12th May 2024.](#)
- The Ministry of New and Renewable Energy has released [the draft guidelines for implementation of PM-Surya Ghar: Muft Bijli Yojana for the component of Central Financial Assistance Component](#) in the residential sector.
- The Ministry of Power has issued [directions to all Gas-Based Generating Stations under Section 11 of the Electricity Act, 2003](#), to ensure maximum power generation from these plants. The order aims to optimize the availability of power from gas-based generating stations during this high-demand period. This measure is intended to help meet the high electricity demand in the country during the summer season, and it will remain valid for the generation and supply of power from 1st May 2024, to 30th June 2024.
- The Ministry of Power has [constituted an independent Thermal Project Monitoring Group \(TPMG\) for the monitoring the execution of Thermal Power Projects that are under implementation.](#) This group has been constituted to conduct site inspections and provide detailed report outlining the findings of the site visit and progress review of each site of the Thermal Power Project under implementation by a Central/State utility and IPPs. The report shall also include the latest photographs of the critical areas and achievements.



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