

India's Energy Overview

OCTOBER 2022



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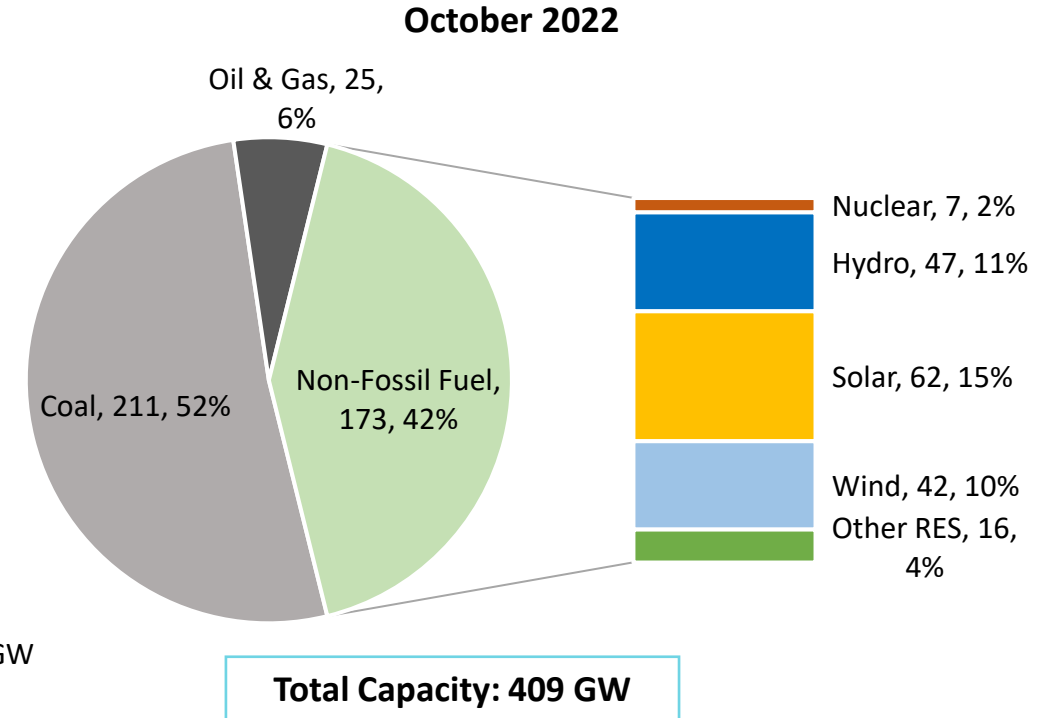
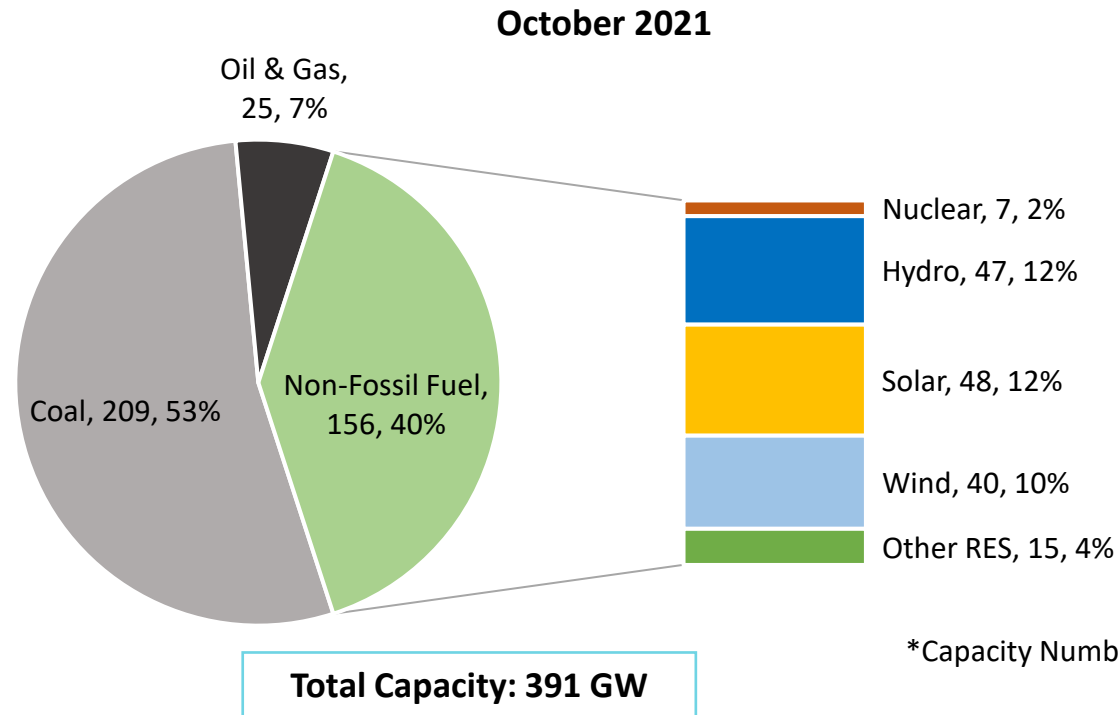
Recent Interventions to promote Renewable Energy



Key Highlights or Announcements of October 2022



India's Electricity Capacity Mix (1/2)

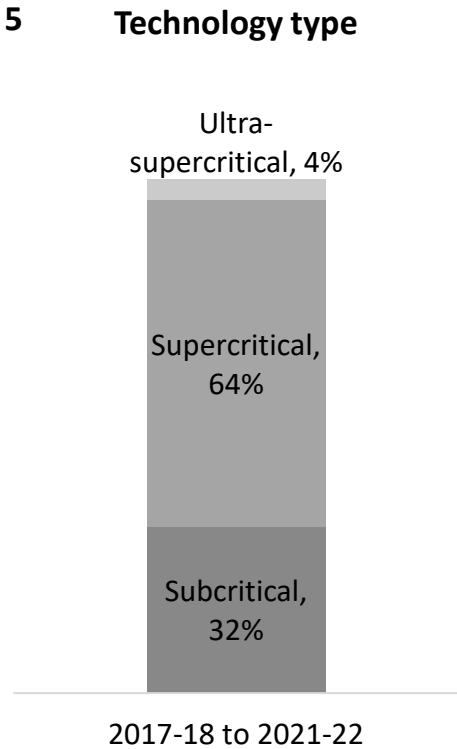
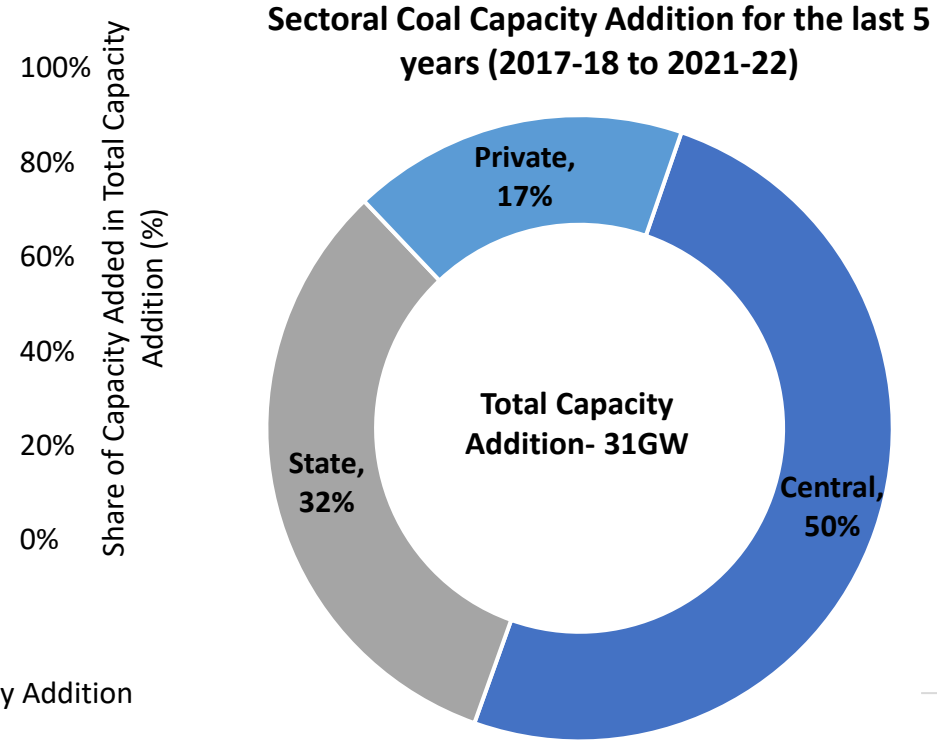
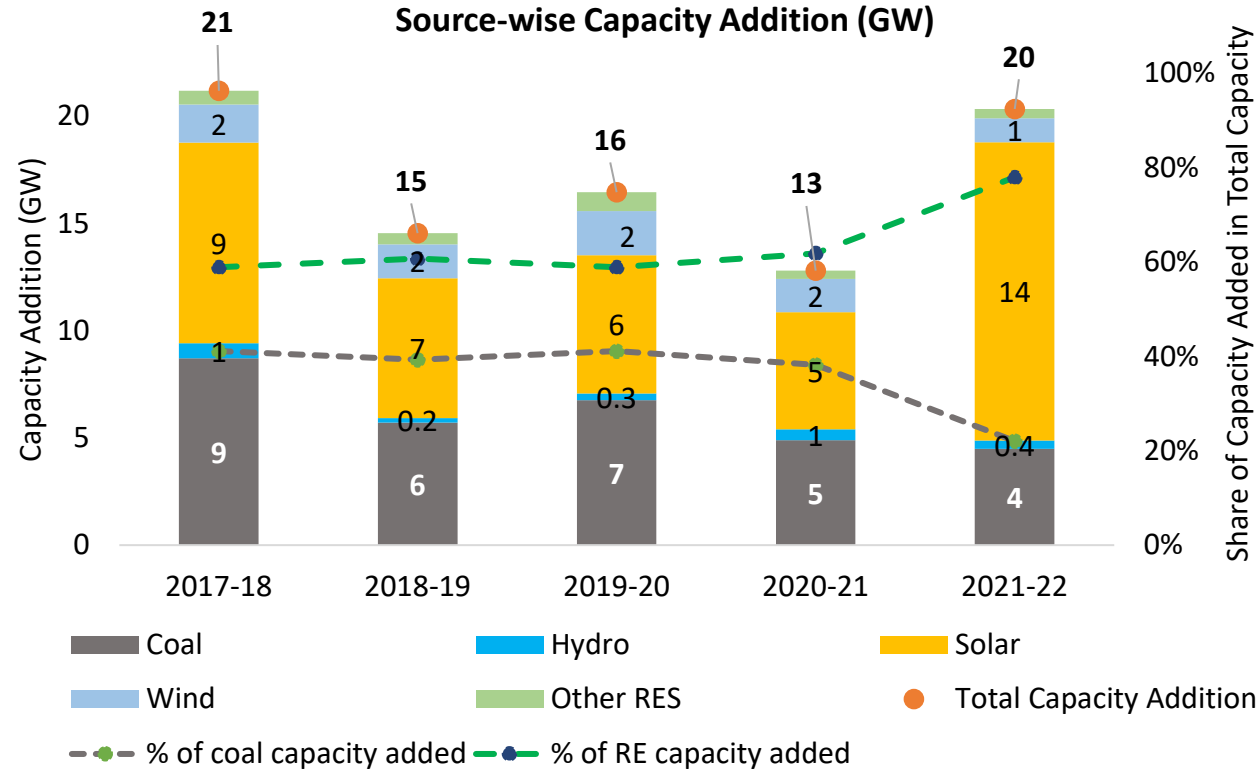


*Capacity Numbers are in GW

- India's electricity generating capacity is 409 GW as on Oct-2022. Major contributors to the capacity are coal 211 GW (52%), solar 62 GW (15%), hydro 47 GW (11%), and wind 42 GW (10%).
- Non-fossil fuel's generating capacity has increased from 156 GW to 173 GW since Oct-2021, a jump of 10%. Major capacity addition was in solar technology followed by wind.
- As on Oct-2022, India's renewable energy capacity (including large hydro) stood at 166 GW.



Source-wise Capacity Addition in last 5 years (2/2)

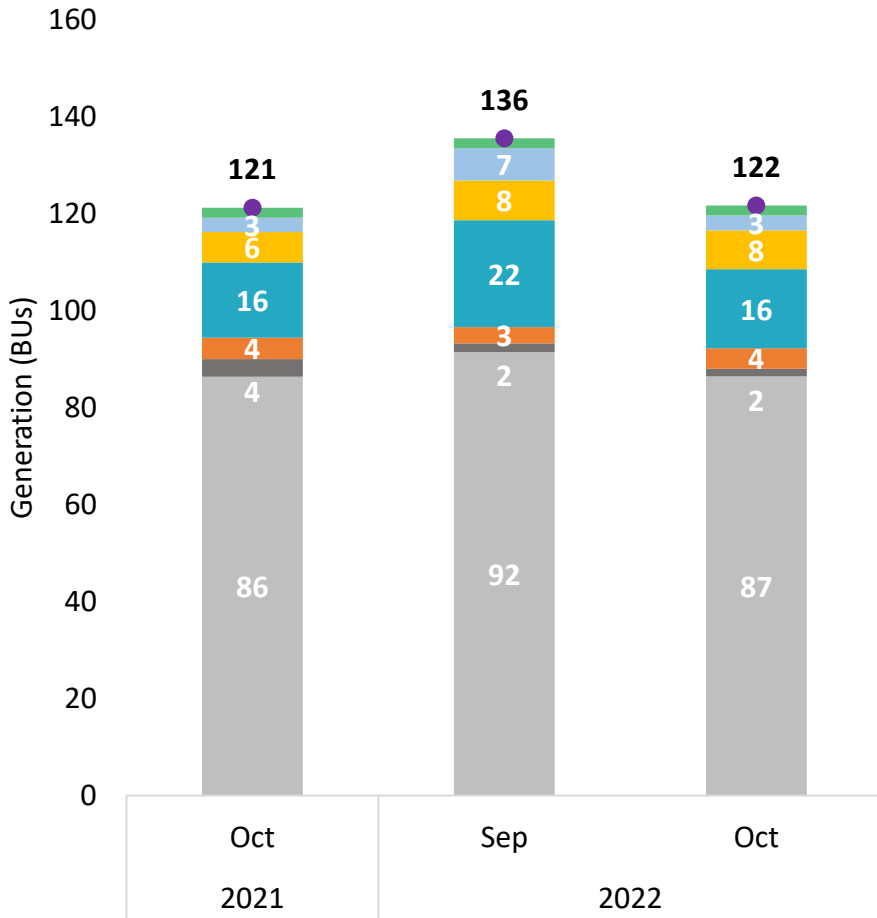


- A total of 55 GW of generation capacity has been added in RE (Hydro, solar, wind, and other) over the past 5 years, whereas the coal capacity addition during the same period was 31 GW, mostly in the central sector (50%).
- The share of RE addition in total capacity addition is increasing over the years (from 59% in 2017 to 78% in 2022).
- Since Apr-2017, there has been no capacity addition in nuclear power.

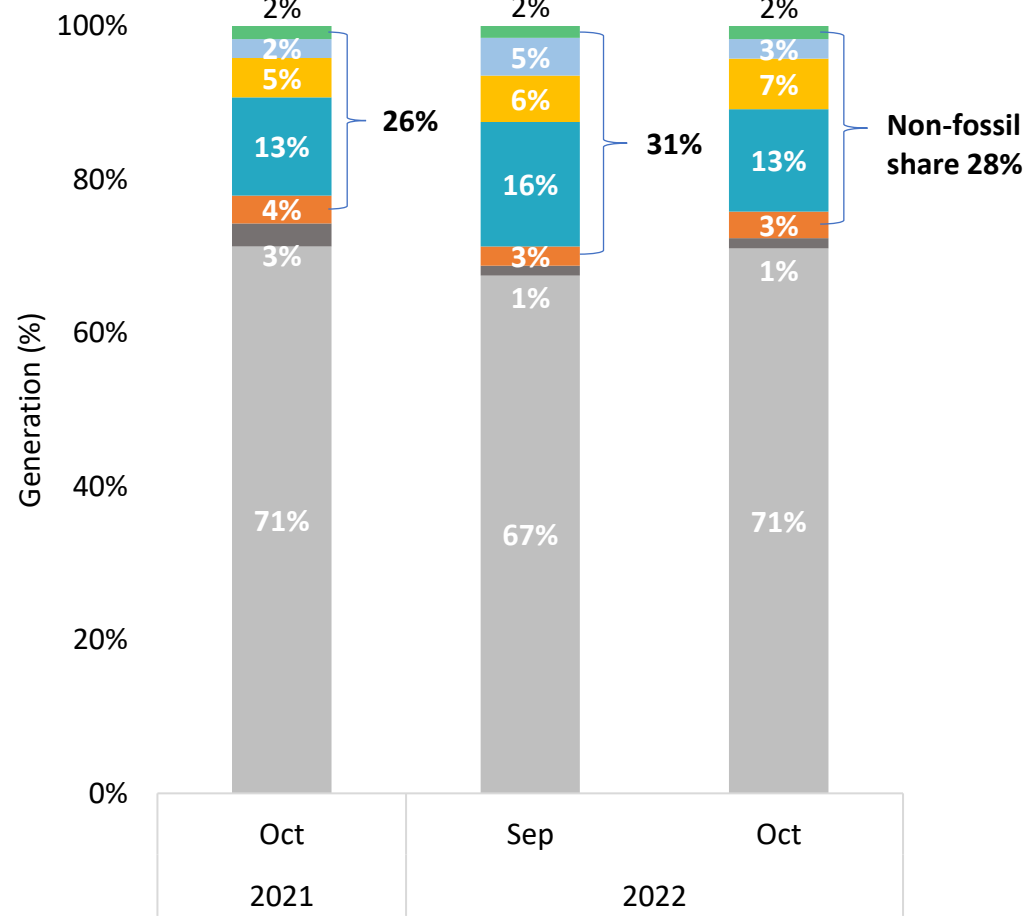


India's Electricity Generation Mix

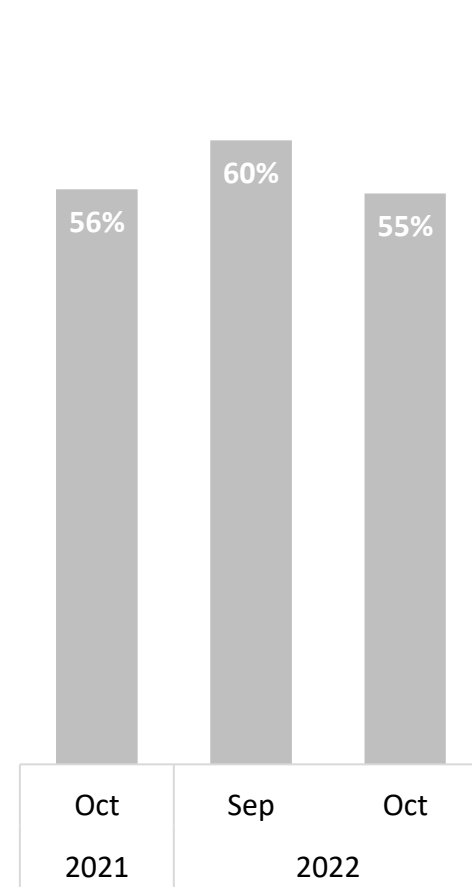
Source-wise Generation Mix (BU)



Source-wise Generation Mix (%)



Average Monthly PLF of Coal Plants (%)



Coal
 Oil & Gas
 Nuclear
 Hydro
 Solar
 Wind
 Other RES
 All India

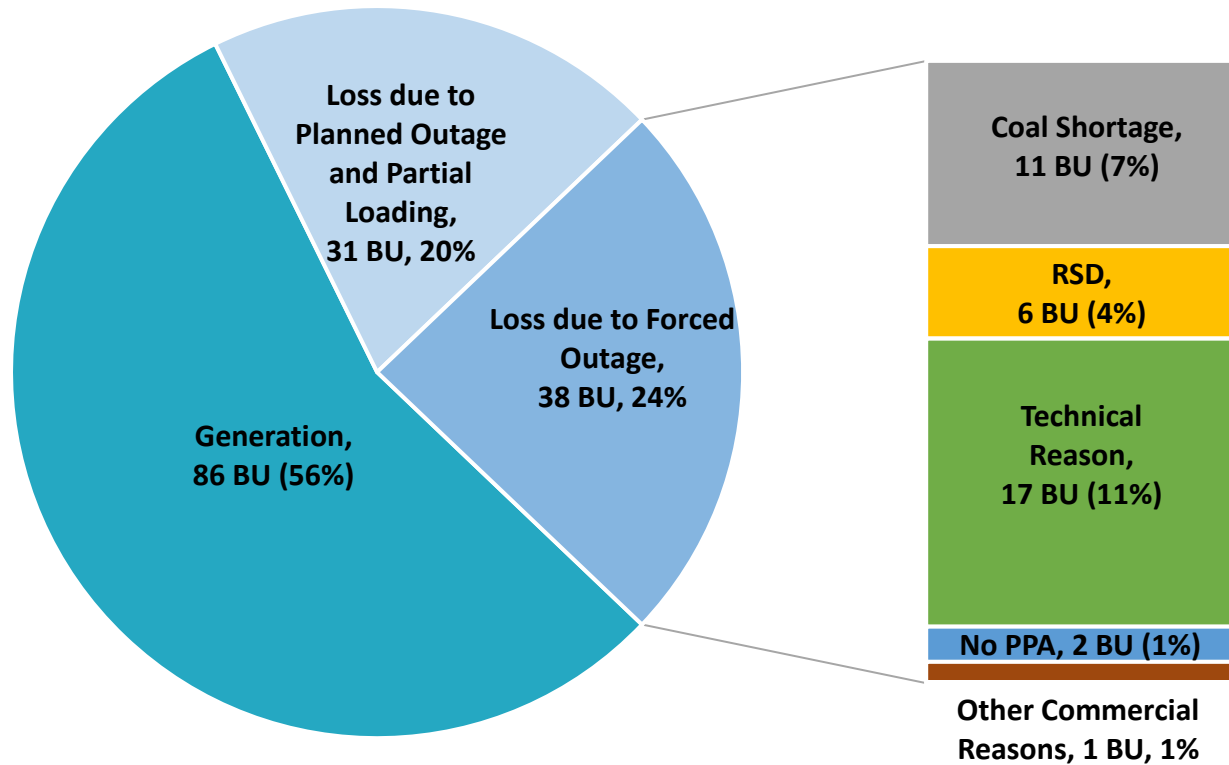
Sources: CEA
 PLF: Plant Load Factor BU- Billion Units
 Note: Oct-2022 numbers are provisional.



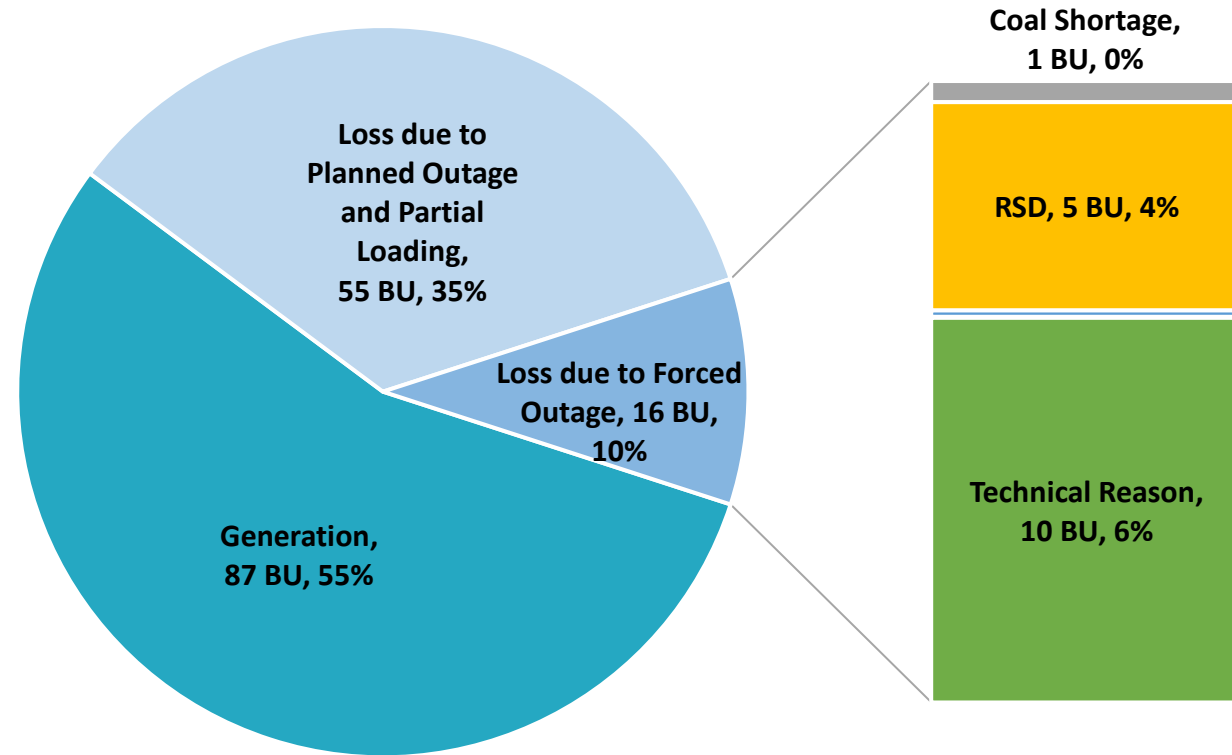


Coal Generation Loss and Reasons for Forced Outages

October 2021



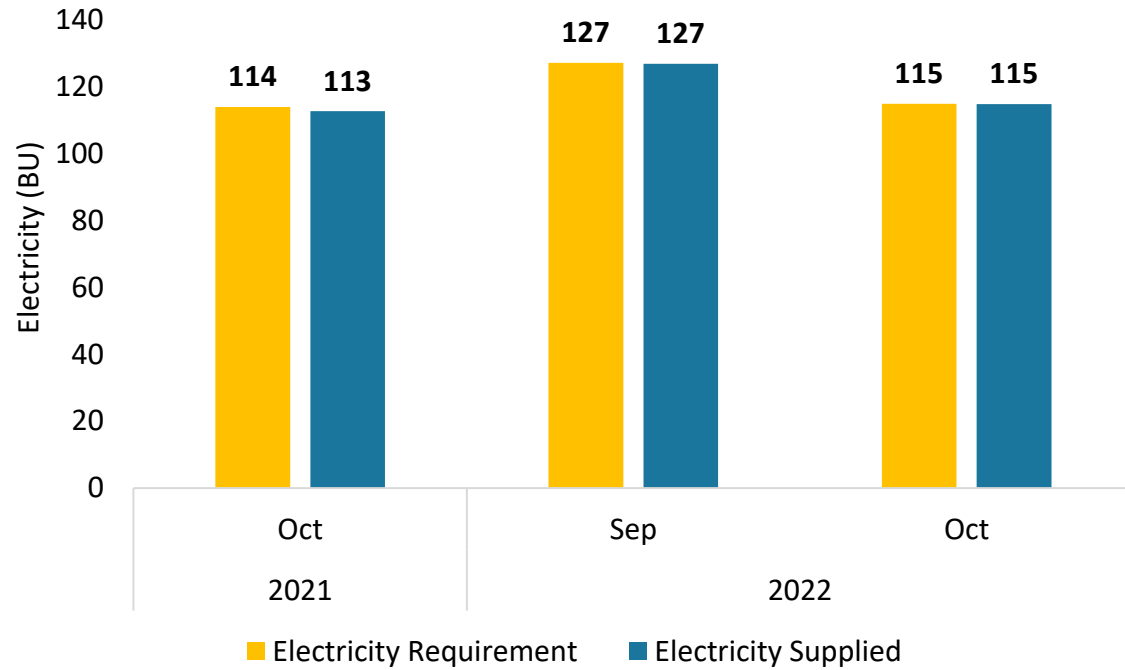
October 2022



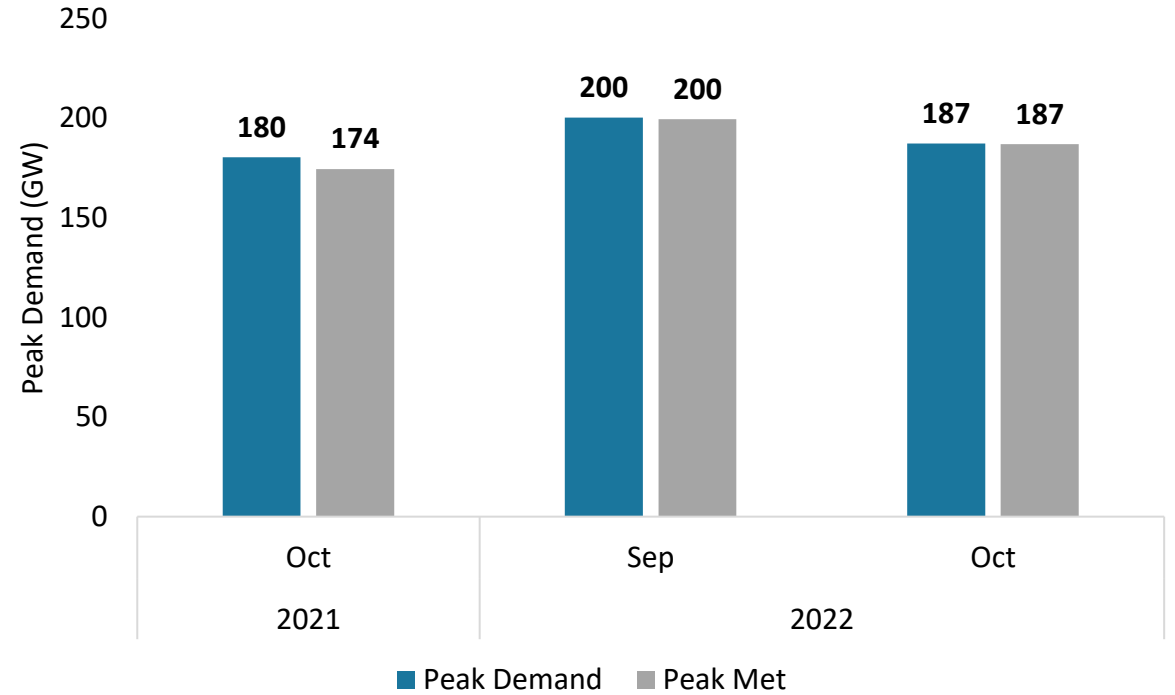


India's Electricity Demand & Supply Position

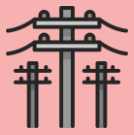
Electricity Supply Position



Peak Demand Position

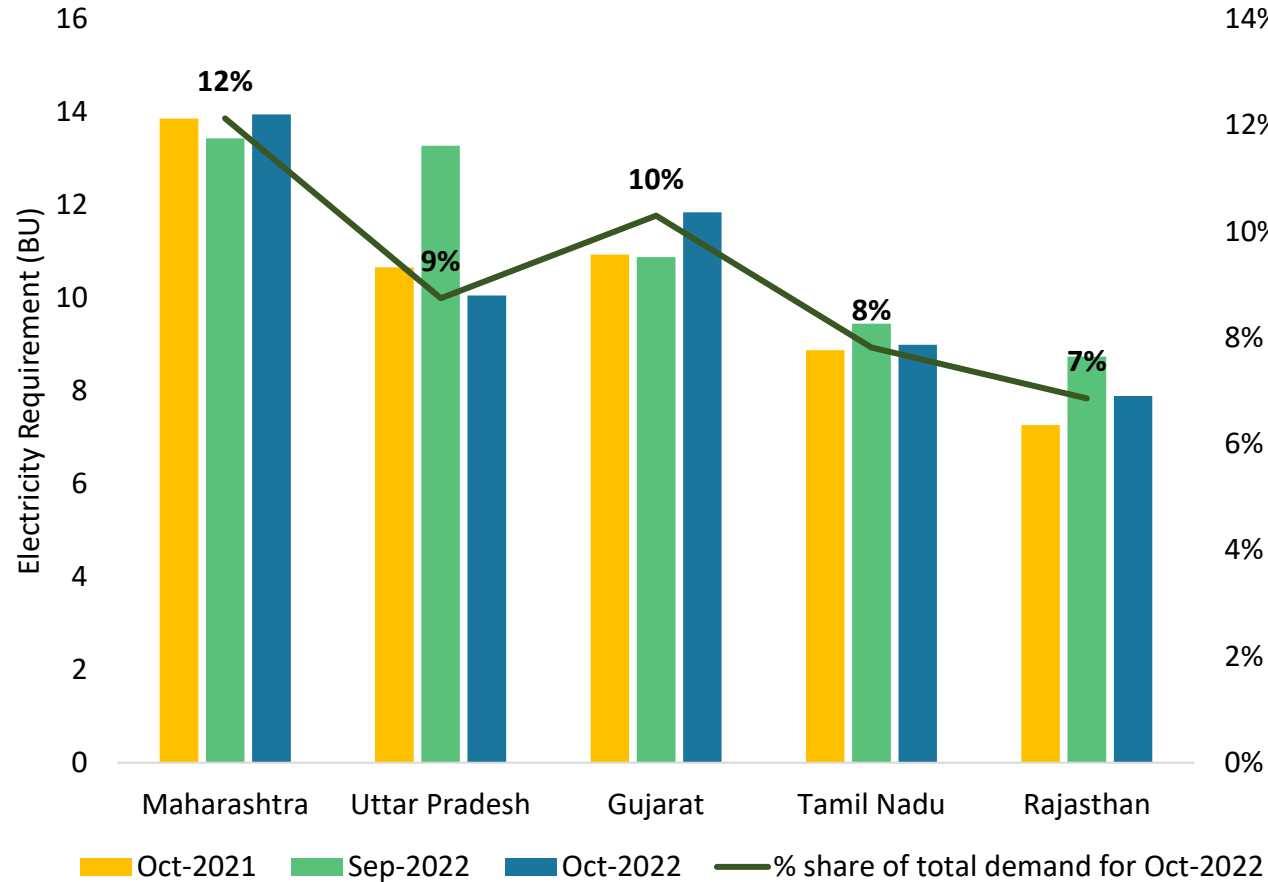


- National electricity demand in Oct-2022 increased by 1%, compared to the demand in Oct-2021.
- National peak electricity demand in Oct-2022 has increased by 4% as compared to the peak demand in Oct-2021.
- The peak demand deficit in Oct-2022 has decreased from 3.2% (Oct-2021) to 0.2%.

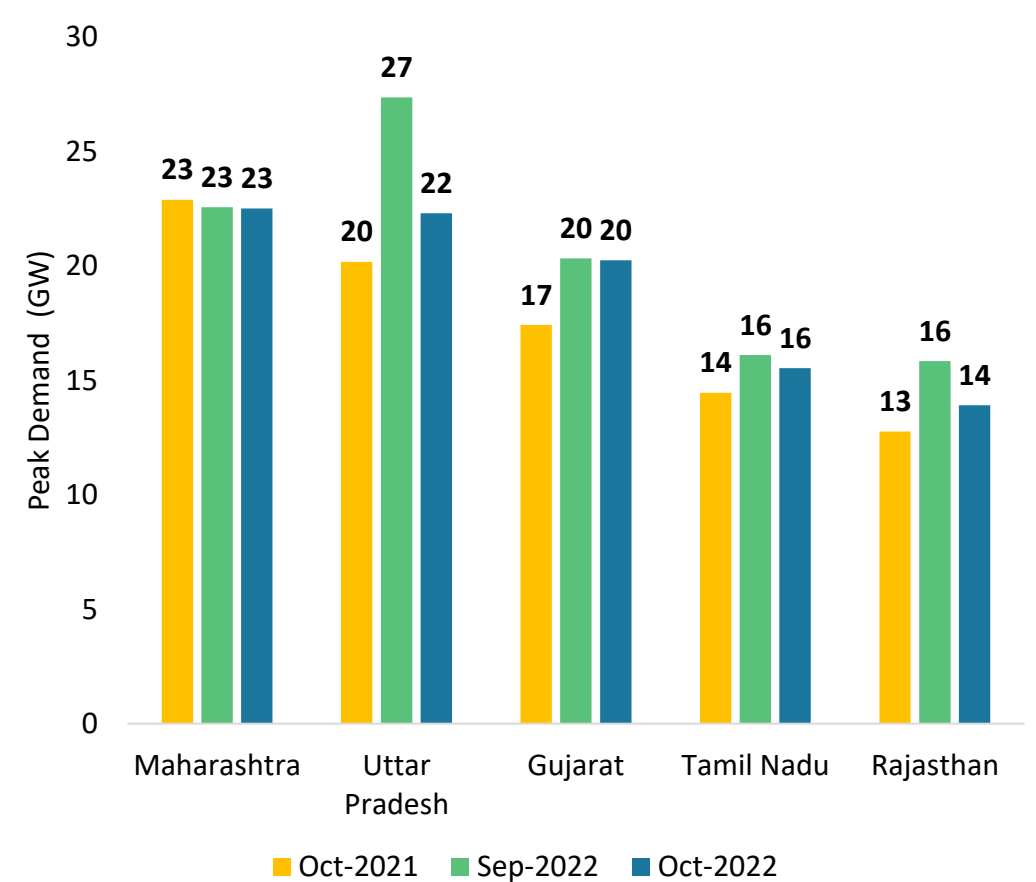


Monthly Electricity Demand of the top 5 states (1/3)

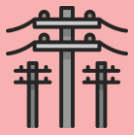
State with Highest Monthly Electricity Requirement



Monthly Peak Demand of top 5 states

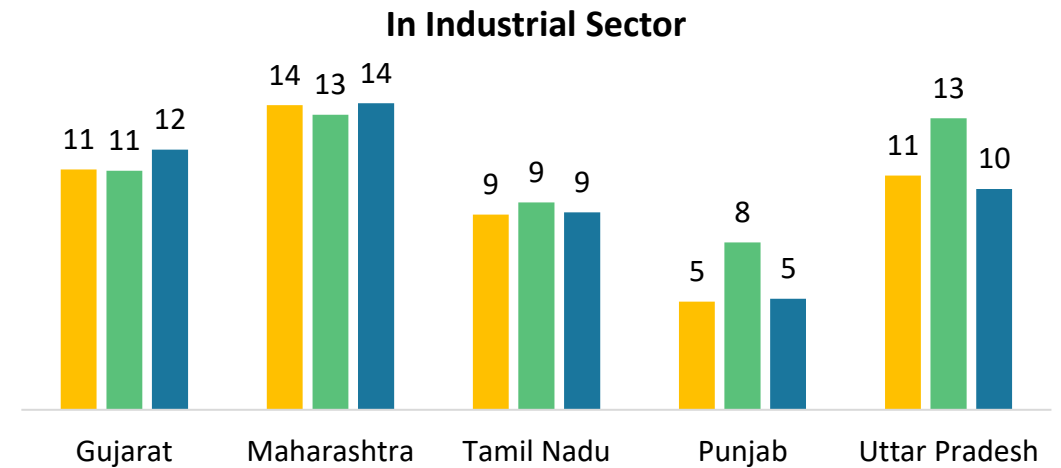
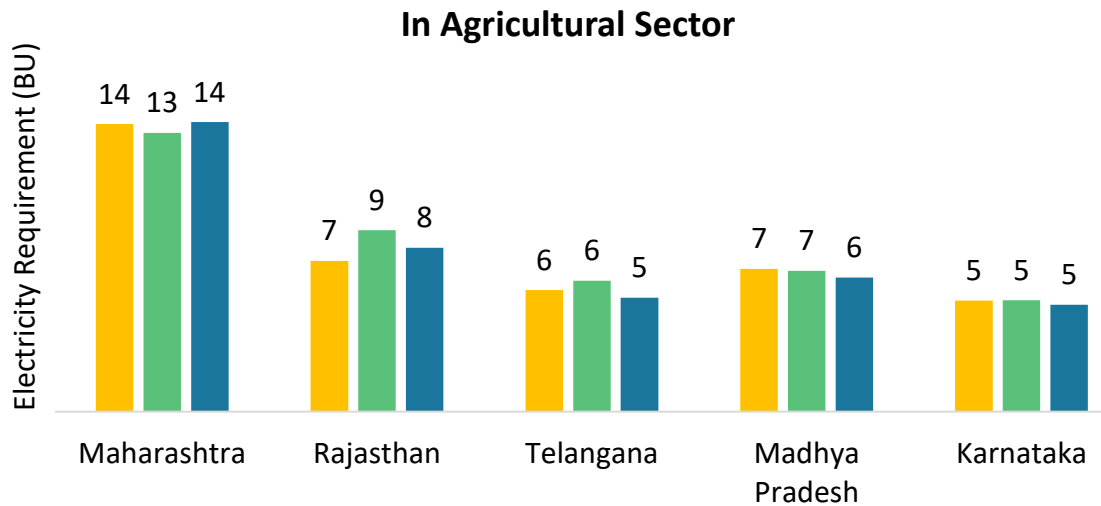
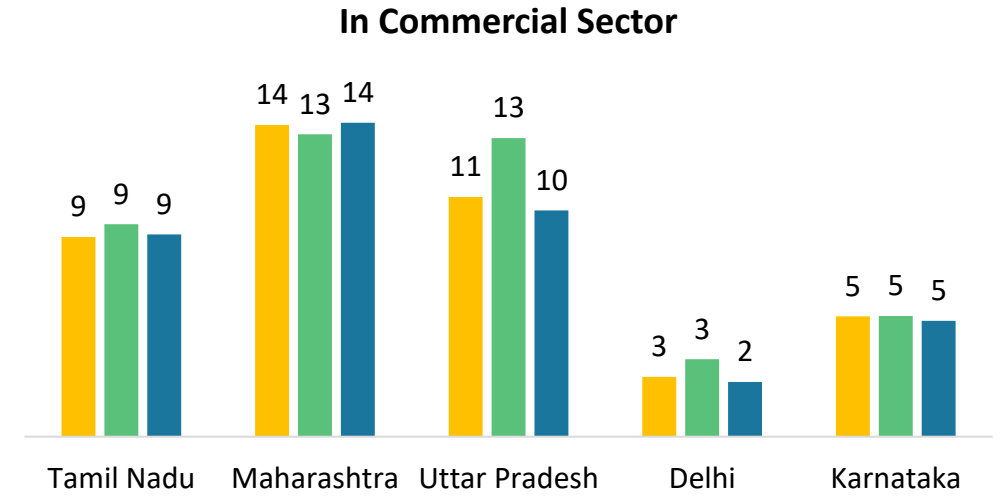
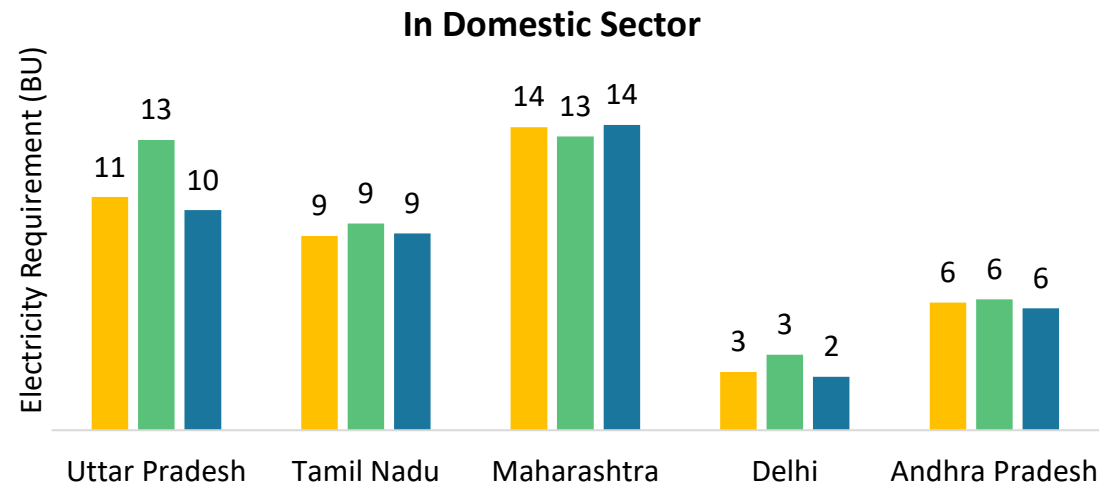


The top 5 states collectively account for a 46% share of India's total electricity requirement (115 BU).



Monthly Electricity Demand of the top 5 states (2/3)

States have been selected on the basis highest electricity consumption in the sector

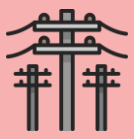


■ Oct-2021 ■ Sep-2022 ■ Oct-2022

Sources: CEA and POSOCO

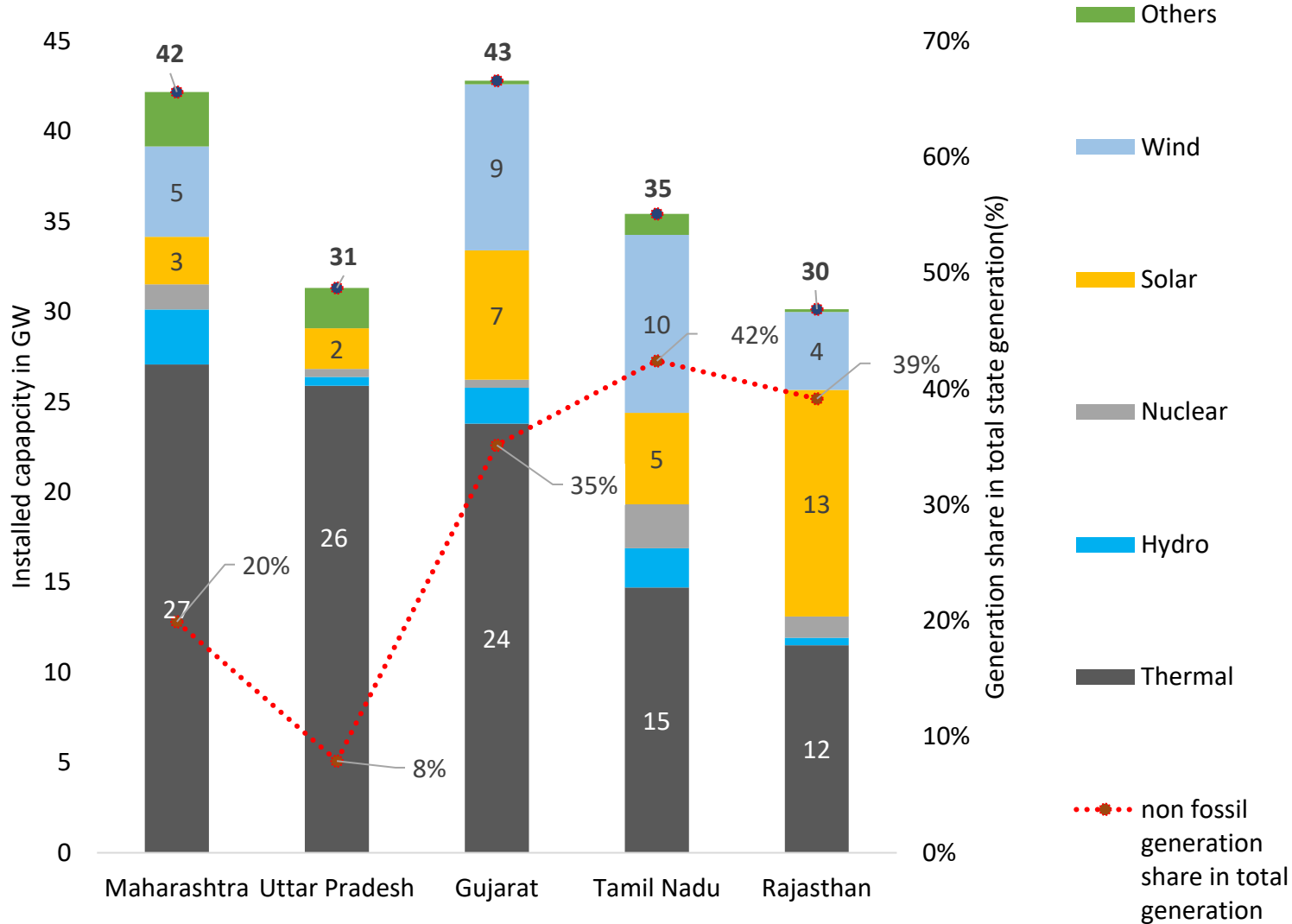
Notes: 1. Top 5 states under sectors are selected based on trued-up sectoral electricity sales in FY20 mentioned in the state tariff orders. However, the numbers presented in the graphs are total monthly electricity sales as sector-specific monthly electricity consumption numbers are not available for the current financial year.

2. Oct-2022 numbers are provisional.

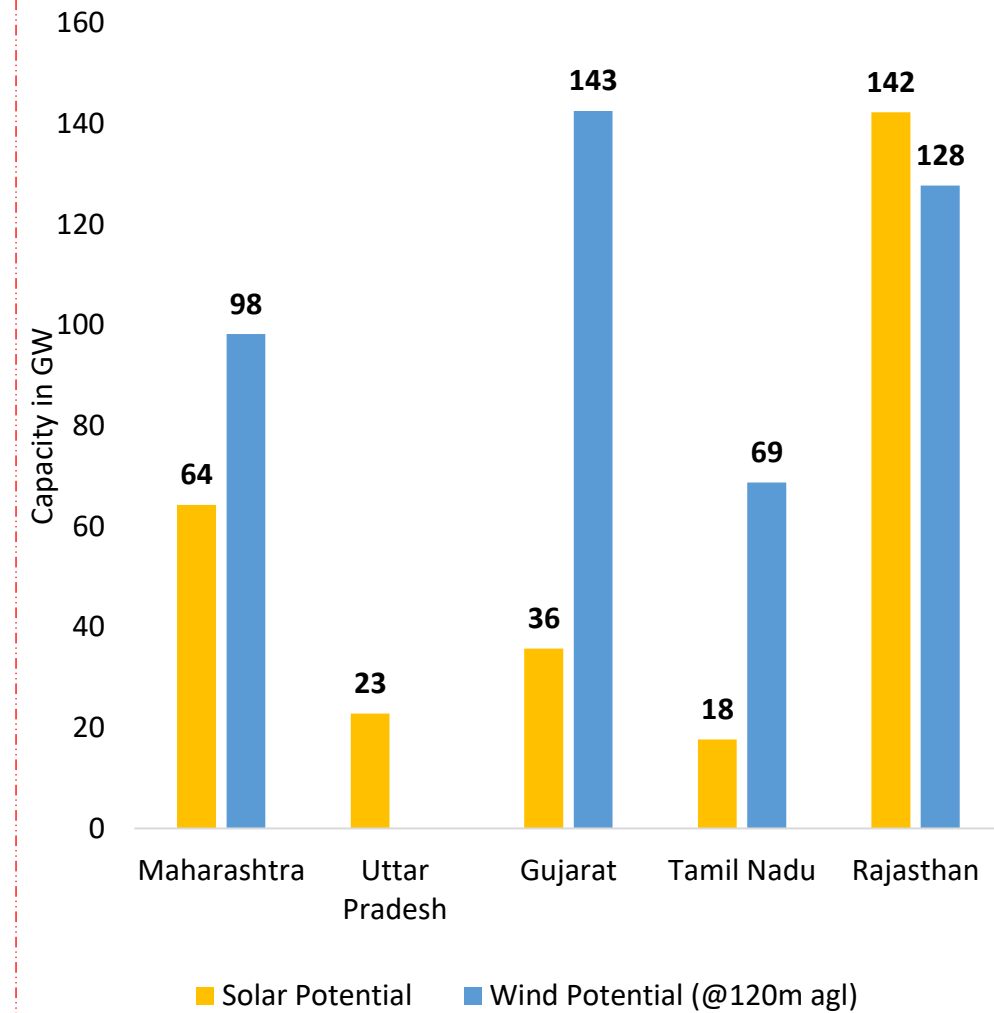


Highest Electricity Demanding States: Energy sources and RE potential (3/3)

State Sources and Generation Share



RE Resource potential in State



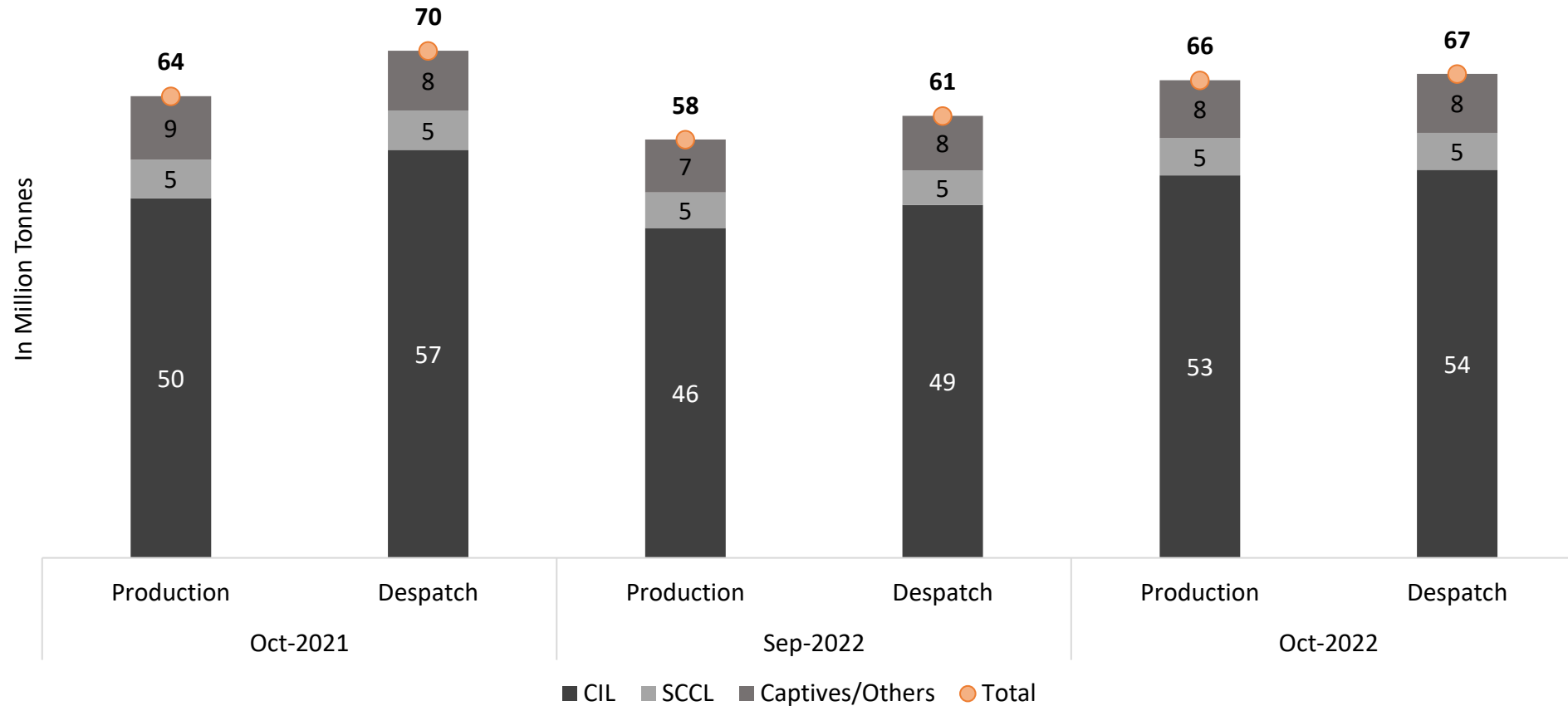
Sources: CEA, MoSPI

Note: The capacity and generation share in the state are based on the plant geographical location and do not represent the actual state contracts/power procurement.





Monthly Coal Statistics

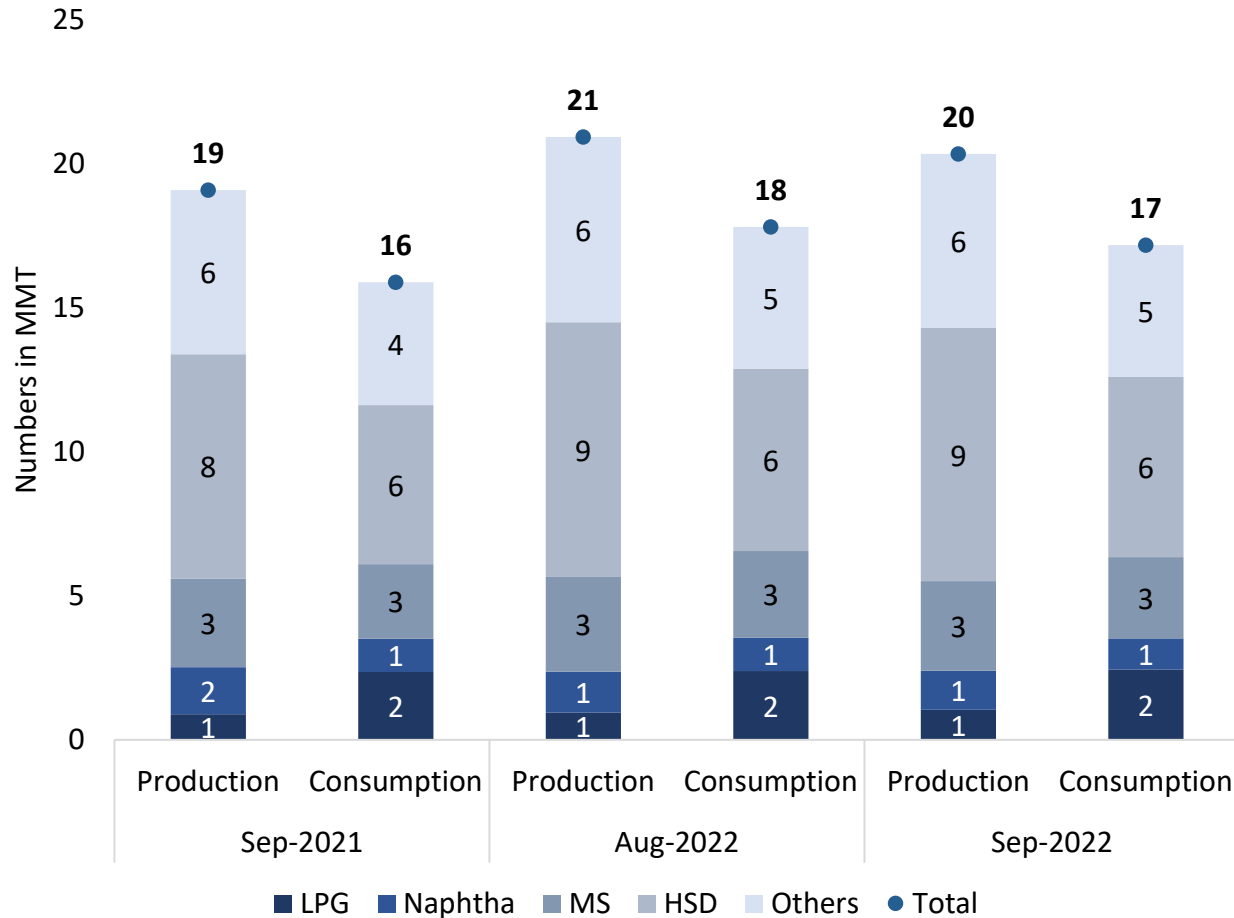


India's coal production increased in Oct-2022 (66 MT) by 3% as compared to Oct-2021 (64MT). Similarly, the coal despatch decreased by 5% in October this year as compared to Oct-2021.



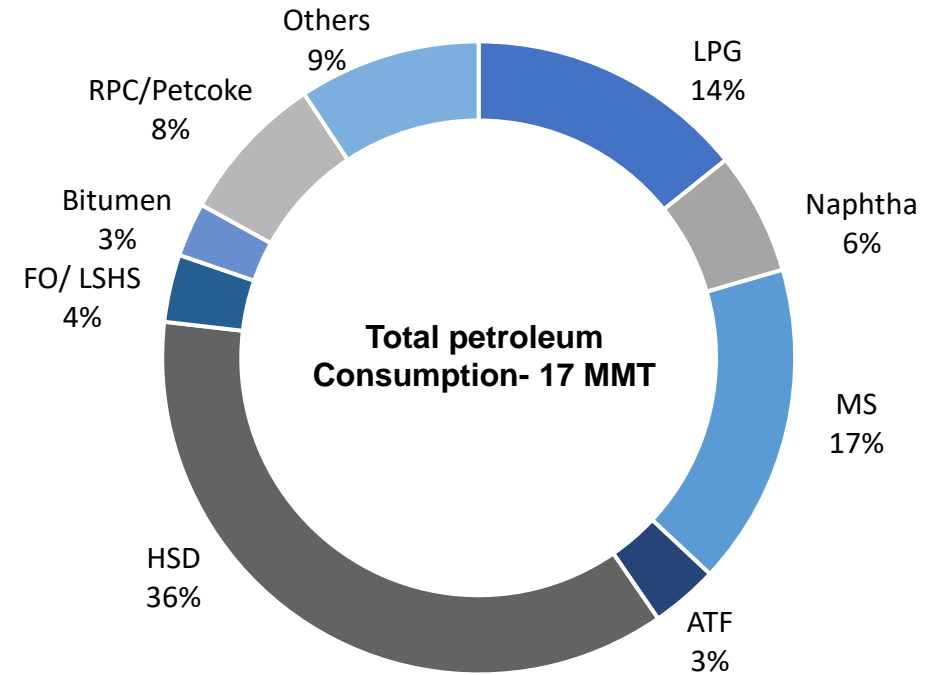
Petroleum Products Market Scenario (1/3)

Petroleum Product-wise Production & Consumption (MMT)



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

Consumption share of Petroleum Products in September 2022



Others include SKO, LDO, Lubes, and Others

Abbreviations

ATF-Aviation Turbine Fuel

HSD- High-Speed Diesel

MS- Motor Spirit (Petrol)

LSHS- Low Sulphur Heavy Stock LPG- Liquefied Petroleum Gas

FO- Furnace Oil

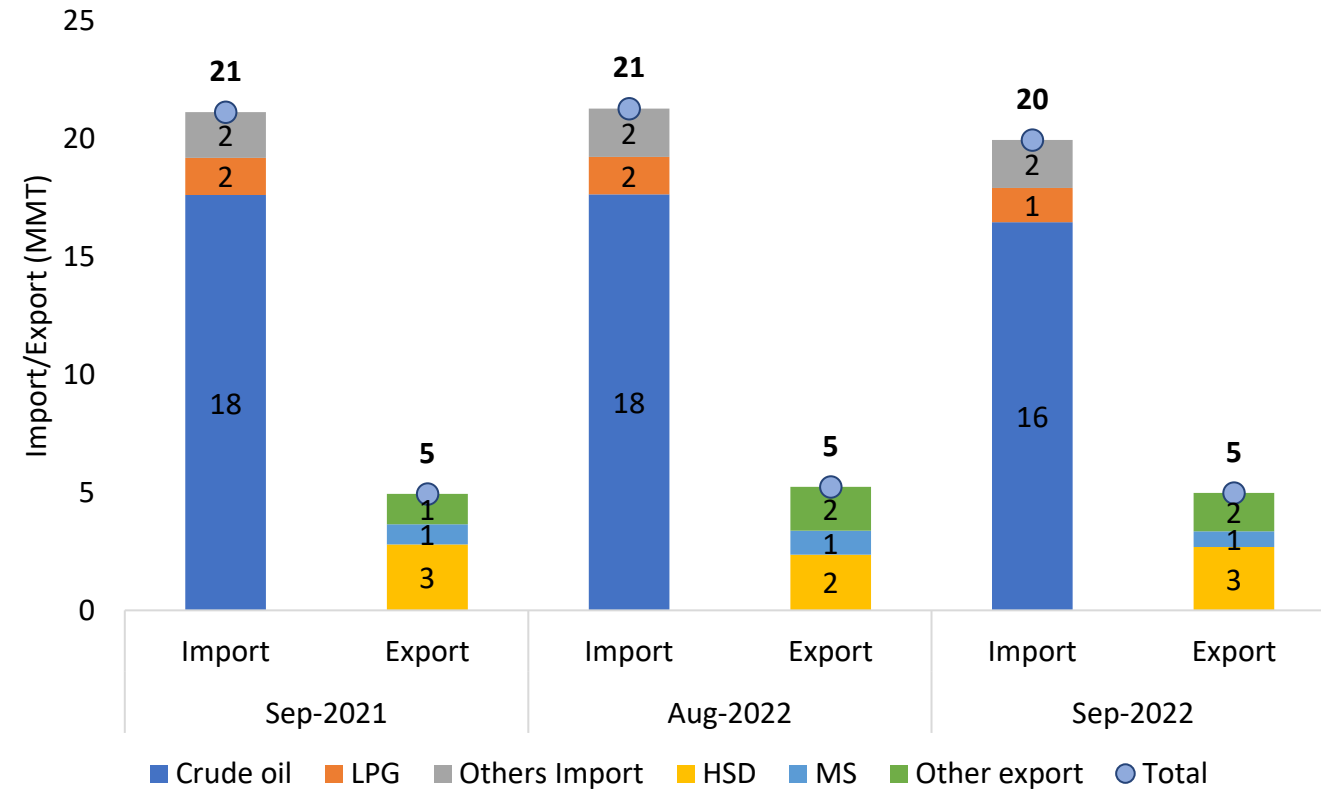
LDO- Light Diesel Oil

SKO- Superior Kerosene Oil



Petroleum Products Market Scenario (2/3)

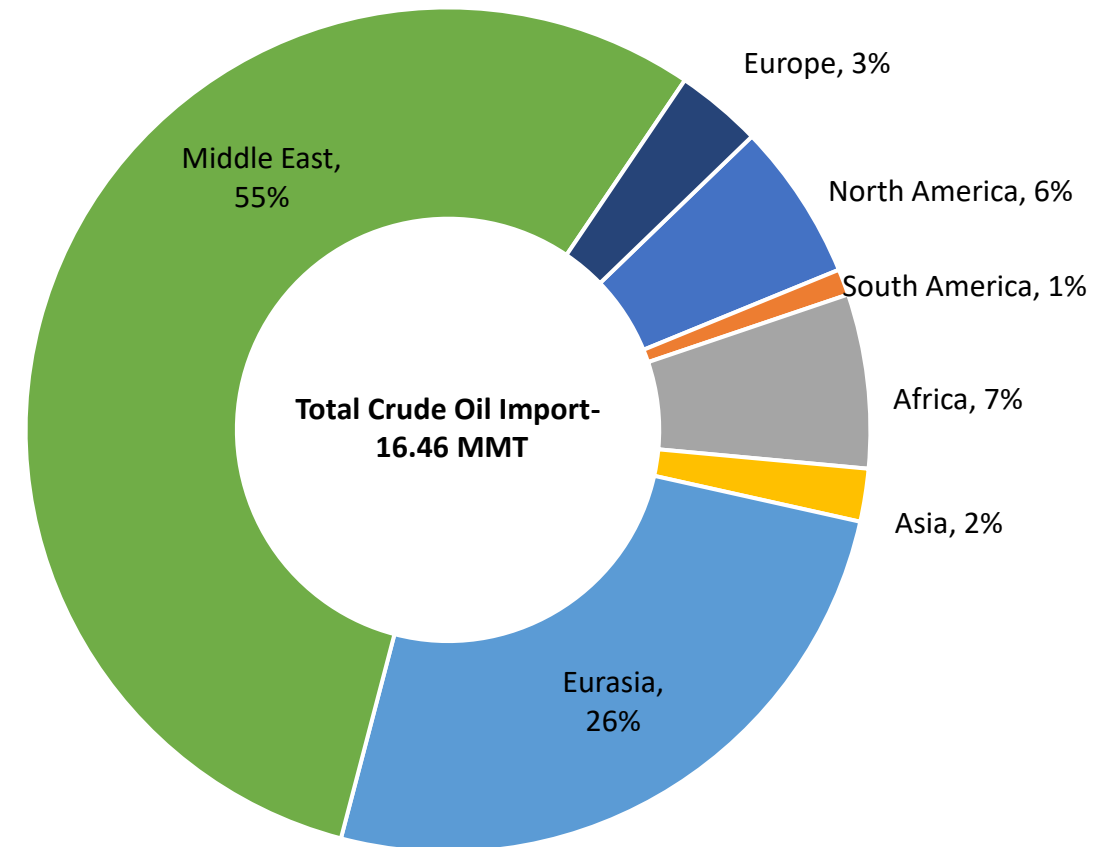
Petroleum Product-wise Import and Export



*Other Imports include Naphtha, MS, ATF, SKO, HSD, LDO, Lubes, FO, Bitumen, pet coke, and Others.

*Other Exports include LPG, Naphtha, ATF, SKO, Lubes, FO, Bitumen, pet coke, and Others.

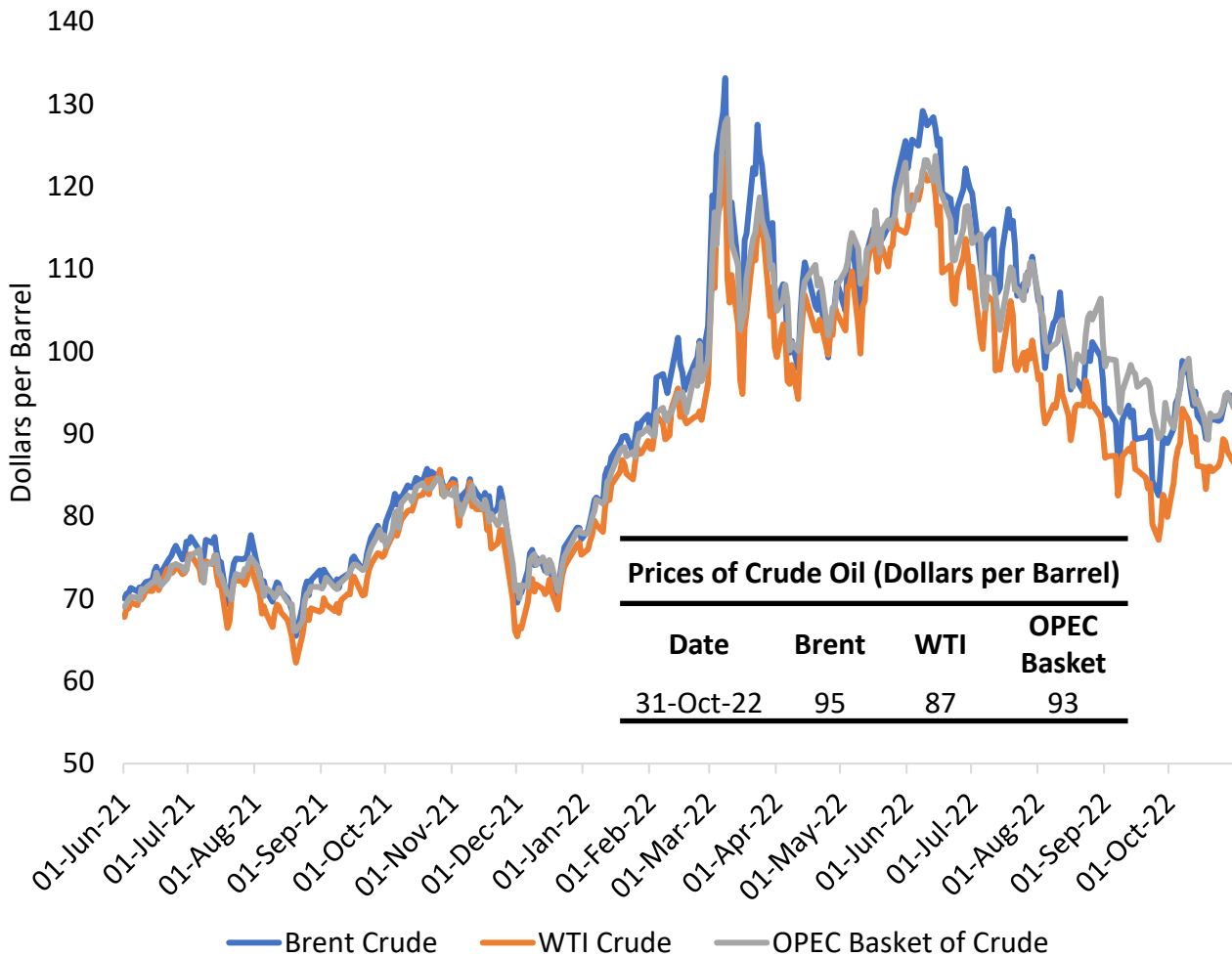
Region-wise Share in Import of Crude Oil (September 2022)



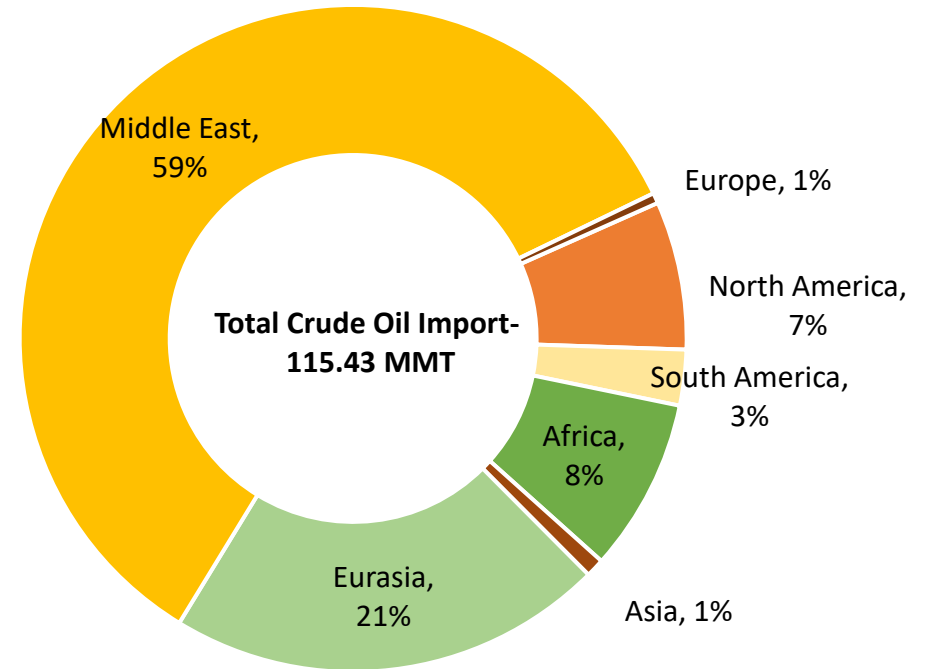


Petroleum Products Market Scenario (3/3)

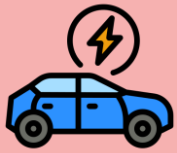
Daily Prices of Crude Oil



Country Wise Share in Import of Crude Oil (April-September 2022)

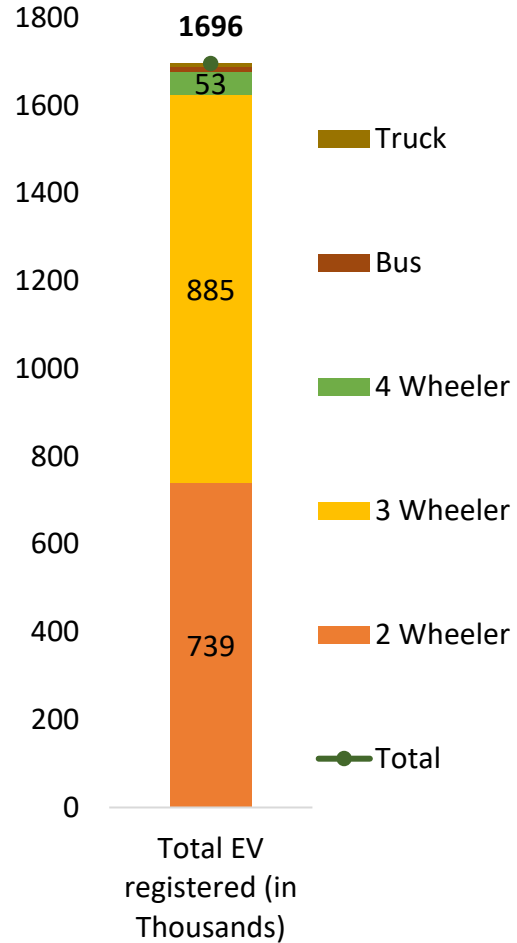


- Crude oil imports increased by 14% during Apr-Sep 2022 as compared to the import in corresponding period of the previous year
- Crude oil imports from OPEC countries decreased to 63.1% of total imports during Apr-Sep 2022 as compared to 69.8% during Apr-Sep 2021.

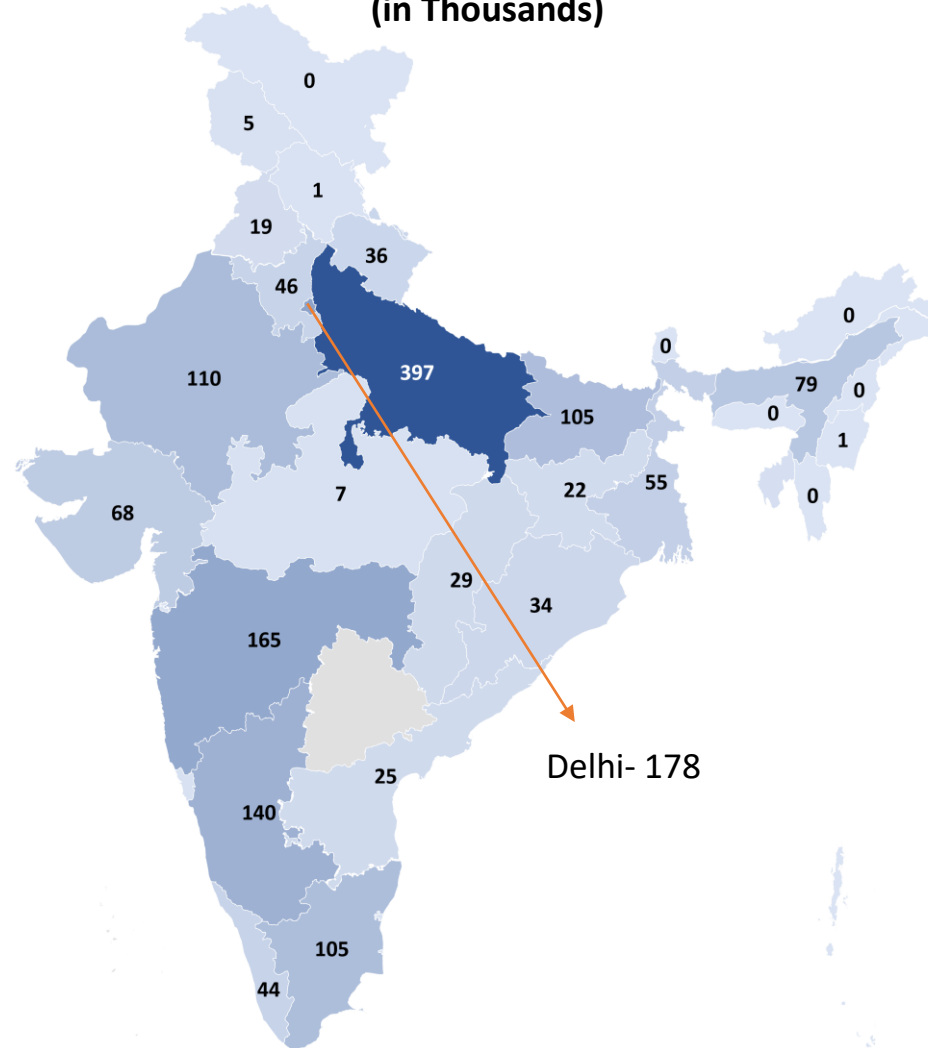


Status of Electric Vehicles in India

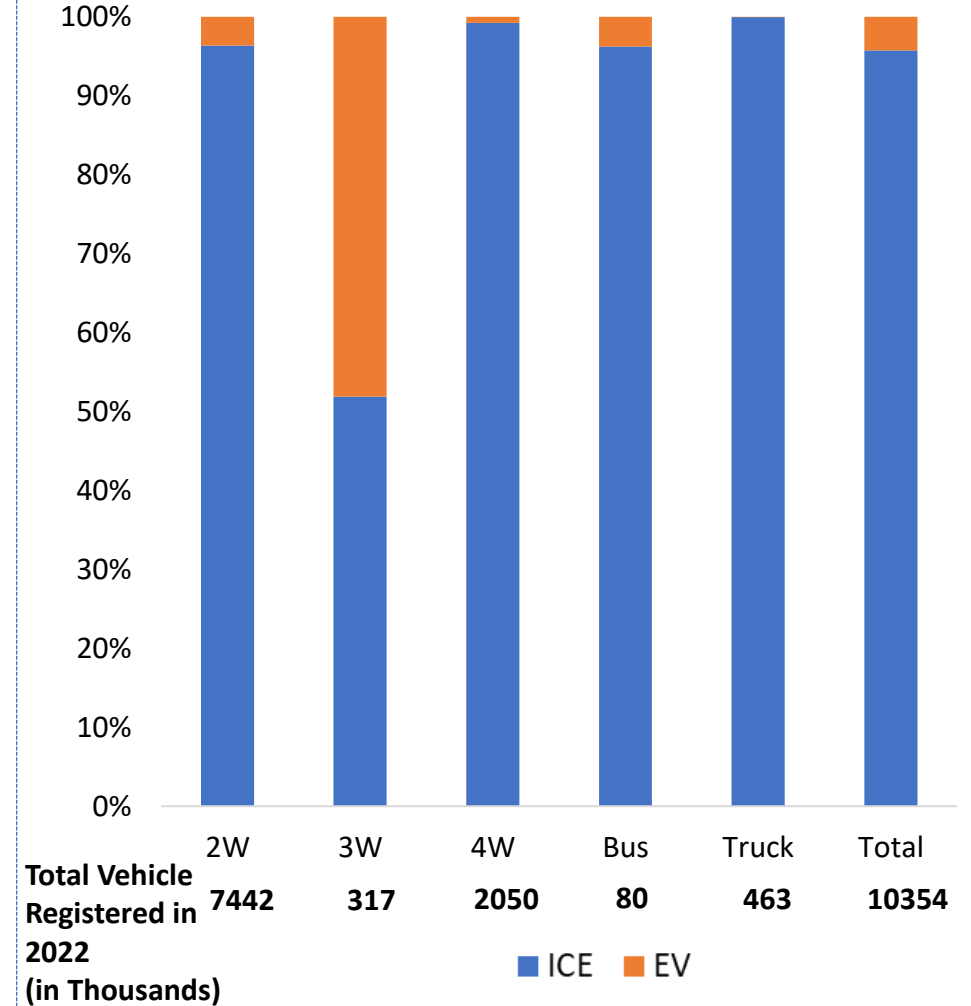
National EV registration (till 2nd November 2022)



State-wise EV registration (till 2nd November 2022) (in Thousands)



EV and ICE sales composition in year 2022



Sources: Vahan Dashboard

1. In Madhya Pradesh most of the EVs registered in FY 2023.
2. Details of Telangana are not available on the Vahan dashboard.
3. EV: Electric Vehicle, ICE: Internal Combustion engine vehicle

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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.

[CFA/ subsidy](#) is available for residential solar rooftop projects up to 10kW.

CFA is applicable under [RTS Phase II](#) for residential consumers in rural areas under the VNM arrangement up to 3kW.

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

The [updated RPO](#) compliance supports solar integration 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

To support [off-shore wind](#), SECI will bid out 4GW to set up an offshore plant on the coasts of Tamil Nadu and Gujarat.

The [inter-state transmission charges](#) are waived for 25 years from the project commissioning before 30th June 2025.

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

The [draft National Repowering Policy](#) 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 area.

BESS

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

Under the [Waste Management Rule 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](#) is 4.0% up to 2029-30.

The [pilot projects](#) are:

- i. 1.4 MW SPV Project with 1.4 MWh BESS in Lakshadweep.
- ii. 50 MWp SPV Project with 20 MW/50 MWh BESS in Phyang, Ladakh
- iii. 100 MW SPV Project with 40 MW/120 MWh BESS in Chhattisgarh.

Green Hydrogen (H₂)

The Hon'ble PM launched the [National Hydrogen Mission](#) to meet the target of 5 million tonnes of green hydrogen production by 2030.

MOP has released the [Green Hydrogen Policy](#) under which the inter-state transmission charges are waived for 25 years of the projects commissioning before 30th June 2025.

MNRE has proposed using [green H₂ in Direct Reduced Iron \(DRI\) production](#) by partly replacing natural gas with H₂ in gas-based DRI plants.

The pilot projects are*-

- i. 25kW AC hydrogen grid at NETRA that includes a 500kW PEM electrolyzer
- ii. 5MW PEM electrolyzer at NTPC Vindhyachal.

NOTE: We have tried to compile only the major interventions (last 2 years), however, a number of initiatives have been taken to support decarbonization.

PLI: Production Linked Incentive, CFA: Central Finance Assistance, VNM: Virtual Net Metering, ACC: Advanced Chemistry Cell, OIL: Oil India Limited, RPO: Renewable Purchase Obligation

*Vasudha Foundation Event on Green Hydrogen in India: Prospects and Opportunities, held on 11th October 2022.



Key Highlights or Announcements of October 2022

1. MNRE has issued the [draft National Repowering Policy for Wind Power Projects, 2022](#). The policy focuses on the optimum utilization of wind energy resources by maximizing energy (kWh) yield per sq. km of the project area and provides direction for utilizing the latest state-of-the-art onshore wind turbine technologies. NIWE has estimated the state-wise repowering potential as shown in the table below.

States	Total Capacity below 0.5 MW	Total Capacity between 0.5-1 MW	Total Capacity between 1-1.5 MW	Total Capacity between 1.5-2 MW	Total Capacity below 02 MW
Tamil Nadu	1181	2919	1813	1473.5	4100
Maharashtra	243	1068	1389	731.35	1311
Karnataka	0.3	954	652	1417.05	954.3
Gujarat	51	1457	1352	1805.35	1508
Rajasthan	39	1192	788	914.9	1231
Madhya Pradesh	0	290	260	1012	290
Kerala	0	18	0	10	18
Andhra Pradesh	92	378	195	1701.2	470
Total	1610	8280	6449	9067	25406

2. Uttar Pradesh has released its [Electric Vehicle Manufacturing and Mobility Policy 2022](#). The new EV policy is designed to encourage faster EV adoption and the creation of EV charging infrastructure. The major highlights are-
 - 100% exemption in registration fees and road tax for any EV purchased in the state for 3 years from the date of notification.
 - In the 4th and 5th years, the state government will waive registration fees and road tax for those who purchase an EV made in the state.
 - The first 2,000 charging stations would receive a 20% subsidy of up to Rs 10 lakh.



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