Energy Policy Updates in India

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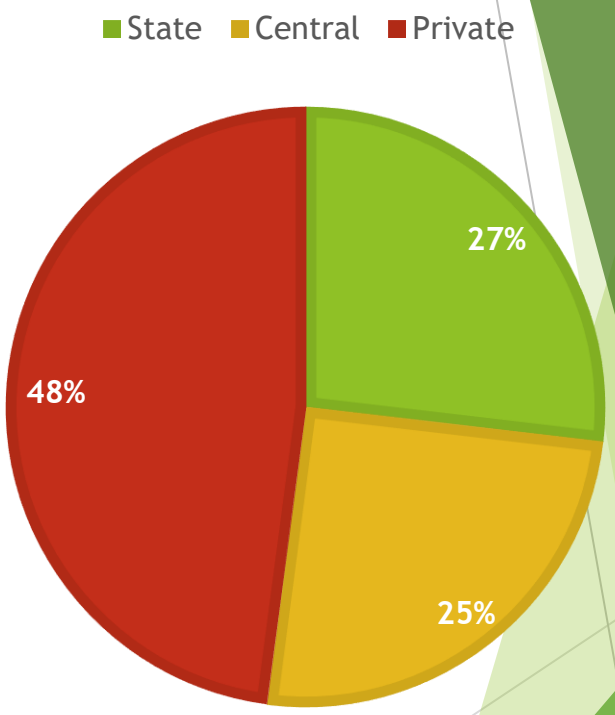
A brief Introduction and Current Scenario in India

Installed Capacity (in MW) as on 31.07.2021

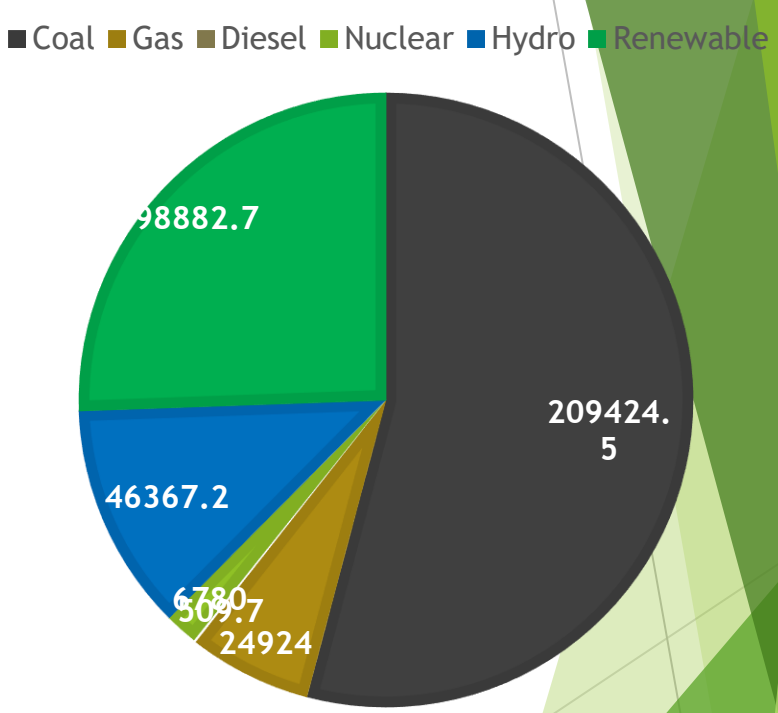
Sector	Installed Capacity(MW
State	103875
Central	97636
Private	185375
Total	**386888**



Total Installed Capacity 386888 MW

Installed Capacity (in MW) as on 31.07.2021

Type	Installed Capacity(MW)
Coal + Lignite	209424.5
Gas	24924
Diesel	509.7
Nuclear	6780
Hydro	46367.2
Renewable	98882.7
Total	**386888**



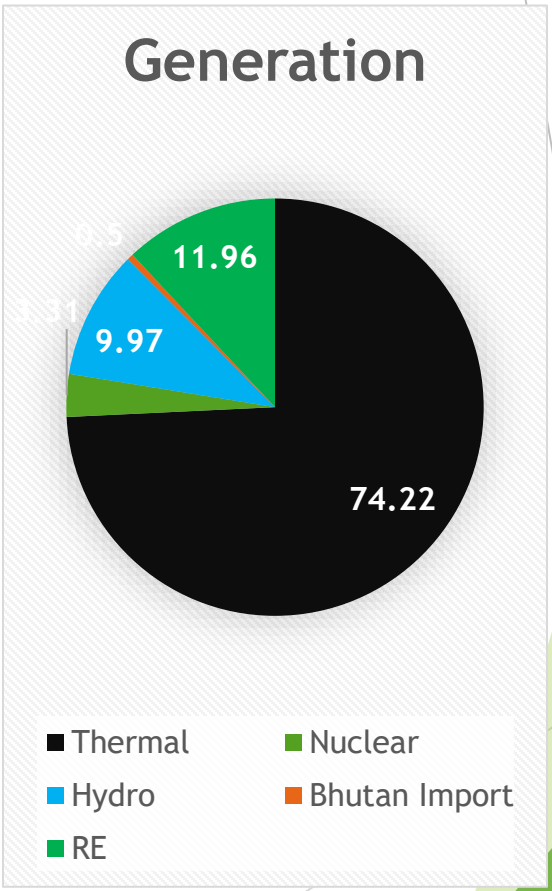
Total Installed Capacity 386888 MW

Growth of Installed Capacity

Plan/Year	Installed Capacity (MW)
1947	1362
1956	2886
1979	26680
1990	63636
2002	105046
2012	199877
2019	363369
2021 (31.07.2021)	386888

Generation Report May 2021

Category	Generation in BU	% of total Generation
Thermal	87.65	74.22
Nuclear	3.92	3.31
Hydro	11.78	9.97
Bhutan Import	0.59	0.5
RE	14.13	11.96
Total	**118.09**	**100**



Load Forecast courtesy 19th EPS, CEA

	2021-22	2026-27	2031-32	2036-37
Electrical Energy Requirement (in BU)	1566	2047	2531	3049
Peak Electricity Demand (in GW)	226	299	370	448

LONG TERM RESULTS- LIKELY INSTALLED CAPACITY BY 2030

FUEL TYPE	INSTALLED CAPACITY (MW) IN 2029-30	%
Hydro*	60,997	7.46%
PSP	10,151	1.24%
Small Hydro	5,000	0.61%
Coal + Lignite	2,66,911	32.66%
Gas	25,080	3.07%
Nuclear	18,980	2.32%
Solar	2,80,155	34.28%
Wind	1,40,000	17.13%
Biomass	10,000	1.22%
TOTAL	8,17,254	
Battery#	27,000MW/108,000MWh	

* including hydro imports
# Active Battery Storage.

INDIA AIMING EMISSION REDUCTION IN POWER SECTOR

In continuing efforts to safeguard the environment and reduce emissions from power sector, India has made the following commitments in COP 21:

- India intends to reduce the emissions intensity of its GDP by 33 to 35 % by 2030 from 2005 level.
- To achieve about **40 percent cumulative electric power installed** capacity from **non-fossil fuel based energy resources** by **2030** with the help of transfer of technology and low cost international finance.
- Introducing new, more efficient and cleaner technologies in thermal power generation
- Further, to reduce emissions from Thermal Power Stations, Ministry of Environment, Forest and Climate Change(MoEF&CC) has also issued new environmental norms in December 2015 regarding Suspended Particulate matter (SPM), SOx, NOx, Mercury. Norms for specific water consumption by Thermal Power Stations have also been notified to conserve water.
- India is running the world's largest clean energy programme to achieve 175 GW of RE Capacity by 2022.

INDIA AIMING EMISSION REDUCTION IN POWER SECTOR

- In this regard India on its part is working on a raft of measures including Clean Electricity, ethanol blending with fossil fuels, green mobility, battery storage and green Hydrogen to held reduce pollution and facilitate commitments made at COP-21.

Govt Initiatives and Thrust Areas in Indian Energy Sector and towards Carbon Neutrality.

Background:

As the world today is standing at the crosshairs of Climate Change, Global Warming and depleting Conventional Sources of Energy manifested in forms of extreme climate events, sea level rise, ocean acidification, biodiversity loss, pollution and degradation of natural environment, India along with all the nations are making strides toward a carbon neutral future and sustainable development.

But for developing nations like India where dependency on conventional sources for their development commitments towards their citizen is still very high. About 65-70% of power generation in India and other developing nations is still from thermal power plants, the path to carbon neutrality will be a difficult one in absence of technological and financial assistance from more responsible developed nations.

Govt Initiatives and Thrust Areas in Indian Energy Sector and towards Carbon Neutrality.

Background:

Therefore Thermal power plants are still here to stay for a considerable amount of time whether in form of providing Flexible support, 2 shift operations etc. Therefore the focus of today should be to make the generation from thermal power plant more clean and sustainable using technologies like Carbon sequestration, Clean Coal technology (CCT), Carbon capture and Storage (CCS), Carbon Capture Utilisation and storage (CCUS), cofiring, installation of pollution controlling equipments etc.

Govt Initiatives and Thrust Areas in Indian Energy Sector and towards Carbon Neutrality.

- India is moving towards large scale integration of renewables as a result of which **flexible operation** of thermal power plants has become need of the hour. Ministry of Power has prepared a broad list of initiatives to be taken up under the five year vision programme of the government. One of the top priority given is to build up the flexible thermal generation to accommodate the high penetration of renewables. Under this key initiative the minimum load and ramp rates of thermal generating units are required to be improved.
- New Coal fired Units in the 13th Plan (2017 Onwards) will only be based on **Supercritical Technology** as these are more efficient, consume less coal and emit less CO2 compared to conventional Subcritical Units. Indigenous research is being pursued for development of Advanced Ultra Supercritical Technology (A-USC).

Govt Initiatives and Thrust Areas in Indian Energy Sector and towards Carbon Neutrality.

- Retirement of old and inefficient Units.
- **Installation of FGD/ESP Upgradation** and other emission mitigating equipment in thermal power plants to reduce the carbon footprint/pollution from Thermal Power Stations and improve ambient air Quality.
- **Green Energy Corridor**: aims at evacuation and synchronizing electricity produced from renewable sources with conventional power stations in the grid.

Govt Initiatives and Thrust Areas in Indian Energy Sector and towards Carbon Neutrality.

- **National Mission on use of Biomass in coal based thermal power plants:** To address the issue of air pollution due to farm stubble burning and to reduce carbon footprints of thermal power generation, Ministry of Power has set up a National Mission on use of Biomass in coal based thermal power plants. The objective of the mission is to increase the level of co-firing from present 5% to higher levels to have a larger share of carbon neutral power generation from the thermal power plants, to take up R&D activity in boiler design to handle the higher amount of silica, alkalis in the biomass pellets, overcoming the constraints in supply chain of bio mass pellets and agro- residue and other regulatory issues in biomass co-firing.

Govt Initiatives and Thrust Areas in Indian Energy Sector and towards Carbon Neutrality.

- **National Hydrogen Mission:** The aim is to make India a global hub for the production and export of green Hydrogen. NHM would enable the generation of hydrogen “from green power sources”. The mission aims at reducing fossil fuel use, green house emissions, air pollution, boost India’s energy security and to contribute to a more diverse and energy efficient infrastructure by enabling the widespread commercialization of hydrogen, fuel cells and associated technologies.

Govt Initiatives and Thrust Areas in Indian Energy Sector and towards Carbon Neutrality.

- **E-Mobility**: The government is focusing on decarbonising the transport sector through increased efficiency, cleaner fuels, electric mobility etc. In 2017 began by ambitious target of 100% electric cars by 2030 through schemes like FAME, National mission on transformative mobility and battery storage (NMTMBS) etc to boost its energy security and combat Climate Change. This is further giving boost to Charging Infrastructure, battery storage and need for grid stability. Further BS6 emission norms have brought to regulate the output of air pollutants.
- **Energy Storage** is one of the most crucial and critical component of India's energy infrastructure strategy and also for supporting India's sustained thrusts to renewable- National Energy Storage Mission is underway.

Govt Initiatives and Thrust Areas in Indian Energy Sector and towards Carbon Neutrality.

- **Energy Efficiency**:Bureau of Energy Efficiency (BEE) has launched ‘Perform, Achieve and Trade’ (PAT) scheme under the National Mission for Enhanced Energy Efficiency. It aims to make the industrial sector energy efficient. The scheme has set energy efficiency targets for industries. Those that fail to achieve targets will have to pay penalty.

Govt's Initiatives and Thrust Areas

Renewable Power

- Worlds largest renewable Integration plan:- 175 GW renewable Capacity to be added by 2022(Solar-100 GW, Wind 60 GW, SHP- 5GW, Bio.- 10 GW)

Electrification

- Integrated Power development Scheme (IPDS) for urban areas
- Pradhan Mantri Sahaj Bijli Har Ghar Yojana - Saubhagya(सौभाग्य)"
- Distributed Decentralized Generation (DDG) for remote areas
- National Smart Grid mission

Other reforms

- UDAY scheme launched to improve the financial condition of Distribution company.
- Creation of a power sector development fund to bailout stressed projects
- Coal linkage rationalization
- Liberally allowing coal swaps from inefficient plants to efficient plants and from plants situated away from mines to pithead plants to minimize cost of coal transportation
- Proposed amendments in the Electricity Act

Way forward

- Despite the series of events and trends witnessed over past few years, Coal still remains the world's second largest primary energy source today, after oil, and the largest source of electricity.
- With its rapid decline in consumption in West, coal's future will depend heavily depend on our ability to tackle the emission from existing facilities using coal and will remain a critical element of our efforts to address Climate Change.
- Continued efforts in the direction of Technologies like Carbon sequestration, Clean Coal technology (CCT), Carbon capture and Storage (CCS), Carbon Capture Utilisation and storage (CCUS), cofiring, low load functioning and ramping capability, installation of pollution controlling equipments etc will play a pivotal role in shaping the future of Coal.

Thank you For the attention

नमस्कार