



Energy transition in India

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Focused on renewable generation

Installed capacity

	Actual as on 31.08.2021		Target as on 31.03.2022		Target as on 31.03.2030	
	(GW)	(%)	(GW)	(%)	(GW)	(%)
Thermal:	209.33	53.93	217.0	45.40	267.00	32.09
Hydro:	46.41	11.96	51.0	10.67	76.00	8.77
Gas:	24.92	6.42	25.0	5.23	25.00	3.00
Nuclear:	6.78	1.75	10.0	2.09	19.00	2.04
Renewable:	100.68	25.94	175.0	36.61	450.00	54.09
Total:	388.13	100.00	478.00	100.00	837.00	100.00



Steps towards clean Environment

1. RE Integration
2. Environment compliance of coal fired power plants
3. National Mission on use of Biomass
4. National Hydrogen Mission.
5. National Mission for Enhanced Energy Efficiency

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Steps recognized for integration of renewable generation

1. Balancing of grid at national level which will minimize the requirement of flexible power.
2. Provision of separate tariff for flexible hydro power.
3. Establishment of new pump storage/hydro plant in combination with solar and wind plant.
4. 500 MW & 210 MW size units shall be operated at lower load than bigger size units.
5. Low load study/test is being conducted for implementation of measures in thermal unit for flexible operation.
6. Provision of separate tariff for flexible thermal power.
7. Demand side management targeted at domestic, agriculture, industrial and e-mobility sector for rationalization of energy consumption.
8. Battery storage capacity.
9. Capacity building for power plant operators.



New Environment Norms

Emission parameter	TPPs (units) installed before 31.12.2003	TPPs (units) installed after 01.01.2004 and up to 31.12.2016	TPPs (units) to be installed from 01.01.2017
Particulate Matter	100 mg/Nm ³	50 mg/Nm ³	30 mg/Nm ³
Sulphur Dioxide (SO ₂)	600 mg/Nm ³ for units less than 500MW capacity	600 mg/Nm ³ for units less than 500MW capacity	100 mg/Nm ³
	200 mg/Nm ³ for units 500MW and above	200 mg/Nm ³ for units 500MW and above	
Oxides of Nitrogen (NO _x)	600 mg/Nm ³	450 mg/Nm ³	100 mg/Nm ³
Mercury	0.03 mg/Nm ³	0.03 mg/Nm ³	0.03 mg/Nm ³
WATER NORMS	<p>I. All existing CT based plants shall reduce specific water consumption up-to maximum of 3.5 m³/MWh within a period of 2 years.</p> <p>II. New plants to be installed after 1.1.2017 shall have to meet specific water consumption of 3 m³/ MWh & achieve zero water discharge.</p>		



New Environment norms under compliance

SPM:

Large number of thermal generating units are meeting new SPM norms and upgradation of ESP is being undertaken in generating units those are not meeting the norms.

SO₂ norms:

FGD is being installed in thermal power plant to meet the SO₂ norms.

NO_x norm:

Combustion modification is being done in generating units to meet NO_x norms.



Government initiatives

- **National Mission on use of Biomass in coal based thermal power plant:** The objective of the mission is to increase the level of co-firing from present 5-7% to higher levels. Initiated R&D activity in boiler design to handle the higher amount of silica, alkalis in the biomass pellets. To look into the constraints in supply chain of bio mass pellets/ agro- residue and other regulatory issues in biomass co-firing.
- **National Hydrogen Mission:** The Mission aims to support the government in meeting its climate targets and focus deeply on the generation of green hydrogen which is extracted from clean and green power sources and enable its commercial viability as a transportation fuel.
- **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.



Thank you



Other initiatives

- Feasibility of clean coal technologies viz. Integrated Gasification Combined Cycle (IGCC) and Carbon Capture, Utilization And Storage (CCUS).
- Development of the Advanced Ultra Supercritical (AUSC) Technology for Thermal Power Plants.
- Carry out research in utilization of agro residue in thermal power plants including increasing the percentage of co-firing of biomass pellets with coal

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