

Meeting the Energy Needs of the Future

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Renewable energy sector in India has emerged as an integral part of the solution to meet the nation's energy needs. There has been a visible impact of renewable energy in the Indian energy scenario during the last few years as India is on its way to achieving the 175 GW target for installed Renewable Energy capacity by 2022.

The Ministry of New and Renewable Energy (MNRE) has taken several steps for a clean energy future by taking up the largest renewable capacity expansion programme in the world. Till March 2018, a capacity addition of 37.33 GW of renewable energy has been reported during the last four years (May 2014-March 2018) with a total of 69 GW (20 per cent) renewable energy installed capacity. In order to achieve the renewable energy target of 175 GW by the year 2022, the Ministry of New and Renewable Energy launched schemes on development of wind-solar hybrid power projects, onshore wind power projects, biomass power and bagasse cogeneration, biomass gasifier for industries, scheme for development of solar parks and ultra-mega solar power projects, grid connected solar PV power plants on canal banks and

canal tops and biogas based grid power generation programme.

Among all, the National Solar Mission is the most ambitious program which aims to promote solar energy for power generation with an aim of making levelized cost of solar energy competent with coal/ gas based power generation. Historic low tariffs for solar (Rs. 2.44/ unit) and wind (Rs. 2.64/ unit) were achieved through transparent bidding and facilitation giving a big push to the renewable sector.

The Government of India is promoting renewable energy by generation-based incentives (GBIs), capital and interest subsidies, viability gap funding, concessional finance, fiscal incentives etc. for providing financial support to various schemes. Ministry of New and Renewable Energy has taken various special steps in addition to financially support this sector. These include amendments to the Electricity Act and tariff policy for strong enforcement of Renewable Purchase Obligation (RPO) and for providing Renewable Generation Obligation (RGO), evacuation of renewable power through green energy corridor project, incorporating measures

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in Integrated Power Development Scheme (IPDS) for encouraging distribution companies and making net-metering compulsory and raising funds from bilateral and international donors as also the Green Climate Fund to achieve the target.

Major Initiatives

Solar Power

- Capacity of the scheme for “Development of Solar Parks and Ultra Mega Solar Power Projects” has been enhanced from 20 GW to 40 GW.
- Amendments in building by-laws for mandatory provision of roof top solar for new construction or higher floor area ratio and making roof top solar as a part of housing loan by banks/ NHB
- Provision of roof top solar photovoltaic system and 10 per cent renewable energy as mandatory under mission statement and guidelines for development of smart cities
- Raising tax free solar bonds for managing equity to setup solar projects.
- Tariff based competitive bidding process for purchase of solar power.
- Central financial assistance for setting up roof top solar PV, up to 30 per cent of the benchmark cost in residential, institutional and social sectors in general category states and up to 70 per cent of the benchmark cost in special category states.
- Surya-Mitra programme has been launched for creation of a qualified technical workforce and over 11 thousand persons have been trained under the programme.

Wind Power

- In terms of wind power installed capacity, India is globally placed at 4th position after China, USA and Germany.



- The wind power potential of the country has been reassessed by the National Institute for Wind Energy (NIWE). It has been estimated to be 302 GW at 100-meter hub-height.
- India has a long coastline where there is a good possibility for developing offshore wind power projects. The cabinet has cleared the National Offshore Wind Energy Policy.
- NIWE has signed MoU with Gujarat and Rajasthan based on wind forecasting experience of Tamil Nadu.
- Meso scale map prepared for wind resource at 120 meter height, as most of the turbine hub heights being installed are more than 100 meters.

Bioenergy

- Central financial assistance for biomass power projects includes installations from biomass combustion, biomass gasification and bagasse co-generation.
- Promotion of off-grid biogas power project for captive power generation.
- Family Size Biogas Plants mainly for rural and semi-urban households are set up under the National Biogas and Manure Management Programme (NBMMP).

Amendments in Tariff Policy

- Enhancement in solar renewable purchase obligation to 8 per cent by March 2022.
- Introduction of renewable generation obligation for new coal/lignite based thermal plants.





- Bundling of renewable power for ensuring affordable renewable electricity.
- Waving off inter-state transmission charges for solar and wind power.
- Further, pursuant to the revised tariff policy, the Ministry of Power has notified the long term growth trajectory of renewable purchase obligation for solar and non-solar energy for the next 3 years i.e.

2016-17, 2017-18 and 2018-19 as per table-II.

Green Energy Corridor

Intra-State Transmission System is being implemented by eight renewable rich States (Tamil Nadu, Rajasthan, Karnataka, Andhra Pradesh, Maharashtra, Gujarat, Himachal Pradesh and Madhya Pradesh) with a purpose is to evacuate approx. 20,000 MW of large scale renewable power.

Table I : Down ward Trend in Solar Tariff Chronology:

| S. No | Period | Capacity | Lowest Tariff (Rs./ KWh) | Scheme | State |
|-------|---------------|----------|--------------------------|--------------|-----------------------------------|
| 1 | February-2017 | 750 MW | 3.30 | State Scheme | Madhya Pradesh (REWA Solar park) |
| 2 | May-2017 | 250 MW | 2.62 | VGf Scheme | Rajasthan (Bhadla IV Solar park) |
| 3 | May-2017 | 500 MW | 2.44 | VGf Scheme | Rajasthan (Bhadla III Solar park) |
| 4 | Aug-17 | 500 MW | 2.65 | State Scheme | Gujarat (Non-Solar Park) |

(Source: Ministry of New and Renewable Energy)

Table II

| Long term trajectory | 2016-17 | 2017-18 | 2018-19 |
|----------------------|----------------|----------------|----------------|
| Non-solar | 8.75 per cent | 9.50 per cent | 10.25 per cent |
| Solar | 2.75 per cent | 4.75 per cent | 6.75 per cent |
| Total | 11.50 per cent | 14.25 per cent | 17.00 per cent |

The total project cost of Rs. 10141 crores includes about approx. 9400 ckm transmission lines and substations of total capacity of approx. 19000 MVA

Other Initiatives

- Formation of International Solar Alliance (ISA) which became a legal entity in December 2017. India has been playing a leading role in the International Renewable Community along with France, with its headquarters in India. ISA is an international body of 121 countries lying between Tropic of Cancer and Tropic of Capricorn.
- Bank loans up to a limit of Rs.15 crores will be given to borrowers for purposes like solar based power generators, biomass based power generators, wind power systems, micro-hydel plants and for renewable energy based public utilities viz. street lighting systems, and remote village electrification. For individual households, the loan limit will be Rs.10 lakh per borrower.
- Foreign Direct Investment (FDI) up to 100 per cent is permitted under the automatic route for renewable energy generation and distribution projects subject to provisions of the Electricity Act, 2003.

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