# Is India on track to meet RE target of 175 GW by 2022

## Wind energy

**1.** India ranks fourth in the world in terms of installed wind power – 37.5 GW as of December 2019. (see Graph 1)

**2.** Government has set a somewhat modest target of 60 GW for wind – as compared to 100 GW for solar – to be met by 2022.

**3.** Government remains confident of meeting this target; with 37 GW installed, another 13 GW in different stages of tendering and development and another 10 GW to be tendered. (see Table 1)

**4.** But industry is not so sanguine. CRISIL reports that wind installations may reach only 45 GW by March 2022. This is also clear from MNRE's under-achievement of its annual targets; in 2017-18 and 2018-19, against its target of 4000 MW, it only realized 1865 and 1461 respectively, or roughly 40 per cent. (see Graph 2)

**Table 1: Status of wind projects as on 30th September, 2019**

| Target (GW) | 60 |
|---|---|
| Installed capacity (GW) | 36.93 |
| Under implementation (GW) | 9.78 |
| Tendered (GW) | 3.84 |

Source: Standing Committee on Energy (2019-20), MNRE, Demand for Grants

**5.** This is when there is a high wind energy potential in the country; according to assessments of the National Institute of Wind Energy (NIWE), the country has a potential of 302 GW at 100 m hub and 695 GW at 120 m hub.

**6.** Till 2008; wind energy was promoted through accelerated depreciation – giving investors an interest in the installation of wind farms, but not necessarily in the generation of power. In 2009, the policy shifted to generation based incentives – providing 0.50 paise for every unit of wind energy fed into the grid. In March 2017, this policy was discontinued and there was a shift to competitive bidding. The first 1050 MW auction held by SECI in February 2017, brought a record bid of ₹ 3.46/unit, as against the lowest operating price of ₹4.16 in Tamil Nadu. Since then 6.4 GW has been auctioned and tariffs have fallen steadily, reaching 2.43/unit in December 2017. Subsequently, increased risks have driven up the costs.

## Box 1: An economic analysis of repowering

**Assumptions**

- Remaining life of the project/PPA: 10 years
- Tariff for old project: ₹ 5.75/kWh
- Tariff for new project: ₹2.7/kWh
- O&M costs: ₹2.3 million/MW per annum, inflated at 5 per cent every year
- Wheeling and transmission charges have been ignored to simplify simulation. Also, they vary across the country with many states partly waiving them.

| | Old project | New project | |
|---|---|---|---|
| Capacity | 500 kW x 2 turbines | 2 MW | 4 MW |
| CUF (%) | 10 | 40 | 45 |
| NPV | Rs 2.7 crore | | |
| Expected increase in tariff | | Rs 0.2/kWh | Rs 0.08/kWh |

The above analysis clearly shows that repowering is economically lucrative. The compensation that needs to paid to the old turbine owners will be just about 3-7 per cent of the tariff of the new turbine, depending on the size of the new turbines.

Source: CSE, State of Renewable Energy 2019

In 2019, the tariff cap was revised to ₹2.93/unit, but industry says this is still unviable. All the auctions of 2019-20 have been undersubscribed and the total response has been 45 per cent. (see Graph 3)

### 7. Reasons for slow-down

a. Delay in payments: The case is same as with solar developers – as of July 2019 roughly ₹10,000 crore was owed to RE developers and even this payment, when it is disbursed is delayed.

b. Lack of financial viability in projects: MNRE has put tariff cap for wind auctions – the last price for wind was 2.93/unit (solar was 2.85/unit). Industry says tariff caps make the project unviable.

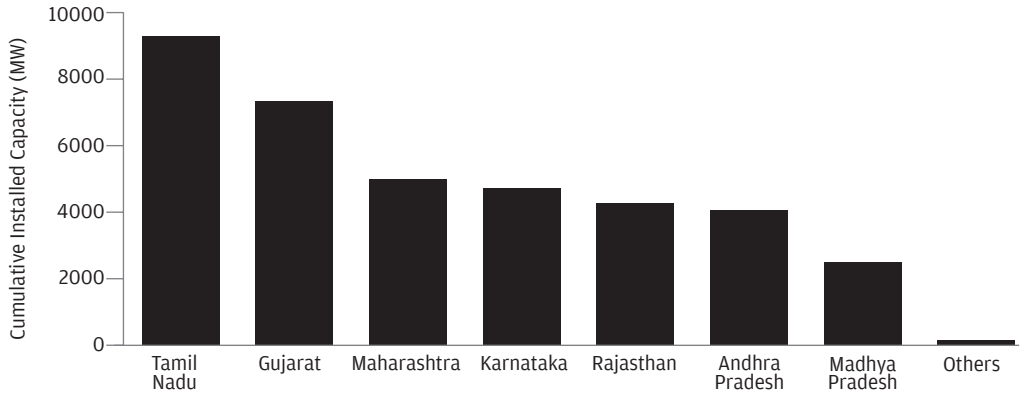
c. Transmission network: Timely development of transmission infrastructure to evacuate power from upcoming RE plants is a key hurdle. RE projects have a short gestation period of about two years, but transmission networks in India have usually been planned and constructed over four to five years. Mega scheme, such as the Green Energy Corridors (GEC)-I & II

## Table 2: Wind-Solar Hybrid Projects awarded by SECI

| Developer | Project Capacity (MW) | Tariff (INR/ kWh) | Project Location | Scheduled Commissioning Date |
|---|---|---|---|---|
| Mahoba Solar (UP) Private Limited | 390 | 2.69 | Rajasthan | 03.12.2020 |
| SBE Renewables Ten Private Limited | 450 | 2.67 | Tamil Nadu | 03.12.2020 |
| Adani Renewable Energy (Park) Gujarat Ltd. | 600 | 2.69 | Rajasthan | 17.02.2021 |
| **Total** | **1440** | | | |

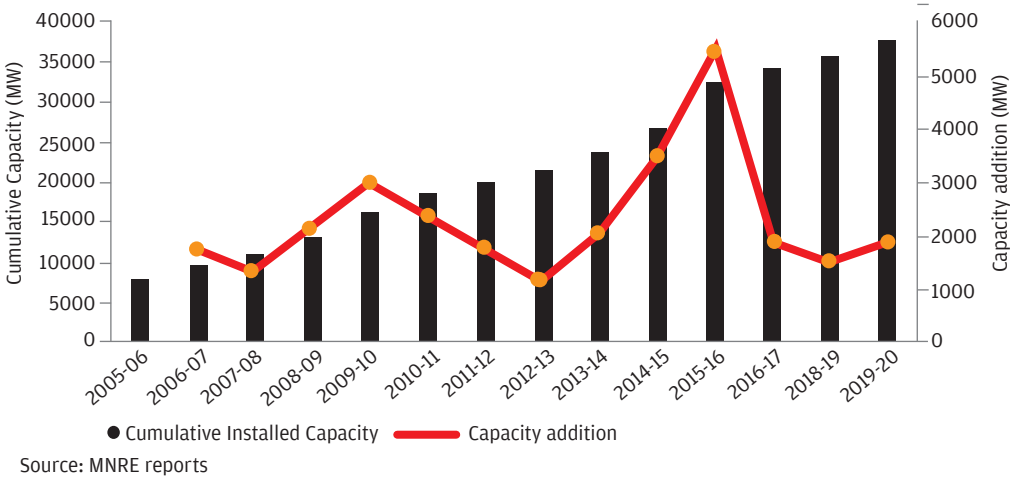
Source: MNRE

## Graph 1: Wind energy: State-wise installed capacities till December 2019




Source: MNRE

## Graph 2: Capacity addition and total installations of wind energy in India




Source: MNRE reports

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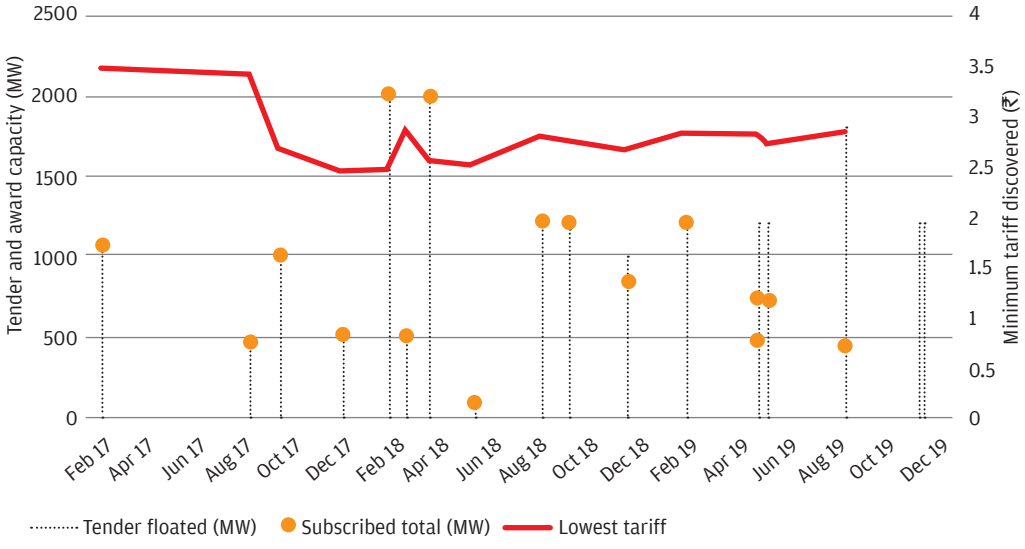
**Graph 3: Wind Energy Project Auctions and Minimum Discovered Tariffs**




Compiled by CSE

and Transmission system for Renewable Energy Zones (for 66.5 GW RE capacity), are under implementation, but these are facing commissioning delays.

d. Accessibility to windy sites: Wind is expected to match the solar prices, which will only happen if the site has a high wind potential. Only two states – Gujarat and Tamil Nadu – have such sites, where projects can achieve the tariffs under the cap. But these states are not ready to give up land for wind projects to be developed under Inter-state transmission System (ISTS) model – where energy can be exported through the grid. Land acquisition is becoming a huge constraint.

e. Curtailment of generation: The wind generation is highly variable and seasonal, making it difficult to predict the expected generation at any time of the day. Despite new installations, the wind generation has been lower in 2019 during all the monsoon months from July through October with respect to 2018, which indicates curtailment.

**8.** Well-established manufacturing sector is under stress because the auctions are not coming in enough capacity and regularly. From nearly 20 manufacturers operating in 2016-17, only a few survive now. Even the home-grown Suzlon Group, accounting for 35 per cent of existing installations, is on the brink of bankruptcy.

**9. Re-powering wind projects:** India has the potential to add 10 GW by repowering wind farms that currently occupy high wind sites but employ low capacity turbines (1 MW). The policy has been a complete failure since it was announced in 2016. (see Box 1)

**10. Off-shore wind:** With a long coastline, India's immense off-shore wind potential is unexploited. National Offshore Wind Policy notified in October 2015. Despite suitable conditions, the pace of development has been slow and the 5 GW target is out of reach given project gestation of 6-7 years. Not enough actions are taken as of now.

**11. Hybrid (Wind-Solar):** Notified in 2018. So far, projects worth more than 4,500 MW has been announced but less than one-third capacity is under implementation. These projects are facing combined problems of solar and wind sector both. (see Table 2)

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