ONSHORE WIND POWER

With 17353 MW of wind power installed in the country as on 31st March 2012, it constituted the mainstay of renewable power in the country, contributing to 70% of the total RE capacity. The present capacity is 19564 MW, (30th June 2013) most of which is located in the southern and western high solar resource states of Tamil Nadu, Karnataka, Maharashtra, Gujarat and Rajasthan. The target for grid connected wind power under the 12th Plan is of adding 15 GW capacity. With regard to wind power, while the recently revised official figures stand at 102 GW, various studies point out that the actual potential could be anywhere between 500 - 1000 GW which indicates that the wind resource availability is not a constraint for wind power development. Availability of land, transmission infrastructure and reliable integration of variable generation would be key factors that may limit the uptake of wind power.

Level 1

Level 1 assumes that wind power capacity addition would be significantly slower than that prescribed under the 12th Plan or as required to meet guiding NAPCC targets. Reliably integrating variable generation would remain a challenge. The 12th Plan addition would only be around 8.5 GW assuming the same annual addition as in 2012-13. 13th Plan addition would be slightly higher at 10 GW. Capacity would increase to roughly 35.8 GW by 2022, and increase to about 67 GW by 2047.

Level 2

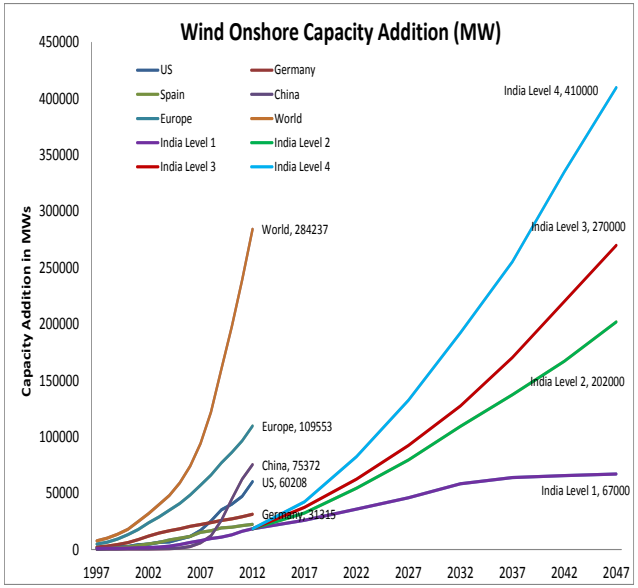
Level 2 assumes that the capacity addition would follow the 12th and 13th Plan trajectories. By 2017, capacity would reach close to 32 GW in line with the 12th Plan projections, while by 2022 it would reach 54 GW. Capacity addition increases strongly thereafter, culminating in a cumulative capacity of 202 GW by 2047. This implies a 35 year CAGR of 7.26% (2007-2047). Additional investments to strengthen transmission and evacuation systems would be put in place. Development of a Green Transmission Corridor has already been approved very recently.

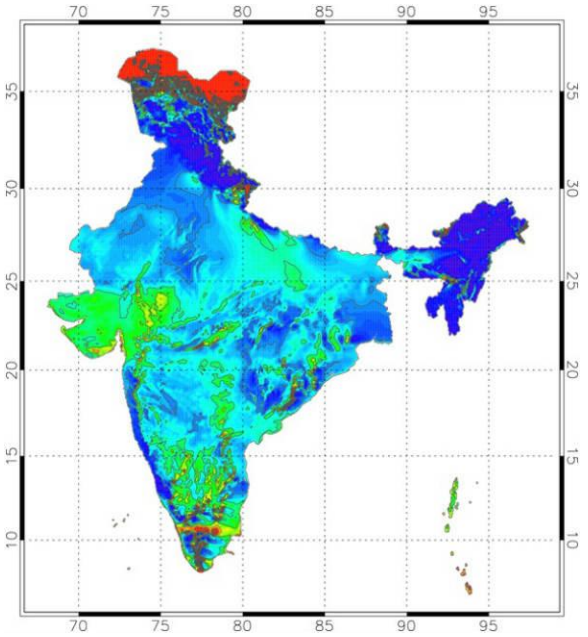
Level 3

Assumes a capacity addition in this highly optimistic scenario, to be slightly higher than the 12/13th Plan requirements resulting in 62 GW in 2022. However this would still not be enough to meet the NAPCC targets of 2020. It would cross the 100 GW mark just before 2030 and finally reach 270 GW by 2047. The resulting generation would be to the tune of 665 TWh. Significant repowering efforts would be undertaken in this level and beyond.

Level 4

In this scenario, there is absolutely no barrier (economic, social or technical) to the growth of onshore wind power. There is a sharp drop in wind prices coupled with significant increases in fossil fuel prices, especially coal. Fossil fuel externalities are priced. Smart grids, Demand response and storage is in place. Similarly, forecasting/dispatch and reliable grid integration is taken care of. Energy security is consciously factored in energy planning and land is not a constraint. In this level, capacity increases to 82 GW (172 TWh) by 2022 in line with the NAPCC requirement of 15% by 2020 (excluding large hydro). By 2040 it reaches approximately 300 GW and by 2047 a high of 410 GW. The corresponding generation in 2047 is 1007 TWh.





Onshore wind map of India (Cwet)

Note: Please see detailed documentation for references.