Germany's Energy Talk

Article # 41

Wind Power – Graph 7

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Wind energy in Germany is similar to wind energy in India a success story. The development of the industry was very much supported through special tariffs presently at 8.19 Eurocents / kWh (= 4.4 Rs/ kWh) for plants build in 2007. The tariff is fixed for 5 years and may drop to 5.17 Eurocents (=2.79 Rs/ kWh) the next 15 years under certain conditions. However most plants will enjoy the 8.19 Eurocents over 20 years. There was never any Government investment subsidy in Germany for wind power generators but only a higher tariff as mentioned. The highest capacity single wind power plant for 2006 is a 6 MW Enercon plant while, the tallest is a 205 meter high (!) 2.5 MW Fuhrländer plant. So far 28,685 wind mills were installed with a total capacity of 20,622 MW and generation of 38,000 GWh in 2006. The long term aim is to add 20,000 to 25,000 MW wind power upto 2020. The bulk will come from offshore plants since we are running out of space with good wind conditions for onshore plants in Germany.

From the data in the graph one may calculate the average annual plant load factor PLF as 38,000,000/ (20,622 x 8760) = 21%. This is not much better than the average annual Indian plant load factor of about 17.5%. See Paper # 27 for more details.

Despite all efforts, electricity from wind in MWh amounts to only 5% of the total generation in Germany. It is pointed out again that percentage reporting of installed capacity by MW makes neither sense in Germany nor in India. It overestimates the actual contribution of wind power to the national GWh generation of electricity by a factor of 4. However, the percentage contribution of wind power in Germany will steadily go up, while it is foreseen that the percentage contribute of wind power to the power mix in India will not change much despite all efforts undertaken. The reason is that electricity consumption in Germany is forecast to grow only between 0.5% to 1% per year while India's fast paced industrialisation and urbanisation combined with all out efforts of rural electrification may see a steady 7% increase in electricity demand.

For all those who forget their engineering mathematics: If there is a 5,000 MW wind power capacity in the year 2007 and a plant load factor of 0.20 applies and installation capacity increases on the average by 12% annually over 20 years then the 2027 contribution is 5000 x $(1.12)^{20}$ x 8760 x 0.2 = 84,502 GWh to the power mix.

If there is a installed capacity of 150,000 MW of power mix at an assumed PLF of 0.7 and demand increases by 7% annually over 20 years than 150,000 x $(1.07)^{20}$ x 8760 x 0.7 = 3,559,336 GWh. Consequently the contribution of electricity from wind power is estimated to be 84,502/3,559,336 = 2.4% in the year 2027. Today it is about 1.5%.

Exponentional growth functions have never been kind to technology players who start late from zero and contribute to an existing much larger power mix, that is also fast expanding.

Graph 7: Wind energy scenario in Gemany