

Wind Power in India: behind the success story

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Context

- **India has frequent power cuts, high voltage and frequency fluctuations and an important demand-supply gap**
- **The potential for wind power in India is estimated at 45,000 MW (maybe 100,000 MW?)**

Mechanisms used to promote wind power

- **Ministry of Non-Conventional Energy Sources created in 1992**
 - clear guidelines regarding tariffs, wheeling, banking and purchase of power from wind power plants.
 - Target renewable contribution of 10% of total generation by 2012?
- **Indian Renewable Energy Development Agency (IREDA) created in 1987 to disburse required financial loans**
- **In 1992 the sector was liberalized to encourage private sector participation and was supported with fiscal incentives**
 - accelerated depreciation,
 - 5 years tax holiday,
 - no or reduced customs duty on some parts / excise duty relief
 - soft loans and foreign investment.
- **Tax exemptions and accelerated depreciation up to 80% of project cost in first year have proved successful in driving the wind power sector in India**

Success with up and down

- Important growth between 1992 to 1998 from 41 MW to 968 MW
- Period of slow down after 1998
 - Lowering of tax benefits
 - Withdrawal of third party sales in some states
 - Inadequate power evacuation facilities
 - Delay in processing of land allotment
 - Various technical problems / poor installation practices
 - Unstable policy drivers and poor payment of some State Electricity Board
- Again important growth again due to the
 - the Electricity Act of 2003
 - = shifting from state financing to commercial financing

Electricity Act 2003

- Each state should fix a quota + feed-in + competitive bidding process
 - Section 6.4:
 - a) Appropriate Commission shall fix a minimum percentage for purchase of energy from such sources **taking into account availability of such resources in the region and its impact on retail tariffs**. Such percentage for purchase of energy should be made applicable for the tariffs to be determined by the SERCs latest **by April 1, 2006**.

It will take some time before non-conventional technologies can compete with conventional sources in terms of cost of electricity. Therefore, procurement by distribution companies shall be done at **preferential tariffs** determined by the Appropriate Commission
 - b) Such procurement by Distribution Licensees for future requirements shall be done, as far as possible, through competitive bidding process under Section 63 of the Act within suppliers offering energy from same type of non-conventional sources. In the long-term, these technologies would need to compete with other sources in terms of full costs
- Progressive impact in each state when implementation of recommendations of national guideline (on top of fiscal measures)
 - Minimum rate paid by the State Electricity Board with escalating Rate
 - Minimum 20 years PPA

Factors of success of wind power in India

- **The success relies on investment by the private sector.**
 - Each investor owns specific turbines in a wind farm.
 - The latest form of investment is in wind farms run by manufacturers on behalf of investors, a kind of energy service.
- **Sales to industrial**
 - Direct sales to third parties are permitted so as to attract investments from industries that need power generation.
 - Open access is nevertheless currently restricted to each Indian regional state. A manufacturer can therefore only get electricity from wind farms implemented in the same state as his plant.

Central role of manufacturers

■ Connection

- Wind technology manufacturers are in charge of developing and running wind farms, from the wind generator to the substation.
- They also invest in the construction of the substation so as to avoid delays in connection to the transmission network. They in turn are reimbursed by the supplier.

■ Sales

- The meter located at the grid substation are sealed, maintained and calibrated by the state electricity utility, which purchases the generated electricity. Monthly metering is done in the presence of both parties.
- The level of wheeling charges is fixed by each regional state and can be as low as 2% of the energy.

Wind farm which supplies industrials in Mumbai 200 km away



Results

- India is the largest producer of wind energy in Asia and fourth in the world with more than 5,000 MW of installed wind capacity in 2005
- India now has a powerful and influential local wind power industry
 - joint venture: foreign investors + Indian partners resulting from the industrial policy of 1991
 - Suzlon, Enercon, Vestas,...