WIND ENERGY STATUS: PAKISTAN

ASIAN CLEAN ENERGY FORUM 2011
2ND ADB Quantum Leap in Wind Conference

GOVERNMENT OF PAKISTAN

June 20, 2011

The views expressed in this presentation are those of the presenter and do not necessarily represent those of the Asian Development Bank.
Power Sector Reform – Key Pillars

- Improved Governance Structure
- Supportive Legislative Framework
- Supply Side Management
- Financial Sustainability
- Demand Side Management
- Promote Private Sector Participation in the Sector
ENERGY SCENARIO: PAKISTAN

Electrical Energy Sector Overview:

◆ Total Installed Electricity Generation 19,420 MW

Capacity

- Thermal (fossil-fuels): 12,487 MW (64% share)
- Hydel: 6,480 MW (33% share)
- Nuclear: 462 MW (2% share)
ENERGY SCENARIO: PAKISTAN

- Gas: 34.3
- Hydel: 30.1
- Nuclear & Imported: 3.4
- Coal: 0.1
- Oil: 32.1
Energy Sector Overview

◆ Population: 176.34 million
◆ Electrification Rate: 62.4%
◆ Population Connected to Grid: 102.6 million
Energy Sector Overview

◆ Energy Stakeholders:
  ❖ Ministry of Water and Power
  ❖ Ministry of Petroleum and Natural Resources
  ❖ Water and Power Development Authority (WAPDA)
  ❖ National Electric Power Regulatory Authority (NEPRA)
  ❖ National Transmission and Despatch Company (NTDC)
  ❖ Private Power and Infrastructure Board (PPIB)
  ❖ Alternate Energy Development Board (AEDB)
  ❖ Pakistan Atomic Energy Commission (PAEC)
  ❖ Oil and Gas Regulatory Authority (OGRA)
  ❖ Oil and Gas Development Company Limited (OGDCL)
  ❖ Oil Marketing Companies (OMCs)
  ❖ Provincial organizations
Renewable Energy

- Yearly increase in Energy Demand: 7-10%
- Current Total Installed Capacity: 19,420 MW
- Projected Demand by 2030: 162,590 MW
- Share of Renewables by 2030: 9700 MW
  *(i.e. at least 5% share)*

* Source: Mid Term Development Framework, Planning Commission, Govt. of Pakistan
*RE POLICY: Unique Features*

- Wind Risk - responsibility of GoP
- Guaranteed Electricity Purchase
- Grid provision is the responsibility of the purchaser
- Attractive Tariff (17%-18% ROE)
- Counter Guarantee by multilaterals for first few projects
- Special Incentives by the State bank for up to 10 MW plants
- No Import Duties on Equipment
- Zero Sales Tax
- Net Metering
- Banking of Electricity
- Wheeling Provisions
- Grid Spill Over Concept introduced
- Carbon Credits

*Revised Policy expected to be submitted to CCI for approval.*
## Electricity Tariff For Wind as Determined by NEPRA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of IPP</th>
<th>Project Capacity (MW)</th>
<th>Tariff (US $ Cents per kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dawood Power Ltd.</td>
<td>49.5</td>
<td>11.87</td>
</tr>
<tr>
<td>2</td>
<td>Zorlu Enerji Pakistan Ltd.</td>
<td>49.5</td>
<td>12.1057</td>
</tr>
<tr>
<td>3</td>
<td>Arabian Sea Wind Energy Pvt. Ltd.</td>
<td>49.5</td>
<td>11.9201</td>
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<tr>
<td>4</td>
<td>FFC Energy Limited</td>
<td>49.5</td>
<td>16.109</td>
</tr>
</tbody>
</table>
Total Installed Capacity

Currently first phase of 06 MW has been installed by an IPP.

Projects in Pipeline:

<table>
<thead>
<tr>
<th>Year</th>
<th>Financial Close</th>
<th>COD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>400 MW</td>
<td>6 MW</td>
</tr>
<tr>
<td>2012</td>
<td>150 MW</td>
<td>100 MW</td>
</tr>
<tr>
<td>2013</td>
<td>300 MW</td>
<td>400 MW</td>
</tr>
</tbody>
</table>

IPPs expected to achieve Financial Close for 50 MW each this year:

i. FFC Energy Ltd.
ii. Zorlu Enerji
iii. CWE
iv. Tenaga Genarasi
v. Fauji Foundation (100 MW)
vi. Lucky Energy
vii. Gul Ahmed Power
viii. Metro Power
Wind Resource Potential

- 70,000 – 80,000 MW harnessable potential
- 50,000 MW in Gharo-Keti Bandar and Jhampir corridors.
  - Average Wind Speed 7+ meters/sec
  - At 60 m height

Sites in Baluchistan, Punjab and Northern Areas being identified
Pakistan Wind Map
Developed by National Renewable Energy Laboratory, USA
First Wind Turbine installed by M/s Zorlu Enerji at Jhampir, Thatta
06 MW Wind Power Project (Phase-1) by M/s Zorlu Enerji at Jhampir, Thatta
Next Steps

◆ Detailed Resource Mapping
  
  • In order to develop potential areas, detailed wind resource assessment is being considered

  Wind measuring masts being installed in potential areas.

◆ LAND (Availability & Security)
  
  • Several project proposals can be encouraged by availability of land.
Next Steps

◆ Tariff by NEPRA
  
  • Cumbersome cost-plus tariff determination process

  Feed-in-Tariffs being recommended in the draft RE policy.
THANK YOU