Wind Energy Production in Jordan

Workshop on RES and new technologies for energy production

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OUTLINE

- Overview: Energy Sector
- Overview: Electricity Sector
- Jordan’s National Energy Strategy
- Jordan’s Wind Atlas
  - Annual Wind Speeds
- Wind Production
OVERVIEW – ENERGY SECTOR

- Jordan highly depend on importing oil (97%) to meet its needs at cost of up to 25% of Jordan’s annual GDP.
- High cost of consumed energy
- Annual growth rate of energy and electricity demand is 4%
- The demand for primary energy was 4.7 million ton oil equivalent (TOE) in 1997 reaching 7.6 million TOE in 2009
- High annual growth of primary energy demand (5.7%)
OVERVIEW – ELECTRICITY SECTOR

- Total Installed Capacity (Conventional): 4100 MW
- Peak Load: 3300 MW
- Per Capita Electricity Consumption: 2235 KWh
- Total Electricity Generation: 17261 GWh
- Total Electricity Consumption: 14564 GWh
OVERVIEW – ELECTRICITY SECTOR

- Annual Electricity consumption in Jordan

![Bar chart showing annual electricity consumption in Jordan from 2005 to 2015. The consumption increases each year.]
JORDAN’S NATIONAL STRATEGY

- Jordan national energy strategy targets for 10% of the energy mix in 2020 comes from renewable energy.
- Capacity of: 800MW Wind and 800MW Solar

- About 1560 MW of Wind and Solar PV projects are developed or currently under development in Jordan, (412 + 116) MW operational.
JORDAN’S WIND ATLAS

- Studies of wind energy potential in Jordan (more than 20 years ago) highlighted several locations suitable for wind energy production.

- Wind Atlas of Jordan (established in 1987) indicated that some areas in the Northern and Western regions have wind speeds exceeding 7m/s.

- Sites for Wind in Jordan:
  North (Hofa, Ibrahimya and Monief),
  Middle (Tafila and Zabda) and
  South (Fujaij and Aqaba)
JORDAN’S WIND ATLAS

Princess Sumaya University for Technology - Jordan
ANNUAL WIND SPEEDS

<table>
<thead>
<tr>
<th>Station</th>
<th>Annual wind speed (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hofa</td>
<td>level = 45 m</td>
</tr>
<tr>
<td>Ibrahimya</td>
<td>level = 60 m</td>
</tr>
<tr>
<td>R. Monief</td>
<td>level = 10 m</td>
</tr>
<tr>
<td>Zabda</td>
<td>level = 50 m</td>
</tr>
<tr>
<td>Taffila 2</td>
<td>level = 45 m</td>
</tr>
<tr>
<td>Fujai</td>
<td>level = 40 m</td>
</tr>
<tr>
<td>Aqaba 5</td>
<td>level = 45 m</td>
</tr>
</tbody>
</table>
WIND PRODUCTION

- 117 MW in Tafila (since Sep 2015)
WIND PRODUCTION

- 80 MW in Ma’an (66MW operational since Sep 2016)
WIND PRODUCTION

Wind projects in south of Jordan

Installed capacity (MW)

<table>
<thead>
<tr>
<th>Project name</th>
<th>Installed capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JWPC</td>
<td>120</td>
</tr>
<tr>
<td>RAJEF</td>
<td>80</td>
</tr>
<tr>
<td>HECATE</td>
<td>40</td>
</tr>
<tr>
<td>KOSPO1</td>
<td>40</td>
</tr>
<tr>
<td>XENEL</td>
<td>40</td>
</tr>
<tr>
<td>FUJAIJ1</td>
<td>100</td>
</tr>
<tr>
<td>MAAS (Iraki Group)</td>
<td>120</td>
</tr>
<tr>
<td>King Hussein University</td>
<td>80</td>
</tr>
</tbody>
</table>
VIDEO

THANK YOU

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