Algerian PV market: guidelines for successful work in the country and the latest information on upcoming government tenders

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Outline

1) Context for renewable energy development in Algeria
2) Overview of the Algerian electricity network
3) Solar potential
4) Algerian renewable energy program
5) Regulatory framework
6) Renewable energy projects
7) Conclusion
Context for renewable energy development in Algeria
Context

- Important solar potential
- Decreasing cost of renewables
- High oil and gas prices
- Uncertainty over oil and gas reserves
- Environmental issues and sustainable development

Challenges

- Development of alternative energy sources
- Development of a renewable energy industry
- Diversification of the national economy
- Becoming an actor in the world market of renewable energy
Overview of the Algerian electricity network
# Expansion of the grid

<table>
<thead>
<tr>
<th>1970</th>
<th>Parameters</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>650</td>
<td>Installed capacity (MW)</td>
<td>11 332</td>
</tr>
<tr>
<td>1670</td>
<td>Power generation (GWh)</td>
<td>45 172</td>
</tr>
<tr>
<td>3 600</td>
<td>Transmission network (Km)</td>
<td>21 616</td>
</tr>
<tr>
<td>23 000</td>
<td>Distribution network (Km)</td>
<td>256 283</td>
</tr>
<tr>
<td>720</td>
<td>Customers (Thousand)</td>
<td>6 803</td>
</tr>
</tbody>
</table>
Growth of electricity consumption in Algeria

- Moderate growth scenario
- Strong growth scenario

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Solar potential
Solar map of Algeria

- Average solar energy of 5.70 kWh/m²/day – solar PV
- Solar potential of about 170 000 TWh/year, is about 3000 times the current electricity generation of Algeria

<table>
<thead>
<tr>
<th>Regions</th>
<th>Coastal</th>
<th>Highlands</th>
<th>Sahara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (%)</td>
<td>4</td>
<td>10</td>
<td>86</td>
</tr>
<tr>
<td>Average duration of sunshine (hours / year)</td>
<td>2650</td>
<td>3000</td>
<td>3500</td>
</tr>
<tr>
<td>Average energy received (kWh/m²/year)</td>
<td>1700</td>
<td>1900</td>
<td>2650</td>
</tr>
</tbody>
</table>
The renewable energy and energy efficiency program
Expected contribution of renewable energy in domestic power generation

- Power generation from renewable sources (TWh)
- Conventional power generation (TWh)
- Contribution of renewables
- Number of projects
The deployment of the 12,000 MW dedicated to the domestic market

Power to be installed over the period 2012-2030

- **Pilot phase** (2012-2013)
- **Initial deployment** (2014-2015)
- **Large scale deployment** (2016-2020)
- **Utility scale deployment** (2021-2030)

- 8600 MW in 2012-2013
- 36 MW in 2014-2015
- 580 MW in 2016-2020
- 2784 MW in 2021-2030

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Amount of solar power to be installed over the period 2014 - 2030

Solar PV (MW)

Solar CSP (MW)
Regulatory framework
The law n°99-09 of 28 July 1999 relative to the energy control lead to the creation of the National Fund for Energy Efficiency (NFEE)

The law n°02-01 of 5 February 2002 regarding the electricity and the public distribution of gas

The law n°04-09 of 14 August 2004 with regard to the promotion of renewable energy

The Finance Act 2010 lead to the creation of National Fund for Renewable Energy (NFRE)

Executive Decree no. 13-218 of 18 June 2013 relating to feed-in tariffs

Ministerial order of 2 February 2014 fixing the tariffs for PV
## Solar PV feed-in-tariff

<table>
<thead>
<tr>
<th>Adjustment limit</th>
<th>Number of hours in operation kWh/kW/Y</th>
<th>1 to 5 MW</th>
<th>&gt; 5 MW</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Phase I US$/kWh</td>
<td>Phase II US$/kWh</td>
</tr>
<tr>
<td>-15%</td>
<td>1275-1349</td>
<td>0.20</td>
<td>0.25</td>
</tr>
<tr>
<td>-10%</td>
<td>1350-1424</td>
<td>0.20</td>
<td>0.23</td>
</tr>
<tr>
<td>-5%</td>
<td>1425-1499</td>
<td>0.20</td>
<td>0.22</td>
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<tr>
<td>Reference output</td>
<td>1500-1574</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td>+5%</td>
<td>1575-1649</td>
<td>0.20</td>
<td>0.18</td>
</tr>
<tr>
<td>+10%</td>
<td>1650-1724</td>
<td>0.20</td>
<td>0.16</td>
</tr>
<tr>
<td>+15%</td>
<td>≥1725</td>
<td>0.20</td>
<td>0.15</td>
</tr>
</tbody>
</table>

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Projects in progress
- A 1.1 MW solar PV plant in Ghardaïa testing four different technologies (monocrystallin, polycrystallin, amorpheus and thin film)

- 233 MW solar PV plants awarded to YINGLI SOLAR

- 85 MW solar PV plants allotted to BELECTRIC
Location of the solar PV projects

A total capacity of 318 MW

Divided into four separate lots:
Lot n°1: Highlands East (90 MW)
Lot n°2: Highlands Center (90 MW)
Lot n°3: Highlands West (85 MW)
Lot n°4: PIAT (53 MW)
Upcoming projects

A total capacity of 25 MW

Divided into 3 lots:
Lot n°1: Tindouf (09MW)
Lot n° 2: Djanet (03MW)
Lot n° 3: Tamanraset (13MW)
Solar PV panels
Conclusion

- Over the next six years, construction of 60 solar projects (54 projects in PV and 6 projects in CSP), with a total capacity of 2000 MW

- The global cost of the renewable electricity program is expected to reach between 60-100 billion US dollars

- Expected volume of natural gas saved, over the period of 2011 and 2030, from the renewable power plants in operation is 280 billion m³
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