The Electric Power System

- ALGERIA -
Basic facts

- Area: 2,382,000 km²
- Population: 39,928,947 (2014)
- Number of electricity consumers: 7.5 millions
- Number of TSOs: 01
- Number of DSOs: 04
- Peak load: 11,188 MW
- Average interruption of electricity: 39 min (2014)
Global map of the grid and of its interconnections

- Interconnectors with:
  - Tunisia
  - Morocco
Grid facts and characteristics

- The electricity grid in Algeria is sub-divided into transmission grids (High voltage) and distribution grids (Medium and low voltage)

<table>
<thead>
<tr>
<th>Voltage Level</th>
<th>Total length</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission Grid</td>
<td>400kV</td>
<td>2872 Km</td>
</tr>
<tr>
<td>Transmission Grid</td>
<td>150 to 220 kV</td>
<td>13390 Km</td>
</tr>
<tr>
<td>Transmission Grid</td>
<td>60 kV to 90kV</td>
<td>10398 Km</td>
</tr>
<tr>
<td>Medium Voltage</td>
<td>10 kV to 30 kV</td>
<td>131 213 km</td>
</tr>
<tr>
<td>Low Voltage</td>
<td>220V to 380 V</td>
<td>159 721 km</td>
</tr>
</tbody>
</table>
Structure of electrical power system
(interconnected Grid)

- **400 kV**
- **Conventional Generation**
- **TSO**

- **220 kV**

- **60 kV or 90 Kv**

- **30/10 kV**
  - **380 V or 220 v**
    - **Households**

- **150 kV**

- **Bulk-Industry**

- **Industry**

**Algeria Power System**
Structure of electrical power system (Isolated Grids)

TSO-Grid

Conventional Generation

220 kV

30 kV

Households

DSO-Grid

Renewable generation

5 or 10 kV

220 V

Algeria Power System
Map of the high voltage grid
Information on TSO(s)

- Name: GRTE
- Network length (km) : 26659 km
- Annual transmitted energy (TWh) : 57 TWh
- Website: http://www.grte.dz
Cooperation of TSO and DSOs

- In case of (n-1)-security violations in the EHV-grid due to a trip of several lines or the outage of a power plant TSO and DSO collaborate to manage the incident. TSO and DSOs operate measures according to internal procedures.
Responsibilities of TSO & DSOs in the interconnected grid

- **TSO**
  - Monitoring the overall system
  - GRTE Responsibility for Security of supply
  - Generators on TSO-Level

- **DSO**
  - Monitoring own system
  - DSO operate the cascade in case of emergency level

- **Cascade**
  - Support of TSO to Security of Supply through decreasing / increasing the power of generation units

- **Consumers**
  - Support of industrial customers through decreasing / increasing load
  - End user can be disconnected (load shedding)

- **Generation facilities**

Algeria Power System
Power structure of the country

- Combined Cycle: 27.0%
- Gaz: 53.2%
- Hydro: 1.4%
- Oil: 2.0%
- Hybride: 0.9%
- Wind: 0.064%
- Photovoltaics: 0.006%

Photovoltaics: 15.3%
Energy production with reference to primary reources

- Combined Cycle: 47.00%
- Gaz: 33.40%
- Hydro: 0.30%
- Oil: 0.40%
- Hybride: 2.00%
- Wind: 0.002%
- Photovoltaics: 0.002%

GWh
Development of generation capacity since 2010 (MW)
Location of renewable energy sources under construction
Development of photovoltaic power

| Source: www.sonelgaz.z

<table>
<thead>
<tr>
<th>2015-2020</th>
<th>2021-2030</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td>Photovoltaïque</td>
<td>3 000</td>
<td>10 575</td>
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<tr>
<td>Eolien</td>
<td>1 010</td>
<td>4 000</td>
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<tr>
<td>CSP</td>
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<td>640</td>
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<tr>
<td>Géothermie</td>
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<td>10</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4 525</td>
<td>17 475</td>
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