The Electric Power System

- Ireland -
Basic facts

- Area: 70,273 km²
- Population: 4.6 million
- Number of electricity consumers: 2,236,000
- Number of TSOs: 1 - EirGrid
- Number of DSOs: 1 - ESB
- Peak load: 5090 MW
- Average interruption of electricity: 0.918 System Minutes
Global map of the grid and of its interconnections

East West Interconnector connects Ireland to Wales
- Rated +/- 500MW
- Technology HVDC VSC

Ireland and Northern Ireland are connected by a double circuit AC 275kV line and two standby 110kV lines

Moyle HVDC Interconnector is part of the Northern Irish Power System
Map of the high voltage grid
Ireland's electricity grid consists of a transmission grid (High Voltage) and distribution grids (Medium & Low Voltage).

<table>
<thead>
<tr>
<th>Voltage Level</th>
<th>Length (approx.)</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission grid</td>
<td>400 kV</td>
<td>450 km</td>
</tr>
<tr>
<td>Transmission grid</td>
<td>220 kV</td>
<td>2,000 km</td>
</tr>
<tr>
<td>Transmission grid</td>
<td>110 kV</td>
<td>5,000 km</td>
</tr>
<tr>
<td>Medium Voltage</td>
<td>38 kV</td>
<td>6,700 km</td>
</tr>
<tr>
<td>Medium Voltage</td>
<td>20 kV</td>
<td>45,000 km</td>
</tr>
<tr>
<td>Medium Voltage</td>
<td>10 kV</td>
<td>47,500 km</td>
</tr>
<tr>
<td>Low Voltage</td>
<td>230 V &amp; 400 V</td>
<td>240,000 km</td>
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</tbody>
</table>
Information on TSO(s)

- Name: EirGrid
- Network length (km) 7,950
- Served area (km²) 70,273 km²
- Annual transmitted energy (TWh) 26
- Website: http://www.eirgrid.com
Cooperation of TSO and DSOs

In Ireland, the transmission network is planned and operated by EirGrid. The distribution network is planned and operated by ESB Networks. TSO and DSO cooperate in operating the power system and have several interface agreements and operating protocols. The TSO dispatches generation units >5MW on the distribution system.

The Grid Code and Distribution Code set the rules for all users of both systems.
Responsibilities of TSO & DSOs

- The TSO plans and operates the Transmission System. The transmission system transports the electricity, generated by generating units, to and from the Distribution System and to large customers connected to the Transmission System. The TSO is responsible for the central dispatch of all generation on the transmission system and units >5MW connected directly to the Distribution System. EirGrid holds the TSO licence.

- The DSO is responsible for operating the distribution system in accordance with its DSO licence obligations. The Distribution System transports electricity to or from the Transmission System or from Generation Units to the final Customer. ESB Networks holds the DSO licence.

- Suppliers supply electricity to Customers. For this purpose, suppliers are entitled to use both the Transmission System and the Distribution System for the transport of electricity from Generating Units to Customers.

- Generators generate electricity which is fed onto the Transmission or Distribution Systems. Generating Units are classified according to their voltage, output power and whether or not they are subject to central dispatch by the TSO.

- The Commission for Energy Regulation regulates the electricity industry.

- The Single Electricity Market (SEM) Committee regulates the all-island electricity market.
Installed Capacity 2015

Total Installed Capacity 10,108 MW

- Gas: 42%
- Wind: 24%
- Oil & Diesel: 9%
- Coal: 8%
- Renewable non wind: 4%
- Peat: 3%
- HVDC: 5%
- Pumped Storage: 3%
- Demand Side: 2%

Ireland Power System
Production Fuel Mix 2015

- Renewable Hydro: 2.7%
- Wind: 19%
- Coal: 15%
- Gas: 44%
- Net Import: 8%
- Peat: 10%
- Other Renewable: 0.7%
- Waste: 0.5%
- Oil: 0.1%

Total: 26 TWh

Consumption: 99%
Ireland Fuel Mix 1990-2013
Electricity Wholesale Market

- Single Electricity Market – SEM operational since 1st November 2017
- Ex-Post Pricing
- Gross Mandatory Pool
- Single Market in Ireland and Northern Ireland
  - Dual Currency
- Capacity Market
- Demand Side Participation increasingly active