



The Electric Power System

- Ireland -



Basic facts

<input type="checkbox"/> Area:	70,273 km ²
<input type="checkbox"/> Population:	4.6 million
<input type="checkbox"/> Number of electricity consumers:	2,236,000
<input type="checkbox"/> Number of TSOs:	1 - EirGrid
<input type="checkbox"/> Number of DSOs:	1 - ESB
<input type="checkbox"/> Peak load:	5090MW
<input type="checkbox"/> Average interruption of electricity: Minutes	0.918 System

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



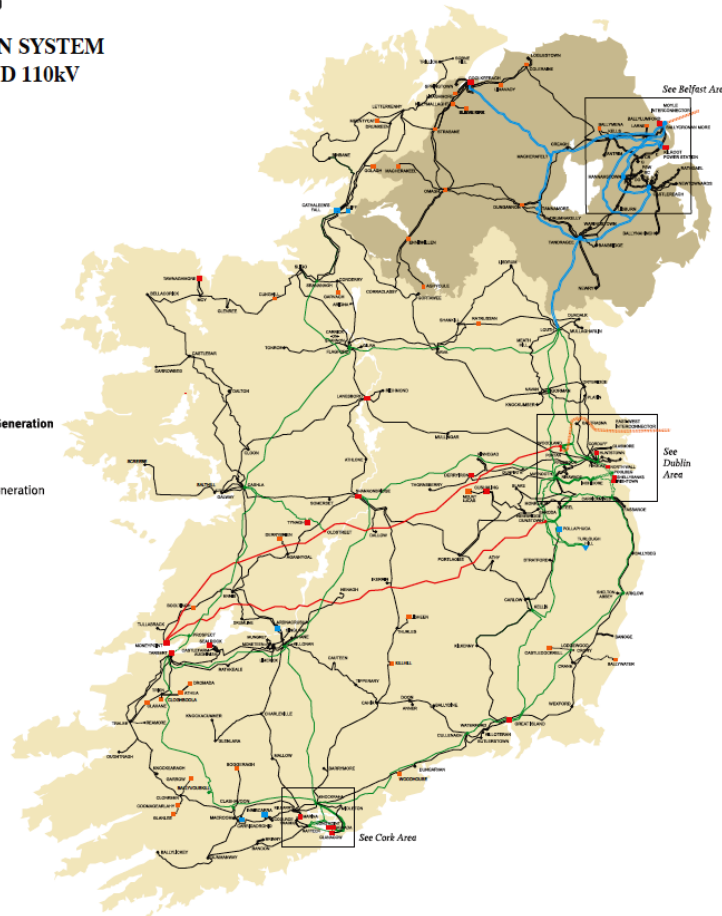
Map of the high voltage grid



TRANSMISSION SYSTEM
400, 275, 220 AND 110kV
JANUARY 2016

- 400kV Lines
- 275kV Lines
- 220kV Lines
- 110kV Lines
- - - 220kV Cables
- - - 110kV Cables
- - - HVDC Cables
- 400kV Stations
- 275kV Stations
- 220kV Stations
- 110kV Stations

- Transmission Connected Generation**
- Hydro Generation
 - Thermal Generation
 - ▼ Pumped Storage Generation
 - Wind Generation



Grid facts and characteristics

- ❑ Irelands electricity grid consists of a transmission grid (High Voltage) and distribution grids (Medium & Low Voltage)

	Voltage Level	Length (approx.)	Responsibility
Transmission grid	400 kV	450 km	EirGrid (TSO)
Transmission grid	220 kV	2,000 km	EirGrid
Transmission grid	110 kV	5,000 km	EirGrid & ESB Networks (DSO)
Medium Voltage	38 kV	6,700 km	ESB Networks (DSO)
Medium Voltage	20 kV	45,000 km	ESB Networks (DSO)
Medium Voltage	10 kV	47,500 km	ESB Networks (DSO)
Low Voltage	230 V & 400 V	240,000 km	ESB Networks (DSO)



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

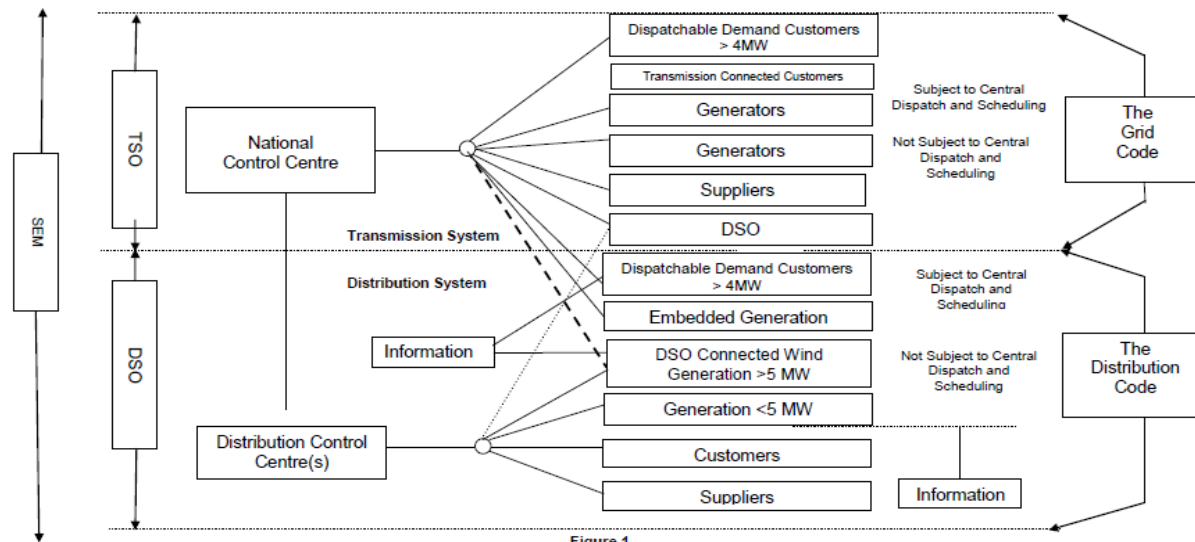


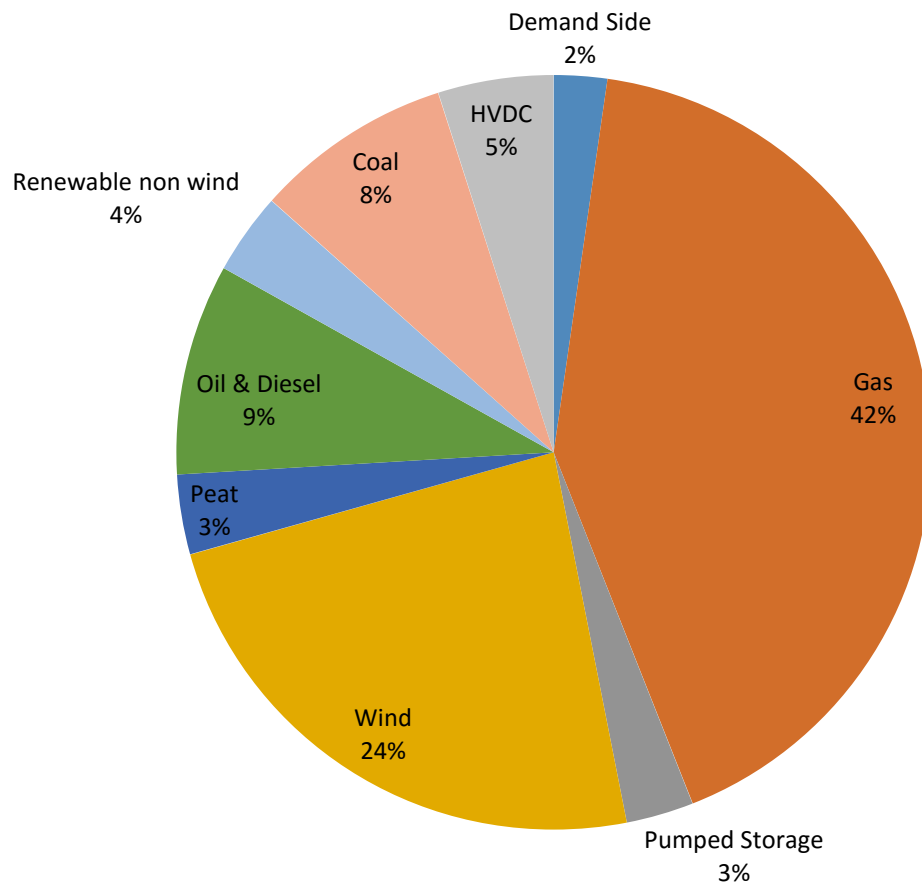
Figure 1

Responsibilities of TSO & DSOs

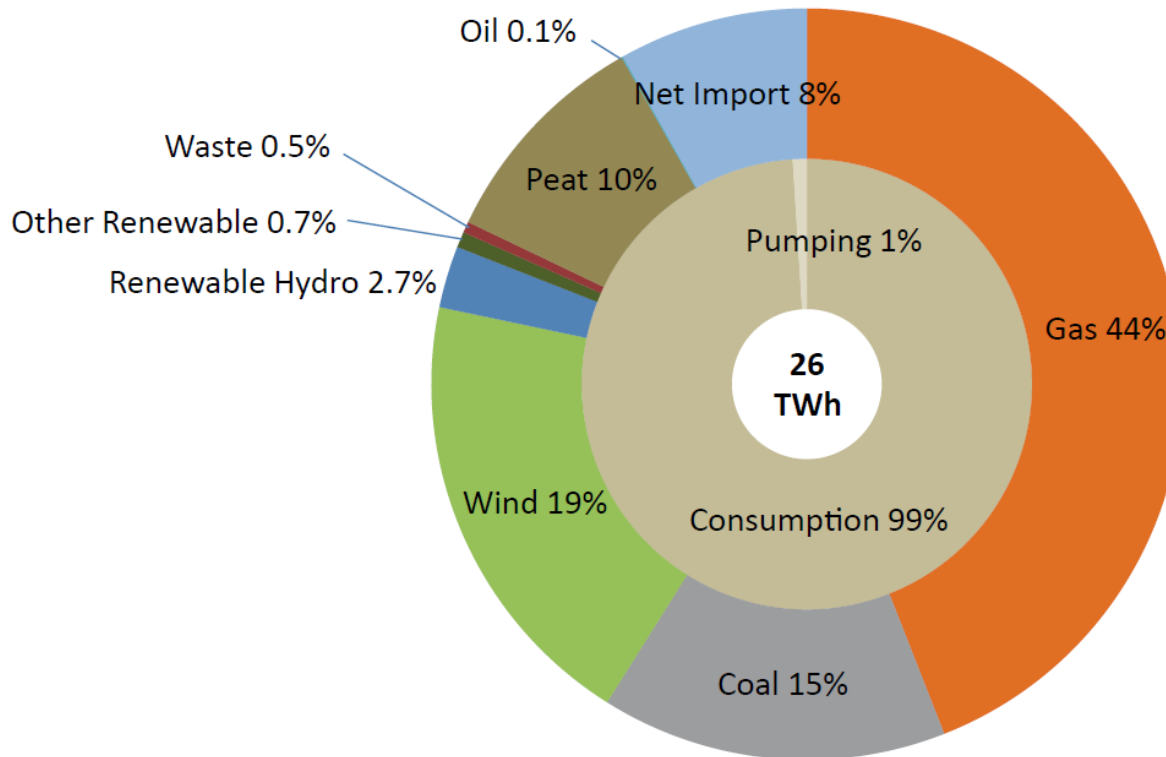
- ❑ The TSO plans and operates the Transmission System. The transmission system transports the electricity, generated by generating units, to and from the Distribution System and to large customers connected to the Transmission System. The TSO is responsible for the central dispatch of all generation 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

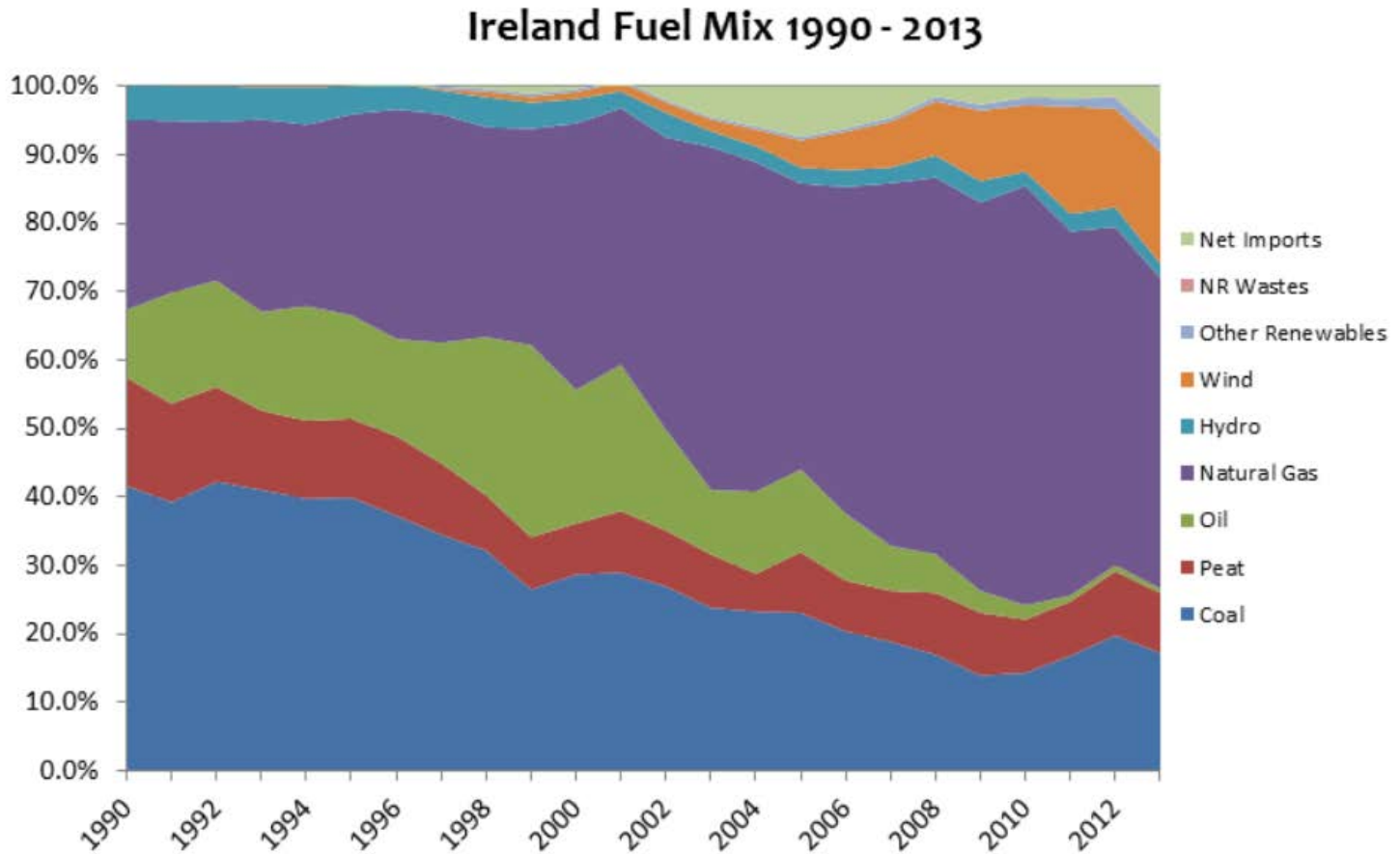
Total Installed Capacity 10,108 MW



Production Fuel Mix 2015



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