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Integrating Energy Supply and Planning

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Electrifying Heat and Transport

- Over the next decade we will be electrifying heat and transport, using electricity to decarbonise these sectors.
- By electrifying Heat and Transport we will increase electricity demand, so more electricity infrastructure will be needed.
- We will also be changing the source of electricity, and this will require significant investment in onshore and offshore wind, solar, biogas, hydrogen, and electricity transmission and distribution lines.
- This increased demand and increased reliance on electricity in our lives mean a greater volume of standard (fossil fuel) generation is needed for times of low wind and low solar



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We are
Electrifying
Heat and
Transport

• So What is changing?



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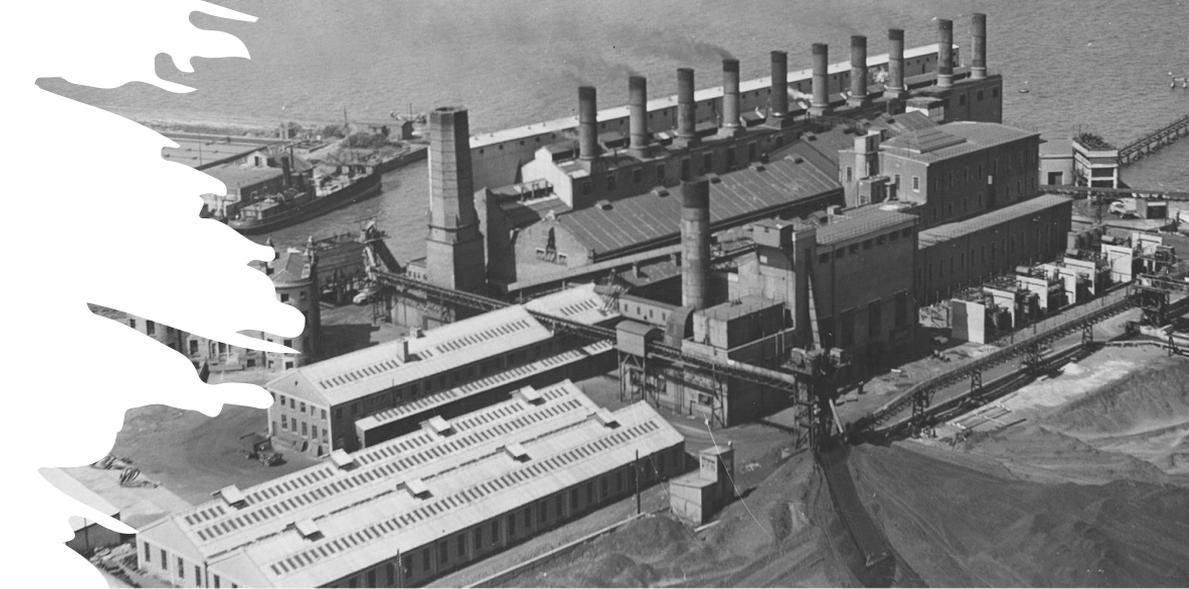
History of Oil 20th Century

- In 1902 a depot for the distribution of lamp oil and kerosene was built in Dublin, with additional depots linked to the railways.
- The first kerb-side petrol pump was introduced in Nassau Street in Dublin. Despite the interest in the automobile industry, the development of the early oil retail network still depended on the movement of oil products in barrels by horse and cart.
- An oil storage facility was first established in Foynes in the early 1900s but in a few short years, by 1906, there were fifty-one depots that supplied oil to the rapidly growing Irish motor industry and sold paraffin for lighting.
- At that time candles and paraffin oil were the most popular method of lighting, with electricity not yet widely adopted.



History of Oil 20th Century

- Historically oil was imported for use in lighting and heating
- In the early days of oil use, the main aim of oil refineries worldwide was to produce kerosene for lamp oil and petrol was a waste product to be burned off
- With the invention of the automobile and the development of road transport the demand for petrol grew
- In Ireland the oil importation and distribution industry grew rapidly on the back of the demand for road freight and passenger transport



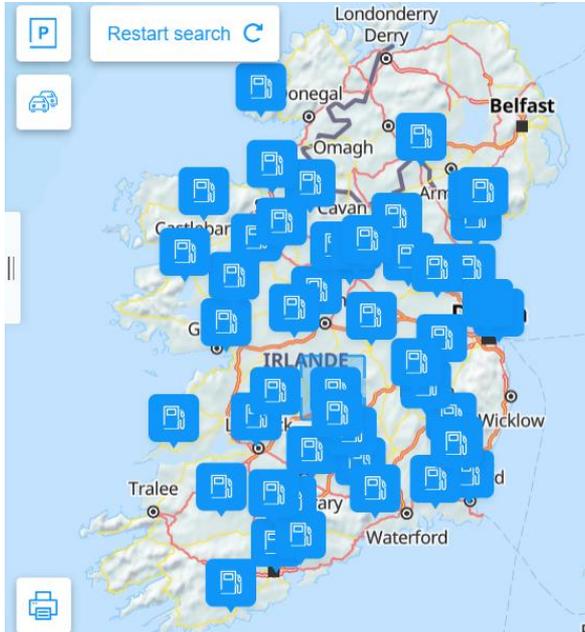


Residential Sector Heating & Transport

- According to the 2011 Census some 70% of rural homes recorded oil as their main energy source for heating with a lower percentage in urban areas (below 48%)
- While a majority of households relied on oil for heating, natural gas continued to gain market share in areas on the natural gas grid
- Energy use in the transport sector was 97.5% dependent on oil products at an estimated cost of €3.5 billion
- This was just over half the estimated total cost of fuel imports

Current Energy Sources

- All Petrol Stations in Ireland



- Where Ireland Imports Oil

| Terminal | Location | Operator | Facilities and operations |
|-----------------------|---|------------------------------|---|
| Bantry Bay | Reenour, Bantry, County Cork | Zenith Energy | Total capacity 1,400,000 m ³ , 19 tanks, size 241 to 97,675 m ³ , Single point mooring buoy. Gasoline, Diesel, jet fuel. Land area 1,397,843 m ² |
| Dublin Airport | Dublin Airport, Swords, County Dublin | Circle K | Storage 15,000 m ³ , 3 tanks, hydrant system for fuelling |
| Dublin Port | Dublin Port, Dublin, County Dublin | Valero / Applegreen | Marine terminal, common jetty. 18 storage tanks: 4 gasoline, 2 ethanol, 5 Jet A1, 6 Diesel. Terminal built by Esso 1950 |
| Dublin Port | Dublin Port, Dublin, County Dublin | Irving Oil | Vessels to 55,000 Dead Weight Tonnes (DWT) |
| Foynes | Foynes, County Limerick | Atlantic Fuel Supply Company | Total storage capacity 84,000 m ³ , 18 tanks, 2 jetties, vessels up to 35,000 DWT. Diesel, ethanol, FAME (biodiesel), fuel oil, gas oil, jet fuel, gasoline, petrol |
| Galway | Galway Harbour Enterprise Park, Galway, County Galway | Circle K | Total capacity 50,995 m ³ , 25 tanks. Petroleum products, bitumen. Vessels 4,000 to 6,000 DWT. Built 2009. |
| Shannon Foynes Port | Foynes, County Limerick | Exolum | Total storage 14,235 m ³ , 13 tanks, 750 m ³ to 3,500 m ³ . Oil products and ethanol. Maximum 10,000 DWT |
| Tarbert power station | Tarbert, County Kerry | SSE | Four Heavy fuel oil tanks leased by NORA |
| Whitegate refinery | Whitegate, East Cork, County Cork | Irving Oil | Tank farm associated with Whitegate oil refinery |



New Infrastructure

- Essentially replacing the existing infrastructure with new infrastructure which will require planning
- This infrastructure will be new wires across the country
- New Gas Pipelines to feed back-up generation
- New Wind farms
- New Solar Farms
- New Biogas Production Facilities
- New Hydrogen Facilities
- New Fossil Fuel Standby Power Generation



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At the same time there is significant demand growth outside of heat and transport
We need to make new demand growth low or zero carbon



13. Prior to the commencement of development, the applicant shall submit for the written agreement of the Planning Authority details of a Corporate Purchase Power Agreement that the developer has entered into which demonstrates that the energy consumed by the development on site is matched by new renewable energy generation in line with the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy. The Agreement shall comply with the following:
- a) The new renewable energy projects shall not be supported by government, consumer or other public subsidies;
 - b) The new renewable energy projects shall be located in Ireland and full details of these including consent details shall be provided;
 - c) The new renewable energy projects shall be provided by the applicant's group, that is Amazon.com, Inc.
 - d) The new renewable energy generation shall relate to energy that is not being generated at the date of grant of this permission.
 - e) The amount of electricity generated by the new renewable energy projects shall be equal to or greater than the electricity requirements of the data centres in operation at any given time.
 - f) The new renewable energy projects shall be fully operational prior to the commencement of operation of the data centres having regard to the phased nature of the proposed development.

REASON: In the interests of sustainable development.



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Government Policy Calls for:

- New renewables
- New transmission Infrastructure
- New stand-by power generation



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New Infrastructure

- New wires across the country
- New onshore wind farms and solar farms
- New biogas production facilities
- New hydrogen facilities
- New stand-by power generation
- **All of these will need to go through the planning system in the next decade – completely changing a system that evolved over the past 100 years**



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Thank You



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