Irish Gas Market Developments

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Introducing Gas Networks Ireland
Journey to High Performing Utility

1970s
- Natural Gas Discovered Off Kinsale
- Bord Gáis Éireann established by Government as a limited company
- Natural Gas Delivered to Cork

1980s
- Cork – Dublin Pipeline built and gas delivered to Dublin, Limerick, Waterford, Kilkenny, Dundalk
- Dublin Gas, Cork Gas and other local gas distribution companies join Bord Gáis Éireann

1990s
- Built 1st subsea Interconnector pipeline to deliver UK gas for Ireland’s growing gas demand
- Third Party Access introduced – Large Customers use Bord Gáis network for own supply

2000s
- €1.4B Infrastructure Programme – One of the largest in Irish history: Interconnector 2, Gas to the West, Mayo Galway Pipeline, Two Northern Ireland Pipelines
- CER Setup in 2002 & First Regulated Price Control in 2003
- Full Market Opening for Irish Gas Market ahead of EU Deadlines

2010s
- Networks transformation to high performing utility puts asset management and customer service at centre of business
- New organisation structure, systems, processes and technology
Ireland’s Gas Network

Gas Networks Ireland has developed a world-class gas infrastructure across three jurisdictions, comprising of:

- An Interconnector System linking Ireland to the UK & Continental gas markets
- 2,467km transmission pipeline network
- 11,218km distribution pipeline network

Nearly 670,000 gas users in Ireland in over 161 population centres within 19 counties throughout the country.

Annual demand circa 53,000 GWh
EU Gas Market
Benefits of Gas are neither widely understood nor appreciated

- Cleanest fossil fuel
- Versatile, convenient
- Reliable
- Opportunities to mix with other gases
- Competitive, efficient, quiet
- Multiple efficient routes to market
- New indigenous supplies
- Magnet for investment
- Flexible, ideal partner for intermittent renewables

Gas is often dismissed without recognising the benefits it can and does bring
Develop the Role of Gas Today

Abundant Gas

Gas storage

Sustainable Transport

Gas thermal generation - low CO2 emissions, reliable & flexible

Growing herd, potential for increased emissions

CHP, affordable & flexible for heat & power

Adopt latest technology, switch to gas

Urban – gas fuel of choice
Developments in Gas Market

Abundant Gas

Gas storage

Sustainable Transport

Biogas injections, 100% renewable

Excess Wind Power to Hydrogen

Partner with renewables, condensing boiler, solar & heat pumps

Rural – electrification of heat

Urban – gas fuel of choice

Gas thermal generation - low CO2 emissions, reliable & flexible

CHP, affordable & flexible for heat & power
Sustained growth in Irish gas demand - average 5.1% pa
# Structure of Irish Gas Market

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
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<tbody>
<tr>
<td>Department of Communications Energy &amp; Natural Resources (DCENR)</td>
<td>Government Department - Policy</td>
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<tr>
<td>Commission for Energy Regulation (CER)</td>
<td>Regulator</td>
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<tr>
<td>Gaslink</td>
<td>System Operator</td>
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<tr>
<td>Gas Networks Ireland</td>
<td>Network Owner</td>
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<tr>
<td>Shippers</td>
<td>Transport gas on the network</td>
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<tr>
<td>Suppliers</td>
<td>Supply customers</td>
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Gas has a real role to play in Ireland’s future energy mix

- There’s more to energy in Ireland than electricity
- Oil dominates primary energy supply at 47%, gas provides up to 30%
- 57% of energy consumed is oil, 16% gas, 19% electricity
- From EU Energy Roadmap 2050, electricity share of final demand will reach 39%
Gas is critical to Ireland’s economy

• Natural gas has played a critical role in Ireland’s economy since 1978.

• Ireland’s €2.8billion natural gas network supplies energy to power stations, more than 23,000 multi-nationals and businesses and over 650,000 homes.

• 60% of Natural Gas will be indigenous when Corrib comes on stream in 2015
  – Potential for more indigenous gas from additional offshore finds & biogas

• Natural gas is part of the solution to address Ireland’s energy challenges with minimal additional investment needed in existing gas infrastructure.
  – Cleanest fossil fuel (30% cleaner than oil, 60% cleaner than coal)
  – Natural gas Power Generation investments are proven as the ideal partner to intermittent wind
Correlation between Gas Use & Employment

<table>
<thead>
<tr>
<th>Company</th>
<th># Direct Employees in Ireland</th>
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<tr>
<td>intel</td>
<td>4,500</td>
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<tr>
<td>Pfizer</td>
<td>4,000</td>
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<tr>
<td>Apple</td>
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</tr>
<tr>
<td>EMC²</td>
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</tr>
<tr>
<td>MSD the world</td>
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<tr>
<td>DIAGEO</td>
<td>1,500</td>
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<tr>
<td>NOVARTIS</td>
<td>1,300</td>
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<table>
<thead>
<tr>
<th>Company</th>
<th># Direct Employees in Ireland</th>
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</thead>
<tbody>
<tr>
<td>glanbia</td>
<td>3,000</td>
</tr>
<tr>
<td>Dairygold</td>
<td>2,000</td>
</tr>
<tr>
<td>Lakeland Dairy</td>
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</tr>
<tr>
<td>CARBERY</td>
<td>580</td>
</tr>
<tr>
<td>Irish Distillers</td>
<td>530</td>
</tr>
<tr>
<td>NUTRICIA</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>300</td>
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- Significant energy costs make competitive gas offering important.
- These companies need gas – electricity cannot substitute.

Source: Company websites/other
Natural Gas & Competitiveness

• Natural Gas is cheaper than oil & cheaper than electricity for heating and cooking
• Irish Natural Gas prices are lower than EU average (Electricity prices are above EU average)
• Ireland will benefit from cheaper international gas prices via LNG once USA starts exporting gas
• Total cost of natural gas has fallen since 2006 (prices up by 14% but demand down by 25%)
• Lower fuel costs tackling fuel poverty through energy efficiency savings and flexible Pay As You Go solution
• Flexibility through pre-payment meter arrangements, enabling households to budget more effectively
• Driving residential gas connections to generate potentially between 400 and 1,200 direct jobs through boiler conversions, increase network utilisation and benefit end consumers through tariff reductions
• Compressed Natural Gas (CNG) for transport through the establishment of a national refuelling station network to offer significant savings over Diesel
Natural Gas & Sustainability

- Natural gas is a clean, efficient, flexible, cost effective fuel suitable for power generation, industrial, commercial, domestic and transport use.

- Converting 100,000 homes from oil boilers to gas will increase boiler efficiency by 10%, reduce carbon dioxide (CO$_2$) emissions by 30% and put €70m back into the economy from fuel savings.

- Biogas development in Ireland could deliver substantial direct and indirect employment opportunities
  - underpin investment by multi-national companies operating in Ireland,
  - Circa 2,500 direct and 4,000 indirect jobs could be created over a 10 year period through the development of biogas in Ireland.

- Gas as a fuel for transport (compressed natural gas)
  - possible to reduce CO2 emissions by 20% and 10% in noise pollution
  - Transport makes up 20% of CO2 emissions – converting 20,000 buses/trucks/vans to natural gas could reduce transport emissions by 20% (4% off overall)

- Ideal partner to intermittent wind
Gas Security Not a Critical Issue

- Infrastructure - Ireland’s interconnector system provides reliable connection to Europe’s most liquid gas market

- Corrib will provide up to 60% indigenous gas to Ireland’s market

- Pricing, IEA projections are for long term gas prices to be half those for oil

- Supply - IEA estimates 250 years of global gas reserves
Increased Energy Security with Scottish Twinning

- Ireland has secured grant aid from the European Commission’s Connecting Europe Facility

- Projects of Common Interest (PCI) for energy market integration and to address security of supply

- EU grant of €33.8m towards costs of twinning South West Onshore Scotland pipeline

- Positive development for Irish gas industry and timely endorsement of natural gas
Maximise the existing energy network

Current uses of natural gas

Future uses of natural gas

Introduction of biogas

Decarbonisation

Fuel to Power Stations

Fuel for existing Heating

Urban fuel of choice – new gas customers

CNG for buses, trucks and captive fleets

Harvest 2020

2nd Generation Biogas

3rd Generation Biogas

‘Sweat’ the existing assets

Infill existing areas

Develop new areas
Export potential – access to EU Gas Market
Exporting Irish Natural Gas to UK & European Markets

- Future Irish natural gas supply may exceed demand on the island

- EU driven market test to assess market demand for Irish gas exports will determine appetite to facilitate Physical Reverse Flow.
  - Capital investment also required

- Market tests will be carried out at the request of the Competent Authorities – Department of Energy & Climate Change “DECC” and the Commission for Energy Regulation “CER”.

- There’s a roadmap for future Irish Offshore producers to access European gas markets.
What needs to be done?

- Increase Awareness
- Gas should underpin Ireland’s Energy Strategy
- Promote development of the competitive gas market
What can be delivered?

- More gas users – lower networks tariffs
- Major help for Ireland to meet its CO2 emissions targets
- Perfect partner to intermittent Wind
- Allow customers avail of lower gas prices
- Jobs from production
- Jobs via expanding biogas and CNG industries
- Jobs in gas boiler conversions
- Enable Ireland ‘step stone’ to sustainable future
Thank you
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