



Renewable Gas
The key to a cleaner
energy future

Irish Whiskey Association
IBEC

| Gas Networks Ireland | 25 April 2022



Gas
Networks
Ireland

Contents

- Background
- Renewable Gas Policy Landscape
- Biomethane
- Hydrogen
- Decarbonisation Journey

Proven experience and expertise in energy



Gas network of the past



Gas of the past

Town gas in Ireland dates back to 1764, when gas lighting was first produced from imported coal. The first gas mains were laid in 1824 for public lighting.

Gas network of the present



Gas of the present

Natural gas was discovered off the coast of Kinsale in the 1970s. With 40% less CO₂ than coal and 20% less CO₂ than oil, it has been decarbonising homes, businesses, industry and electricity ever since.

Gas network of the future



Gas(es) of the future

Renewable gases, such as biomethane and hydrogen will complement intermittent renewable electricity, reduce emissions across the economy, and enhance Ireland's energy security and diversity.

We have a state-owned asset of size and scale (2020)



Delivering Ireland's Energy

36%

Gas used in Ireland sourced indigenously from Corrib and Kinsale gas fields (2020)



76.3TWh

transported through the network for Ireland, Northern Ireland and the Isle of Man

2

Subsea interconnectors



14,617km pipeline

- 2,477km high pressure steel transmission pipes
- 12,044km lower pressure polyethylene distribution pipes

Delivering new connections

8,091

new commercial and residential customers connected to the network with



635GWh

new natural gas demand contracted (2020)

706,000+

customers in 22 counties, with 307 large industrial and commercial customers, including 11 power stations



519 small to medium businesses, 40 large industrial customers, 4000+ homes, 12 apartment blocks, **contracted to connect to the gas network** (2020)

Delivering for Ireland

€112m

capital expenditure

€2.7bn

publicly-owned, national asset

€447m

revenue

522

staff directly employed by Gas Networks Ireland (September 2021)



€70m

dividend payment to the Exchequer



Aurora Telecom, a division of Gas Networks Ireland, owns and operates the **most modern, carrier grade, backhaul dark fibre** network in Ireland

The reliable cornerstone of Ireland's energy mix



powering over
30%
primary energy needs



powering over
40%
of heating

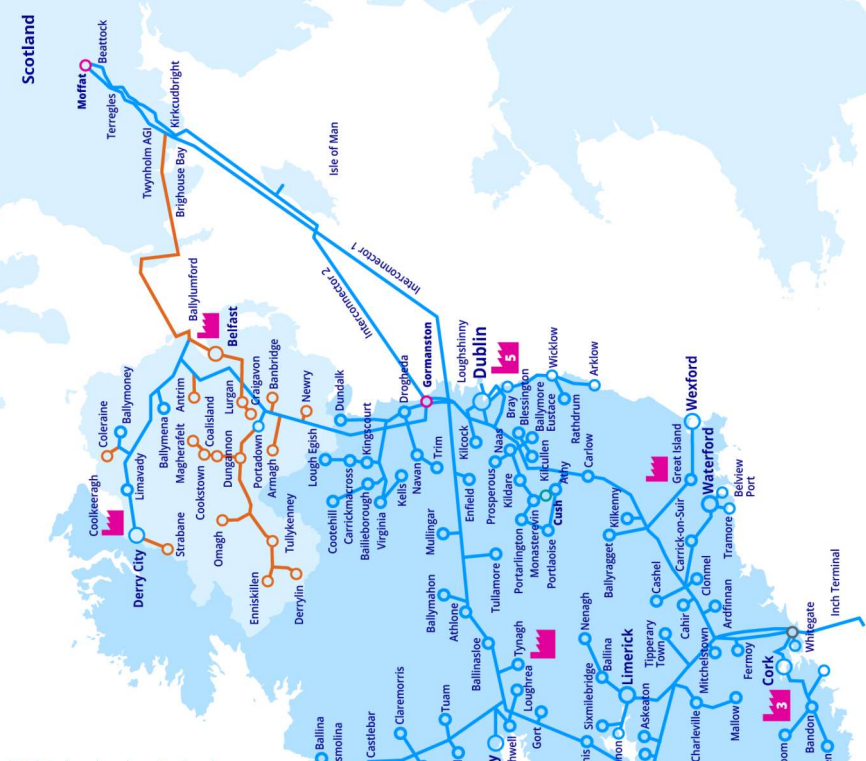


powering approximately
50%
of electricity generation⁵

The trusted backbone of Ireland's energy system



	Existing Pipelines
	Pipelines Owned by Others
	Interconnection Points
	Entry Points
	Renewable Gas Entry Point
	Decommissioned Entry Point
	Gas Fired Power Generators



Kinsale Head Gas Field } Decommissioned May 2020
Seven Heads Gas Field }



Security of supply

Large energy storage capability to meet high heat demand during extreme cold periods



Future proofed

One of the safest and most modern networks in Europe



Flexible

A secure, instantly available energy source which has made renewable deployment possible



Resilient network

Proven ability to meet demand in harshest weather conditions, ensuring security of supply



Diversity

Supplying energy for power generation, heat and transport



Renewable ready

Network capable of transporting renewable gases, such as biomethane and hydrogen

And European Policy



European Green Deal (December 2019)

Set of policy initiatives to make Europe climate neutral in 2050.



Hydrogen Strategy (July 2020)

Sets out an ambitious roadmap for developing an EU hydrogen economy by 2030.



Energy System Integration Strategy (July 2020)

Co-ordinated planning and operation of the energy system across multiple energy carriers, infrastructures and consumption sectors.



Fit for 55 (July 2021)

Provides for a 55% reduction in emissions by 2030. Target of 5.6 Mt of Hydrogen by 2030



Revision of Gas Directive and Gas Regulation Q4 2021

Facilitate the uptake of renewable and low-carbon gases and consumer empowerment while ensuring integrated, liquid and interoperable internal gas markets.



RePowerEU (Mar 2022)

Double biomethane Fit for 55 target, and if applied prorata 5.6TWh of biomethane in Ireland. Additional 15 Mt of renewable hydrogen by 2030



National & European Policy - Biomethane



Climate Action Plan

1.6TWh of renewable gas by 2030 with a review in 2023 and support for renewable gas in transport



Green Gas Certification

Legislation underway to establish the certification of origin scheme



Support Scheme

Feed-in tariff or subsidy obligation while transport and heat energy obligation scheme more likely



Northern Ireland Action Plan (Jan 2022)

Set targets for Biomethane 8 TWh for 2025 and 12 TWh for 2030



REPowerEU (March 2022)

Double the original Biomethane target \approx 11% if applied pro-rata 5.6TWh in Ireland, not legally binding



EU Horizon Programme (September 2021)

Biomethane is a renewable substitute for natural gas It is now eligible for funding



EU Taxonomy (April 2021)

The EU Taxonomy recognises anaerobic digestion and the integration of biomethane in gas grids as sustainable activities



Energy System Integration Strategy (July 2020)

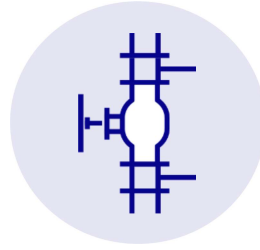
EC will re-examine gas market regulatory framework to facilitate uptake of renewable gases



EU Methane Strategy (October 2020)

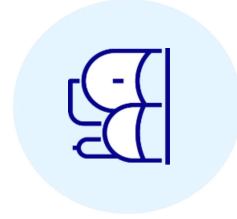
Recognises the potential of biogas and biomethane to reduce methane emissions

Biomethane



Gas connection

Proposed Connections to CRU	Total
No. of Direct Connections	20
No. of CGI	2
TWh/p.a.	1.6
Capex	€68.7m
Opex	€13.8m



Digester plant

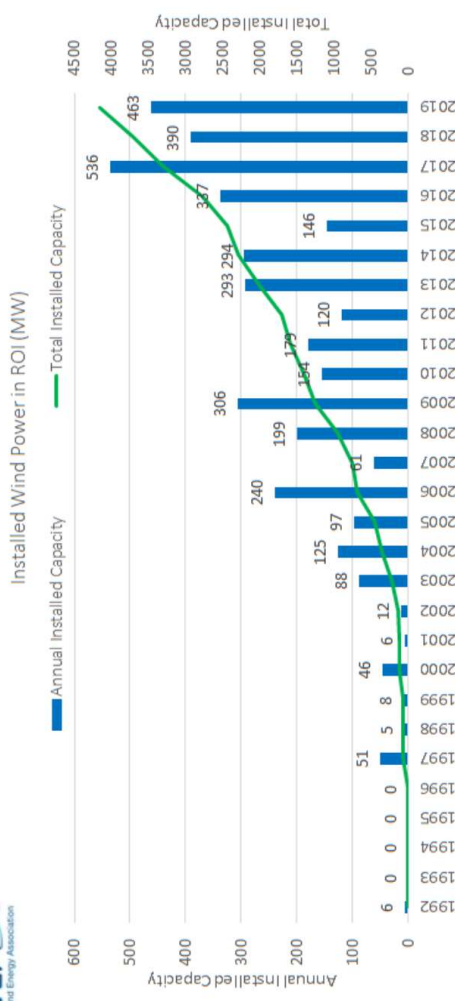
Direct Connection	Qty
Total enquiries received to-date	121

- Biomethane - Ireland recognised by the EU as having the highest per capita in the EU 27
- Ireland is a laggard, 20th out of 27 in production.
- Sufficient capacity -improved efficiency across land already in agricultural production to sustainably produce up to 9.5TWh.
- Biomethane can enhance agricultural productivity and significantly decarbonise food production, thru' carbon sequestration and avoided emissions by substituting chemical fertilisers with digestate.
- Gas Registry Activities
 - >11GWh Injected to date
 - New producer 38GWh p.a. in April 2022





Renewable Heat Obligation (RHO)

- RHO Consultation closed Oct-2021
Proposed 1.6 TWh/p.a.2030 (max 5.5. TWh?)
 - Obligation on suppliers to procure renewable heating fuels, renewable fuel certificates or pay penalty
 - Next step is to publish decision
 - Then - consultation on detailed implementation -followed by implementation, and;
 - First obligations over 3 years – 2023 to 2025.
- Biofuel Obligation Scheme operating since 2010
 - 1/7th of fuel is now biofuel - 458 million litres in 2022
 - Only 14% sourced indigenously

Similarity to other renewable industries?



A renewables-ready decarbonisation solution

	Biomethane	Hydrogen
 <p>Transmission high pressure gas network consists of steel pipelines, gas installations and storage, totalling 2,477km.</p>	Fully compatible	Adaptation of the gas infrastructure for hydrogen is technically feasible.
 <p>Distribution medium and low pressure network consisting of polyethylene (PE) pipelines, gas installations and service lines, totalling 12,140km.</p>	Fully compatible	PE pipelines are compatible with hydrogen. Investigation of the impact of hydrogen on other network materials and components.
 <p>Homes and business – Over 706,000 customers using gas for space heating, water heating and gas cooking. Existing gas appliances tested under European regulations since 1996.</p>	Fully compatible	Update of appliance testing protocols for a 20% hydrogen blend. Development of new hydrogen ready gas appliances.
 <p>Transport network of CNG stations across the country, 7 CNG stations operational in Ireland. A further 9 stations are in planning and development.</p>	Fully compatible	Update of vehicle testing protocols for a 20% hydrogen blend. Development of new hydrogen ready vehicles

Our own R&D centre in Dublin



Research
and testing



Hydrogen compatibility,
functionality and
operational procedures



Partnerships and
academic input

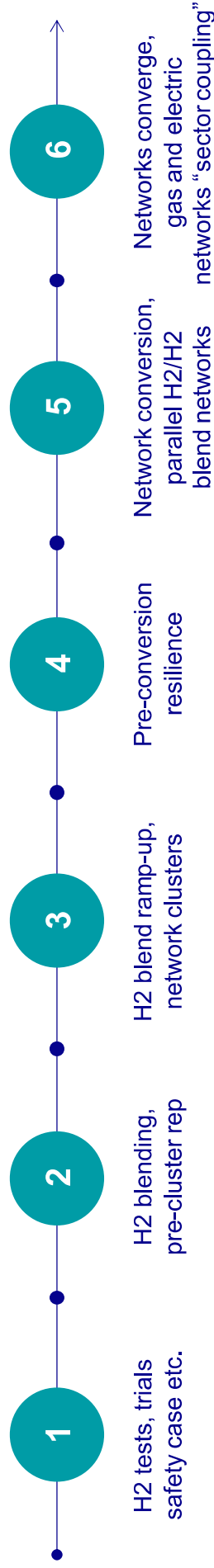


Supporting a Hydrogen
Safety Case



Training, skills
and knowledge

We're working to transform the gas network



Growing confidence in the potential for hydrogen on UK NTS



Interconnector hydrogen blend possible and growing from mid to late 2020s onwards



Interconnector hydrogen at 100% possible from 2040 onwards

A net zero gas network evolution



Network blending

Biomethane and hydrogen (with storage) displace some natural gas



Network clustering

Proximate, scale users migrate to annexed / dedicated hydrogen networks



Network converting

Hydrogen displaces all blended gas & clusters reintegrated into the network



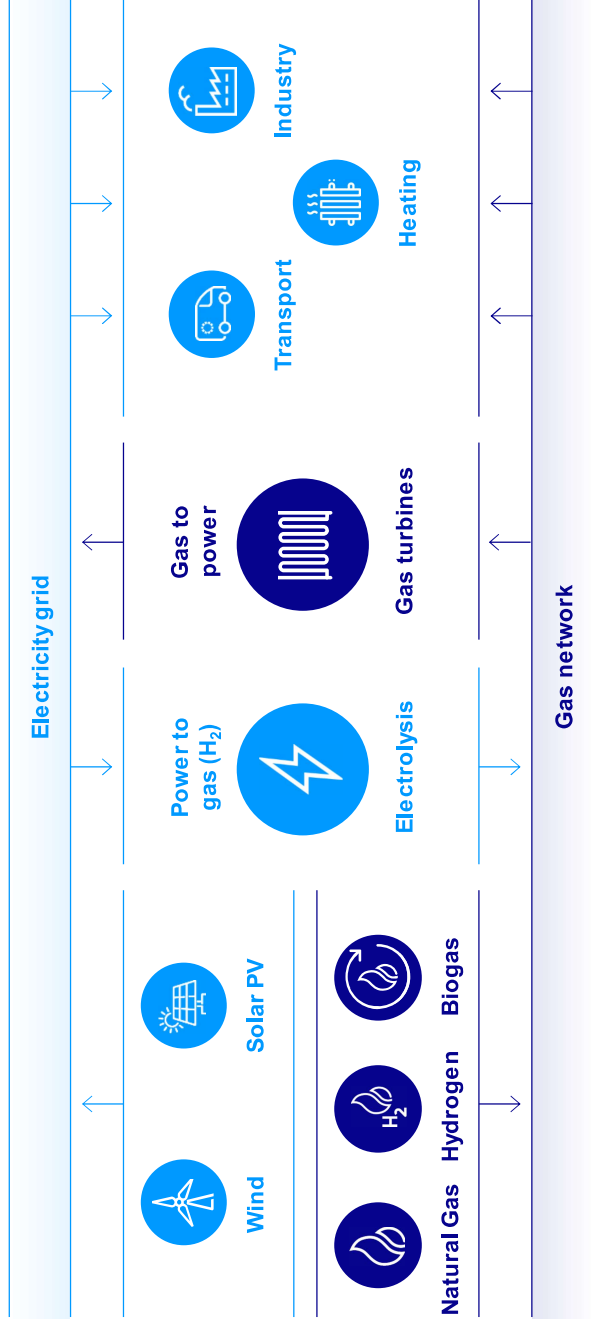
Networks converging

Hydrogen network enables full exploitation of Ireland's renewable electricity and maximum indigenous green hydrogen

And ultimately Ireland's entire energy system

- Decarbonisation of gas infrastructure and increased integration of gas and electricity systems will complete the decarbonisation of the energy system.
- Gas offers a solution for hard to reach / high energy intensity sectors.
- The gas network offers storage and security at an affordable cost.

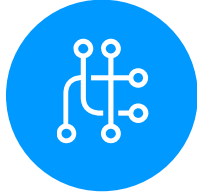
Europe's vision for future energy systems



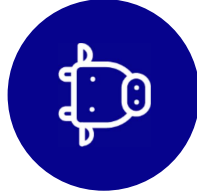
In line with the CAP Annex of Actions

Area	Steps Necessary for Delivery	Proposed Output	Timeline	Lead	Key Stakeholders
Biomethane Development	Develop biomethane grid injection infrastructure through the GRAZE Gas project with support from the Climate Action Fund	Commence operation of Ireland's first transmission-scale biomethane injection facility	Q4 2023	GNI	
Hydrogen Injection in Gas Grid	Test the technical feasibility of safely injecting green hydrogen blends in the gas grid	Completed assessment of the impacts on network operation, integrity, and end users' appliances	Q4 2022	GNI	CRU, DECC
Regulatory Framework for Hydrogen	Develop a policy/regulatory roadmap for green hydrogen use in the natural gas grid	Publish a policy/regulatory roadmap for green hydrogen use in the natural gas grid	Q1 2023	DECC	CRU, GNI
Certification Scheme for Renewable Gas	Establish an official certification scheme for renewable gas in the gas grid	Secondary legislation establishing GNI's renewable gas registration scheme	Q2 2022	DECC	CRU, GNI
Biomethane targets	Review the indicative target set for the level of biomethane in the gas grid by 2030	Review of target completed and updated if appropriate	Q2 2023	DECC	CRU, GNI
Sector integration between gas and electricity	Assess the potential for energy system integration between the electricity and gas networks including the production, storage and use of green hydrogen	Assessment of the potential for electricity and gas system integration published	Q1 2023	DECC	CRU, GNI , EirGrid, SEAI

Delivering a cleaner energy future for Ireland



Gas Networks Ireland is working to decarbonise Ireland's gas network in line with Irish and European policy.



Ireland's gas network can evolve to support a net zero 2050 and help other sectors of economy such as agriculture and transport to play their part.



Using the gas network and renewable gases to reduce emissions is part of the most affordable solution with the co-benefit of enhancing Ireland's energy security and diversity.



Renewable Gas
The key to a cleaner
energy future