A Secure Low Carbon Energy Future

with Renewable and Natural Gas

Gas Networks Ireland

Jason Hannon | May 2019

Introduction to Gas Networks Ireland

ervia

Aurora TELECOM · Gas Networks Ireland · UISCE EIREANN - IRISH WATER

€147m
capital expenditure in 2018

52%
of Ireland's electricity needs powered by natural gas

62%
ROI gas demand satisfied by Corrib

74,000GWh
of gas transported in 2017. Over twice the energy carried by the electricity network.

688,000
connections

14,172km
of gas pipeline could wrap around Ireland's coastline 4 times

100%
Reliability of our gas transmission network, including interconnectors to the UK.

1 in 50
Flexibility to meet the harshest weather events as seen in 2010 and more recently in 2018

Renewable gas injecting into the grid from 2019

20%
of Ireland's gas needs by
2030

gasnetworks.ie

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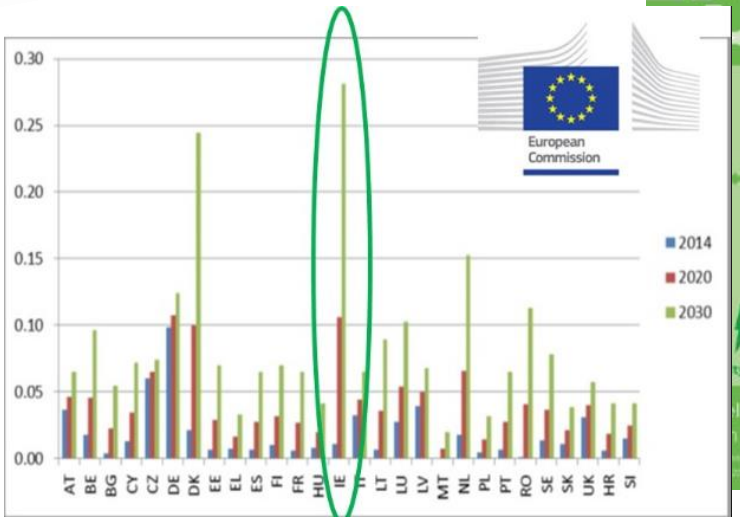
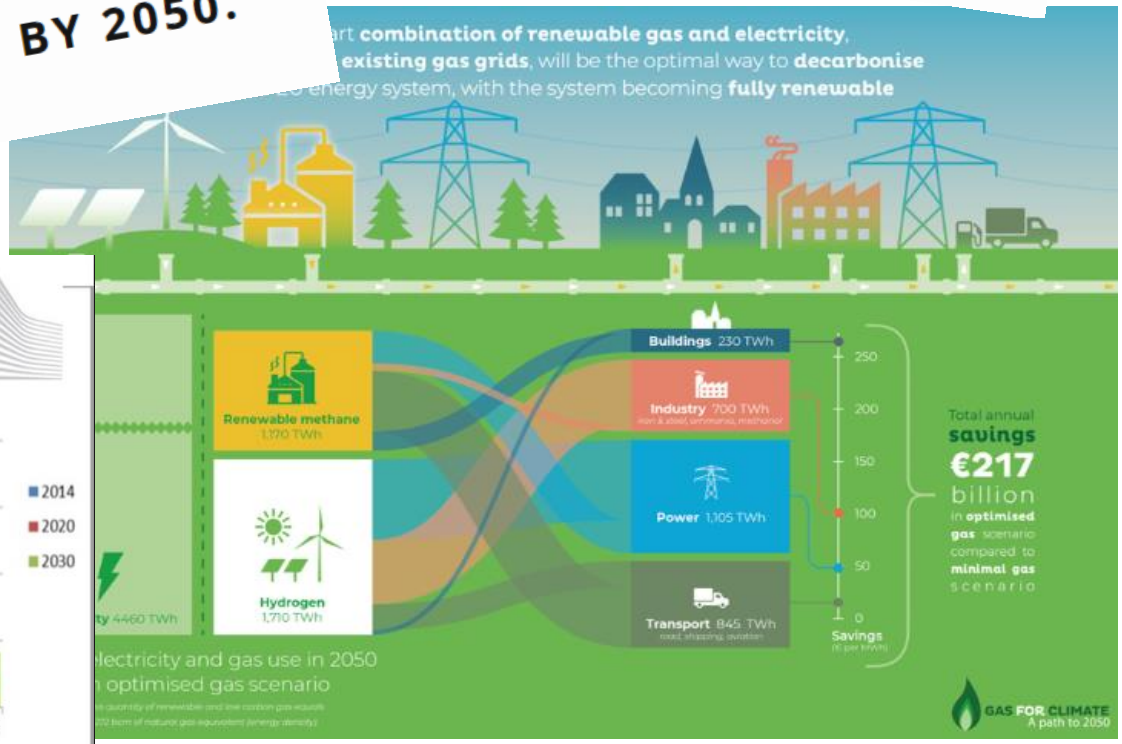
Decarbonising Gas

A fully decarbonised gas network by 2050?

Gas must be 'completely' decarbonised by 2050, says UK think-tank

6 EU GAS GRIDS HAVE COMMITTED TO 100% DECARBONISED GAS BY 2050. IRELAND MUST FOLLOW





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Decarbonizing the Gas Network

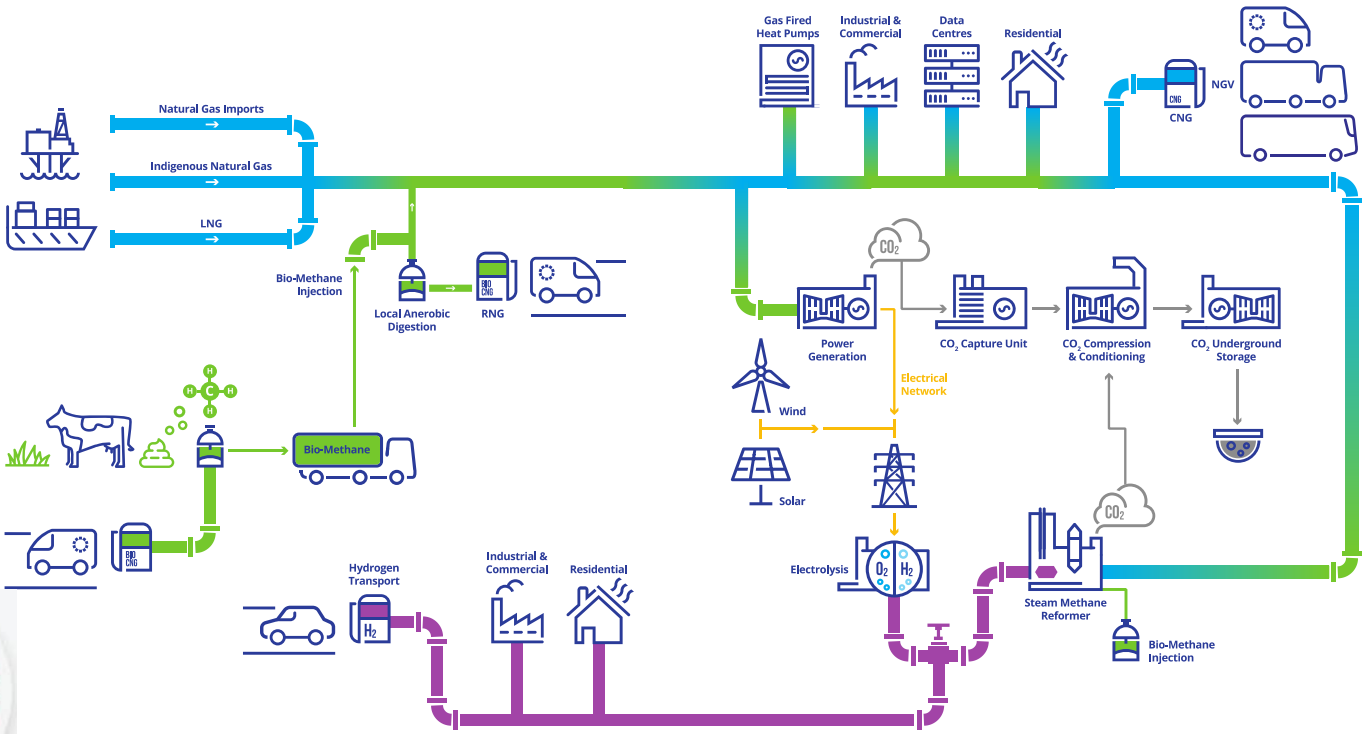
1. Natural Gas displacement of other fossil fuels

2. Biomethane

3. SMR + CCS/CCU

4. Power to Gas

5. BECCS



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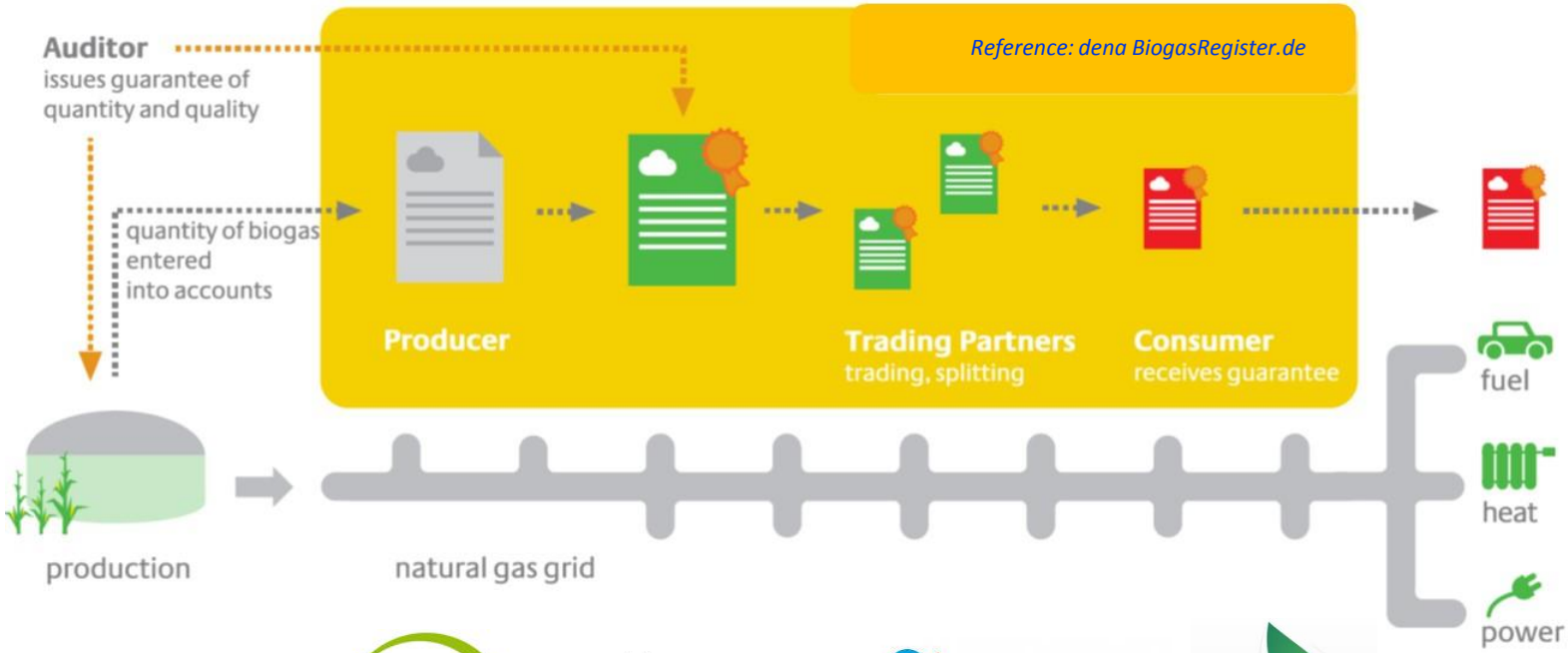
Green Gas Certification Scheme for Ireland



Causeway Project

1st National **CNG Network**

1st 100% Natural Gas **Powered Vehicles**

1st Renewable Gas **Injection Point**

€25 million project budget

Co-financed by EU

14 CNG **filling stations**

1 final network study

20% Renewable Gas by **2030**

1 Renewable Gas injection Facility

Results disseminated in Europe

1 CNG truck = 50 houses gas usage

€700k CNG Vehicle Fund

Co-financed by the Connecting Europe Facility of the European Union

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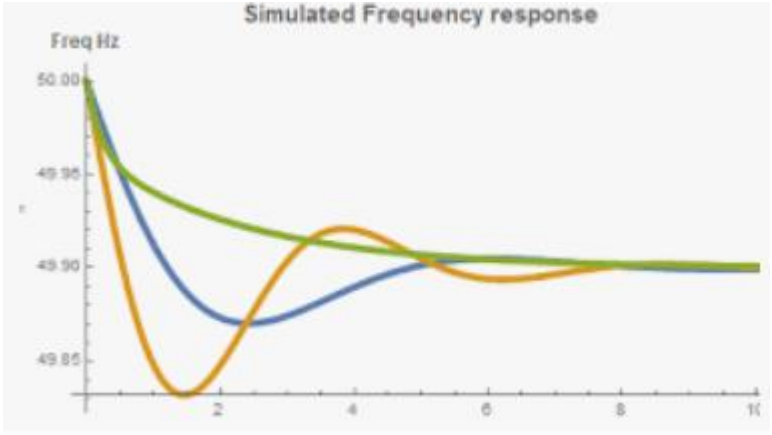
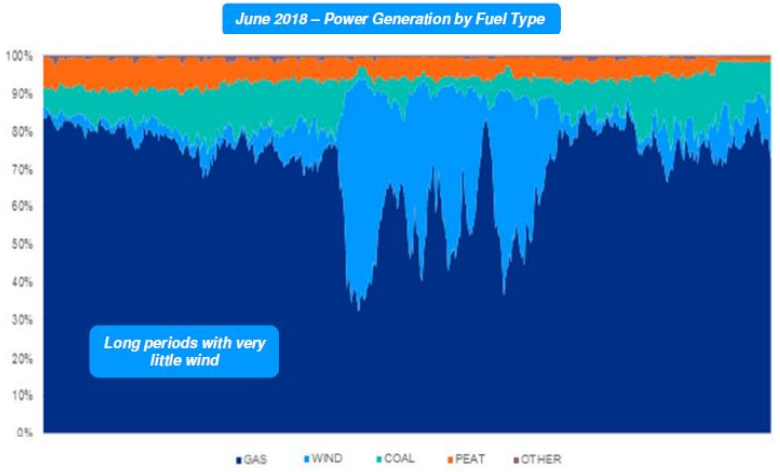
Achieving a secure low carbon economy for Ireland with Gas

Secure Low Carbon Power using gas

1. Power Systems need Synchronous Inertia for system resilience to under frequency events
2. Gas offers a controllable & dispatchable service to the electricity grid which complements variable renewables.
3. The flexibility of gas ensures the end customer can retain the commodity they want rather than being incentivised otherwise.
4. Gas will protect the end customer during those low wind weeks when batteries wont
5. The use of Power to Gas technology can facilitate storage of curtailed RES, at times of resource overload to be reused when the end customer requires it.





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Heating & Cooling

1. **Industry & Manufacturing**
   - >85% Process Heat
   - Need 100% reliable fuel source
   - Decarbonisation & CSR Targets
   - Sites often restricted on truck movements meaning biomass on site not feasible

2. **Domestic**
   - Cost to retrofit existing housing stock ~€50bn
   - ~ 50% of this at 1/3 cost If fuel switch to biomethane
   - Hybrid Heating systems – gas boilers for **peak heat** in tandem with heat pumps
   - 1 biomethane plant = 4,000 homes fully decarbonised
   - Gas network designed for **1 in 50 peak.** No issues with network capacity

Business leaders call for EU net-zero target

30 April 2019, source edie newsroom

The chief executives from more than 50 businesses, including Ikea, Unilever, Heathrow Airport and Interface have called on the European Union (EU) to create a long-term decarbonisation roadmap for a net-zero economy by 2050.

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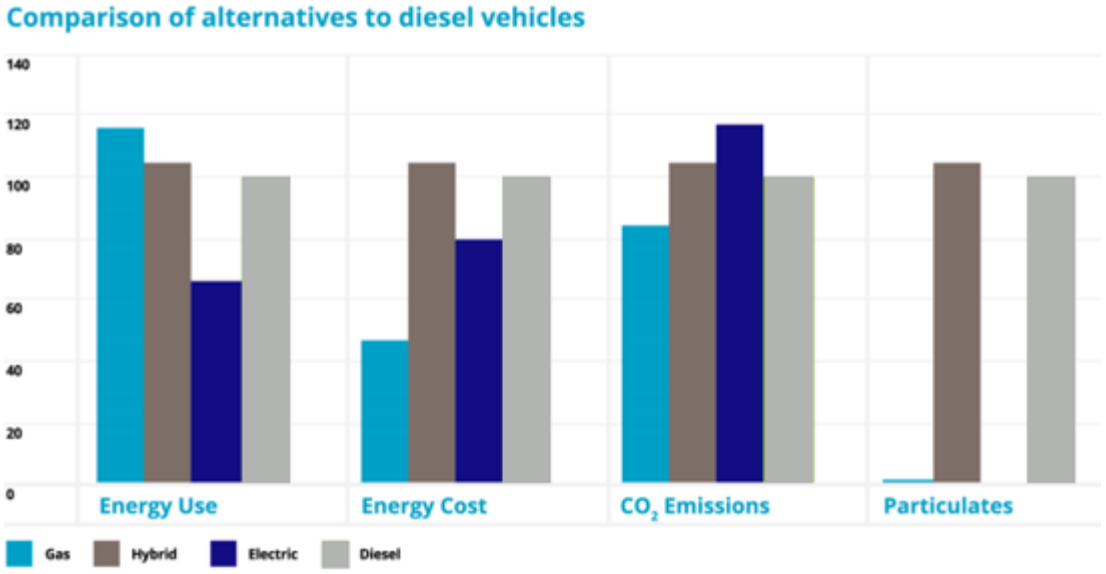
Transport – A solution for HGVs & Buses

1. **25 million** vehicles worldwide
2. Ranges & Refill times comparable with Diesel
3. Costs 35% less (typical payback in **1-3 years**)
4. Air Quality benefits
   1. 22% less CO2
   2. 70% less SOX
   3. 70% less NOX
   4. 99% less PM
   5. Up to 100% less CO2 using Renewable Gas
5. Rolling out infrastructure across the TEN-T network to ensure a reliable and secure supply for customers into the future



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Additional Benefits

Decarbonising Agriculture

Jobs & stimulating the rural economy

Realising our Rural Potential

Action Plan for Rural Development

Hydrogen required in many industrial processes

Circular economy & effective use of waste

Key Points

1. Ireland has one of the most modern and reliable gas networks in the world

2. The gas network is decarbonising with a number of pathways to achieving this

3. Gas network has significant capacity – 1 in 50 yr Peak

4. Gas will be a solution to those difficult to decarbonise sectors

5. A secure decarbonised energy system with gas is a cheaper solution than one without it