



# Biomethane in Transport

## Using the gas network to decarbonise transport

Donal Kissane Gas Networks Ireland

# Gas Networks Ireland at a glance

**52%**

of Ireland's electricity needs powered by natural gas



**680,000**

connections



**72,512GWh**

of gas transported in 2016. Over twice the energy carried by the electricity network.

**13,954km**

of gas pipeline could wrap around Ireland's coastline 4 times

**100%**

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

Renewable gas could provide

**20%**

of Ireland's gas needs by 2030

**20**

counties serviced by natural gas



# European & National Policy - Alternative Fuels Directive



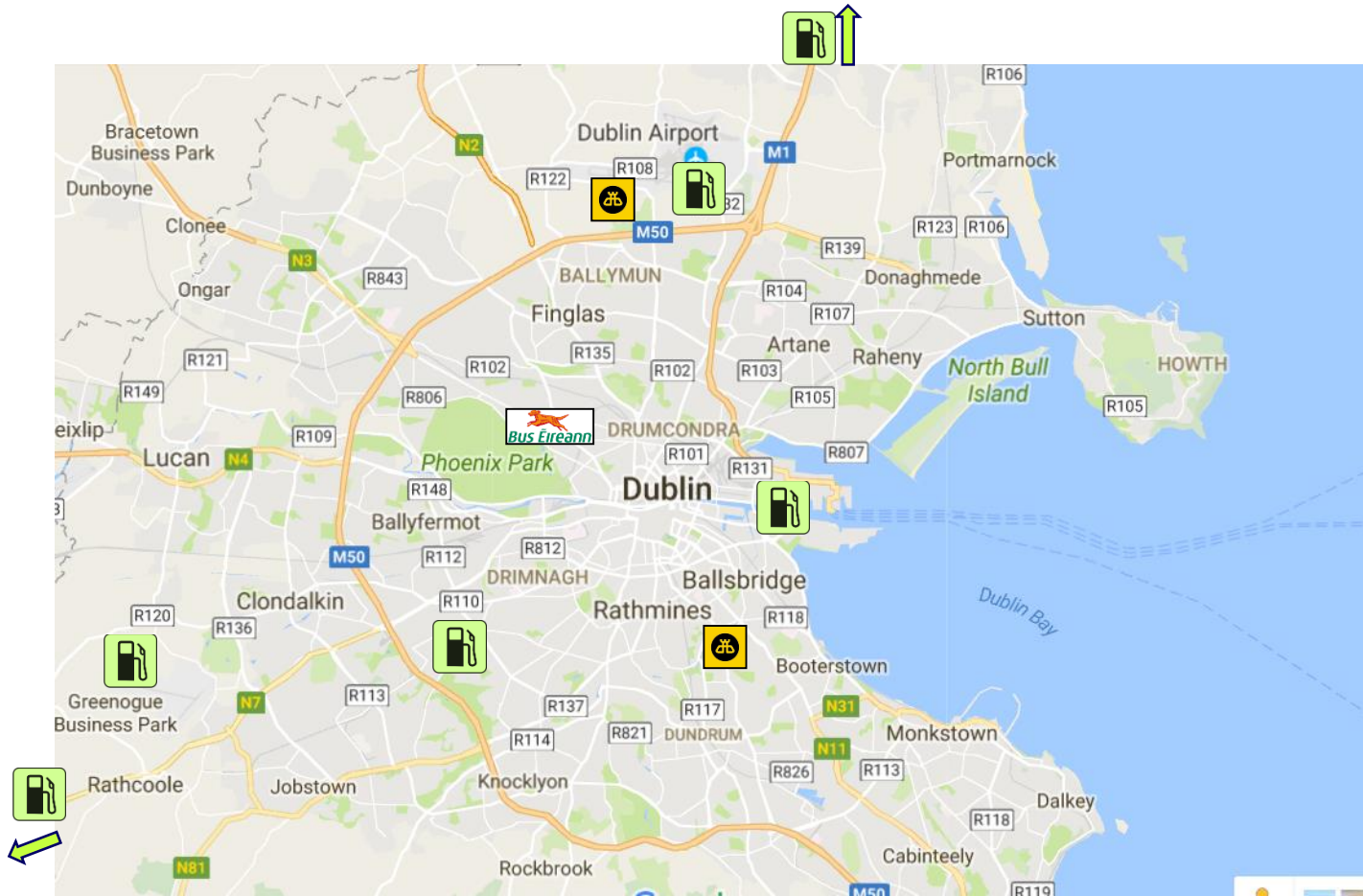
By end of 2020	By end of 2025
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CNG in urban/suburban and other densely populated areas	CNG along the TEN-T core network
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Appropriate number of points	Appropriate number of points
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- Aims to promote the use of alternative fuels in transport
- Places binding objectives on Member States to develop necessary infrastructure including publication of a National Policy Framework
- Renewable Energy Directive 2009/28/EC
  - 10% renewable energy share in final transport energy demand by 2020
- White Paper 2015 supports alternative fuel vehicles including natural gas

# Implementing Alternative Fuels Directive - Causeway Project 14 High Capacity Fast Fill Stations & Renewable Gas Injection



# Reducing Transport Emissions

- Compressed Natural Gas in transport is a well proven technology with over 25m vehicles on the road worldwide
- Gas Networks Ireland working on network of 70 CNG stations across Ireland
  - 14 stations by 2020 under Causeway
  - Further EU funding secured for next phase
- Phased transition from natural gas to renewable gas
- Initial CO<sub>2</sub> reduction of 84% on biomethane when compared with diesel vehicles
- Cost savings of up to 35% on lifecycle basis
- Additional benefits include 99% less Particulate Matter (a major contributor to air quality and respiratory illness)



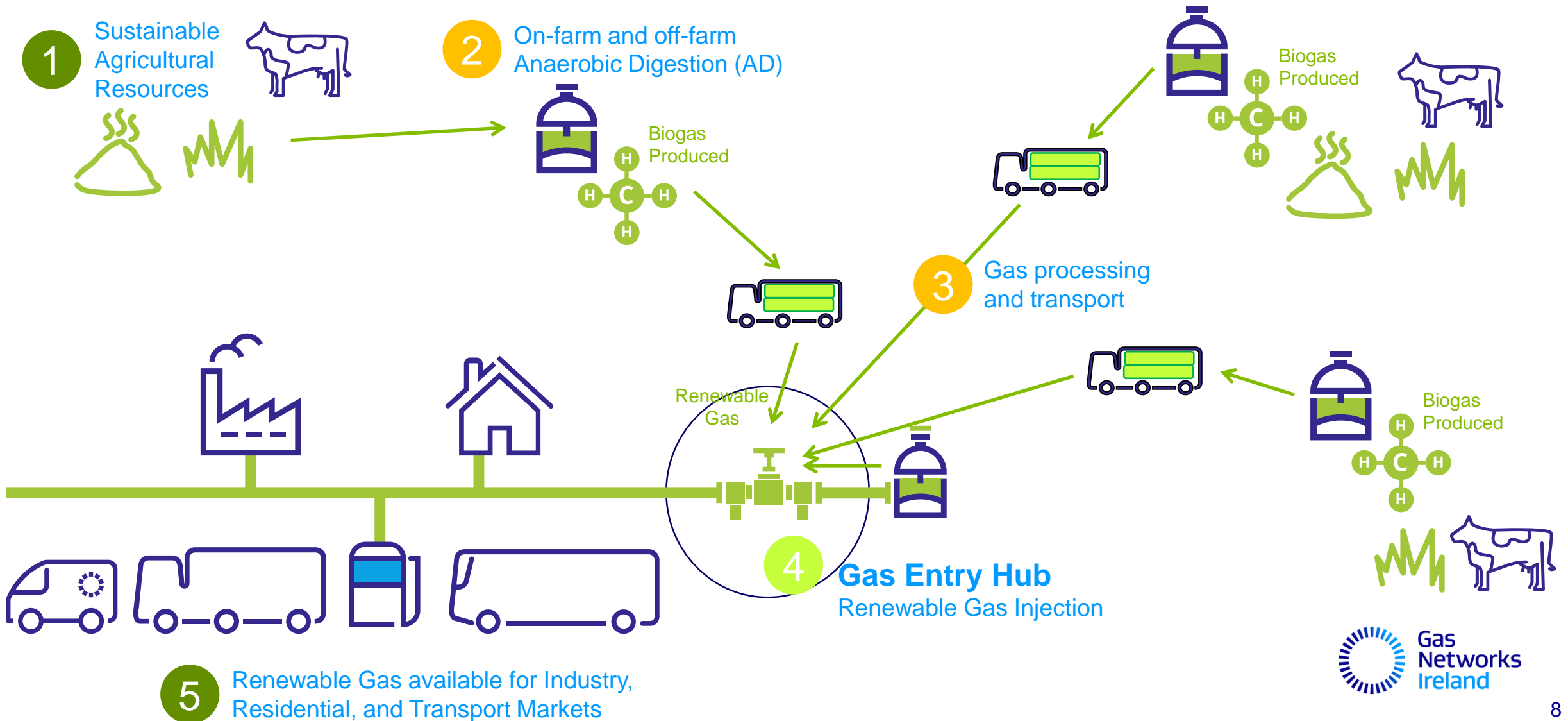
# Progress to date



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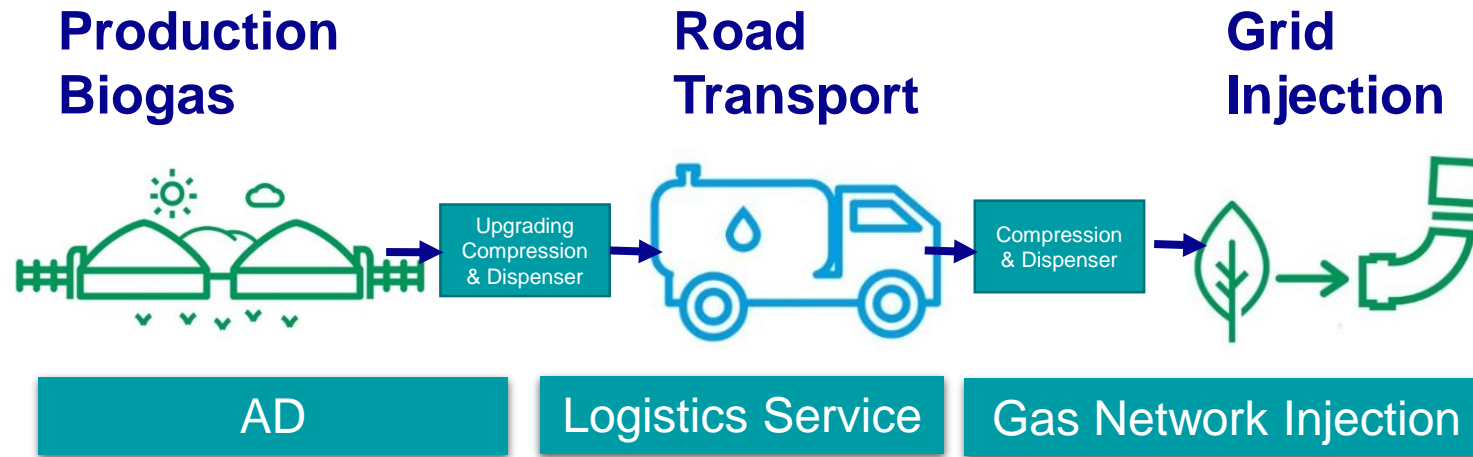
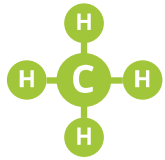
# Biomethane for transport

# Gas Entry Hub – supporting catchments of Farm AD's





# Logistics & Central Injection Points



- Biomethane will be either **directly injected** into the Gas Grid or safely transported by specialist gas tankers by an experienced logistics firm to a **central injection point**
- First Injection Point on line Q4 2018 Cush Co Kildare



# Existing Technology: First Renewable Gas Injection Project

- This anaerobic digester facility in Nurney, Co. Kildare was designed, built and commissioned within 12 months and has been operational since May 2015.
- The first Gas Grid injection facility is scheduled to commence in Q1 2019.
- The output of the project has the capability of producing 90GWh/annum of renewable gas.
  - Enough gas to power 225 buses running on 100% Biomethane



Existing biogas production facility “Green Generation” Nurney, Co. Kildare

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# Biomethane in transport

# Biomethane in Public Transport

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- Biomethane in Public transport
  - Decarbonise transport
  - Improve urban air quality
  - Reduce costs for public bus operators
- GNI actively engaged with DTTaS , NTA and bus operators
  - Bus Eireann - Irelands Greenest Bus fleet Initiative (IGBF) in Cork
    - Phase 1 Lower harbour Bus Route 22 buses
    - Phase 2 convert bus fleet in Cork c. 130 buses
  - Dublin Bus - BusConnects project
    - convert the Dublin Bus fleet of 1000 buses to Low Emission Vehicles by 2030
    - CNG/biogas is the technology of choice in GB
    - GNI have provided all information to DTTaS including results of a detailed Cost Benefit Analysis for conversion from diesel to CNG/biogas
  - Private Bus operators
    - Opportunity to convert a further c. 1000 buses from diesel to CNG /Biogas

# BusConnects

## Converting 1000 buses in Dublin by 2030



1000 buses on  
Renewable Gas



1000 buses on  
Renewable Gas



580 GWh waste to Anaerobic  
Digestion facilities

will make **public  
transport in Dublin  
zero carbon**

will remove  
**95-99% of all  
particulate matter  
(PM\*) emissions**

will produce the  
Renewable Gas  
required for **1000  
buses in Dublin**



# The Power of Stakeholder Networks - Ireland Greenest Bus Fleet

<http://www.energycork.ie/index.php/portfolio/irelands-greenest-bus-fleet/>



Cork  
County Council  
Comhairle Contae Chorcaí



Cork  
CHAMBER  
IN BUSINESS FOR BUSINESS

UCC  
University College Cork, Ireland  
Coláiste na hOllscoile Corcaigh



Gas  
Networks  
Ireland

ENERGY  
CORK



Bus Éireann

# Ireland Greenest Bus Fleet - The Stakeholders

- Bus Éireann
- Gas Networks Ireland
- Energy Cork
- Cork Chamber
- ERI/UCC
- Cork City Council
- Cork County Council



# Ireland's Greenest Bus Fleet (IGBF)

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- Transport sector one of the most difficult to decarbonise
  - Liquid hydrocarbons are an ideal transport fuel
- IGBF envisions a low-carbon future for Cork City's Bus Fleet
  - c.130 vehicles transitioned to Green Bus technology
- DTTaS running Trial of alternative bus technology options Q4 2108 - Q1 2019
  - EVs/Hybrids/biomethane all options
- Bio-methane /CNG buses are a well tried and tested technology
  - Including in Ireland
  - Successful trial in Cork 2012 proved the concept
- Buses using renewable bio-methane
  - The technology which can deliver zero carbon transport
  - EV's directly dependent on CO2 intensity of electricity generation system
    - 25% Renewables
    - 25% Coal
    - 50% Natural gas



# EU adoption of CNG/Biogas for Public Transport

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- Widespread adoption of CNG/Biogas buses happening throughout EU
  - including double decker buses in GB
- CNG /Biogas is the technology of choice for public sector buses
  - The list below is by no means an all-inclusive list , but is a sample to demonstrate the widespread adoption of CNG/biogas bus technology and the geographical spread of this.

- Reading

<http://www.gasvehiclehub.org/case-studies/10-case-studies/80-cng-buses-in-reading>

- Nottingham

<https://www.nctx.co.uk/about-us/gasbus/>

- Sunderland

[http://www.route-ne.net/articles/Scania\\_s\\_biogas\\_decker\\_comes\\_to\\_Sunderland\\_in\\_six\\_week\\_trial](http://www.route-ne.net/articles/Scania_s_biogas_decker_comes_to_Sunderland_in_six_week_trial)

- Bristol

<https://www.bristol247.com/lifestyle/environment/bristol-launches-bio-gas-bus/>

- Nantes, France

<http://www.ngvglobal.com/blog/nantes-metropole-and-semitan-order-80-iveco-cng-buses-0723>

- Madrid, Spain

<http://www.ngvjournal.com/spain-60-man-lions-city-cng-buses-for-madrid-and-barcelona/>

# Biomethane in Transport - Summary

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- Real opportunity to transform transport in Ireland
- Provide sustainable transport using biomethane /renewable gas
- Health and Environmental benefits
  - Reduce NOx, SO2, PM and other harmful emissions
  - Reduce GHG emissions
- Reduce Costs and Increase competitiveness
  - Lower costs and indigenous fuel
- Proven technology – 25 million NGVs worldwide
  - Over 11% growth per annum in Europe

