



Biomethane Industry Briefing

4 October 2023

The briefing will start promptly at 10.03 am.



Agenda

- 10:00** **UR Welcome**
Roisin McLaughlin – Utility Regulator
- 10:05** **Project Overview**
Veronika Gallagher – Utility Regulator
- 10:15** **Energy Strategy and Biomethane Call for Evidence**
Richard Hume – Department for the Economy
- 10:25** **Biomethane Connection Update**
Richard Watters – Evolve
- 10:35** **Network Strategy and Further Developments /
Opportunities for Further Engagement and Key Contacts**
Emmet McFadden (Mutual Energy), Christopher Doherty (Phoenix Energy)
- 11:10** **Q&A, UR Close**



Project Overview

Veronika Gallagher, Regulatory Analyst, Utility Regulator



Biomethane project purpose

Initial purpose:

Achieve, with delivery partners, readiness for biomethane injection into the gas network.

Current focus:

Facilitate, with delivery partners, delivery of biomethane in line with developing energy policy and emerging interest in biomethane injection.

Delivery partners:

- Gas Distribution Network Operators
firmus energy, Phoenix Energy, Evolve
- Gas Market Operator Northern Ireland
- Gas Transmission System Operators
Mutual Energy, GNI (UK)
- Department for the Economy (DfE)
(Observer)



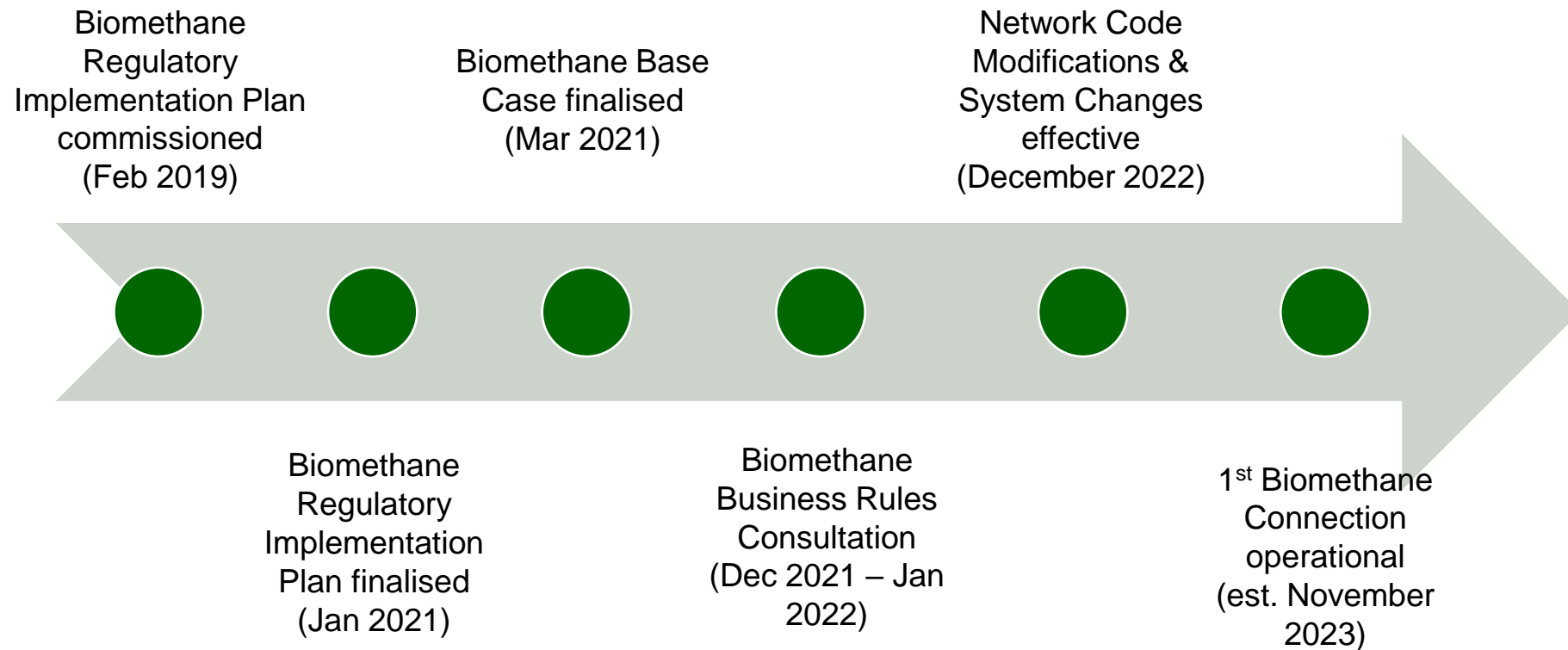
Key considerations

- Facilitation of biomethane injections at transmission and distribution level.
- Alignment with existing framework where reasonable:
→ trade off between timely implementation and functionality.
- Avoidance of unnecessary complexity of regulatory arrangements and network operations.
- Cost efficiency.
- Protection of consumer interests.
- Least regrets approach in light of ongoing development of energy strategy/policy.
- Support mechanisms to incentivise biomethane injection subject to DfE policy.
- Facilitating hydrogen injection is a longer term issue.



Key milestones

Readiness for biomethane injection (Distribution, Single Injection Sites)



Technical and operational readiness



Way forward

Facilitate delivery of biomethane in line with developing energy policy and emerging interest in biomethane injection

- Enhancement of transparency and robustness of existing arrangements.
- Facilitation of biomethane injections at transmission level, subject to demand.
- Facilitation of biomethane injection at distribution hubs, subject to demand.
- Consideration of challenges and lessons learned from producer engagement (e.g. network constraints).
- Consideration of Energy Policy implications.

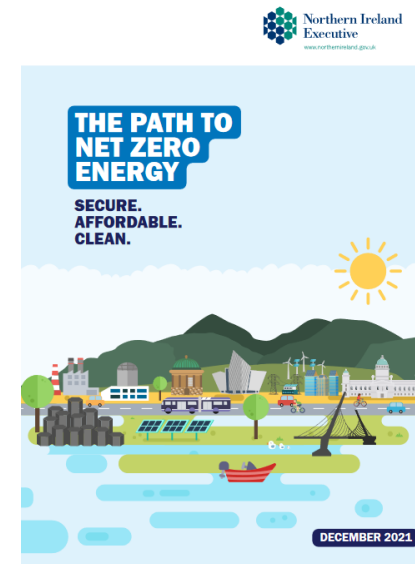
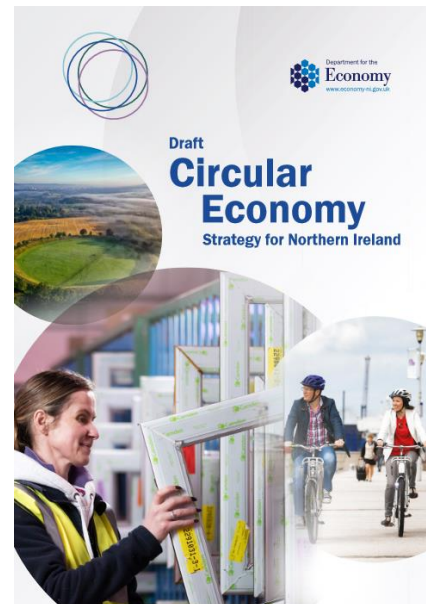


Energy Strategy and Biomethane Call for Evidence

**Richard Hume, Business & Industrial Team Manager,
Department for the Economy**

Northern Ireland Policy Environment

- 10x Economy – Innovation, Inclusive Growth and Sustainability
- Circular Economy Strategy- Innovative, Inclusive and Competitive Economy
- Energy Strategy – The Path to Net Zero



Biomethane - Call for Evidence

- Reflect the three elements of Action 9 set out in 2023 Action Plan:
 - Economics of biomethane production
 - Connection cost treatment
 - Feedstock policy (DAERA)
- Target release date of Q4 2023 with 3 months consultation period
- Potentially other Calls for Evidence/Consultations to be published around end of 2023

	Action	Detail	Owner
9	Issue a call for evidence on the options for supporting biomethane production in Northern Ireland.	<p>This will seek to establish the costs for producing biomethane and present potential options to develop the industry in Northern Ireland. We will collaborate with DAERA to optimise feedstocks for biomethane production.</p> <p>We will work with UR to monitor developer interest in injection of biomethane into the gas network and to assess the treatment of network costs.</p>	DfE (with DAERA & UR)



Economics of Biomethane Production

- Commissioned research from Centre for Advanced Sustainable Energy (CASE)
- Complemented with own analysis and engagement with biomethane developers
- Focus on large-scale production; 100,000 ton plants
- Focus on costs associated with production of biomethane from 4 main feedstocks:
Municipal waste, chicken litter, slurry and grass silage.
- Assessed economic viability:
 - What is the production cost for each feedstock?
 - What are the revenue streams to support a sustainable business model?
 - What is an acceptable buying/selling price for biomethane?
 - What is the impact to consumers' gas bill?

Connection Costs and Feedstock Policy

Connection Costs

- Assesses costs associated with connecting to the gas network.
- Considers potential options for socialising some costs.
- Engagement with gas GNOs.

Treatment of feedstocks

- Collaboration with DAERA colleagues on treatment of feedstocks and DAERA policy regarding biomethane.
- Small Business Research Initiative (SBRI) – supporting innovation, inclusive growth and sustainability

Call for Evidence – Next Steps

- Publish Biomethane Call for Evidence in Q4 2023
- Release summary of CASE Research alongside the Call for Evidence
- Keen to hear from the wider industry and welcome responses from all interested parties.
- Particularly keen to hear views on the costs associated with biomethane production in Northern Ireland.



Biomethane Connection Update

Richard Watters, Sustainability Manager, Evolve

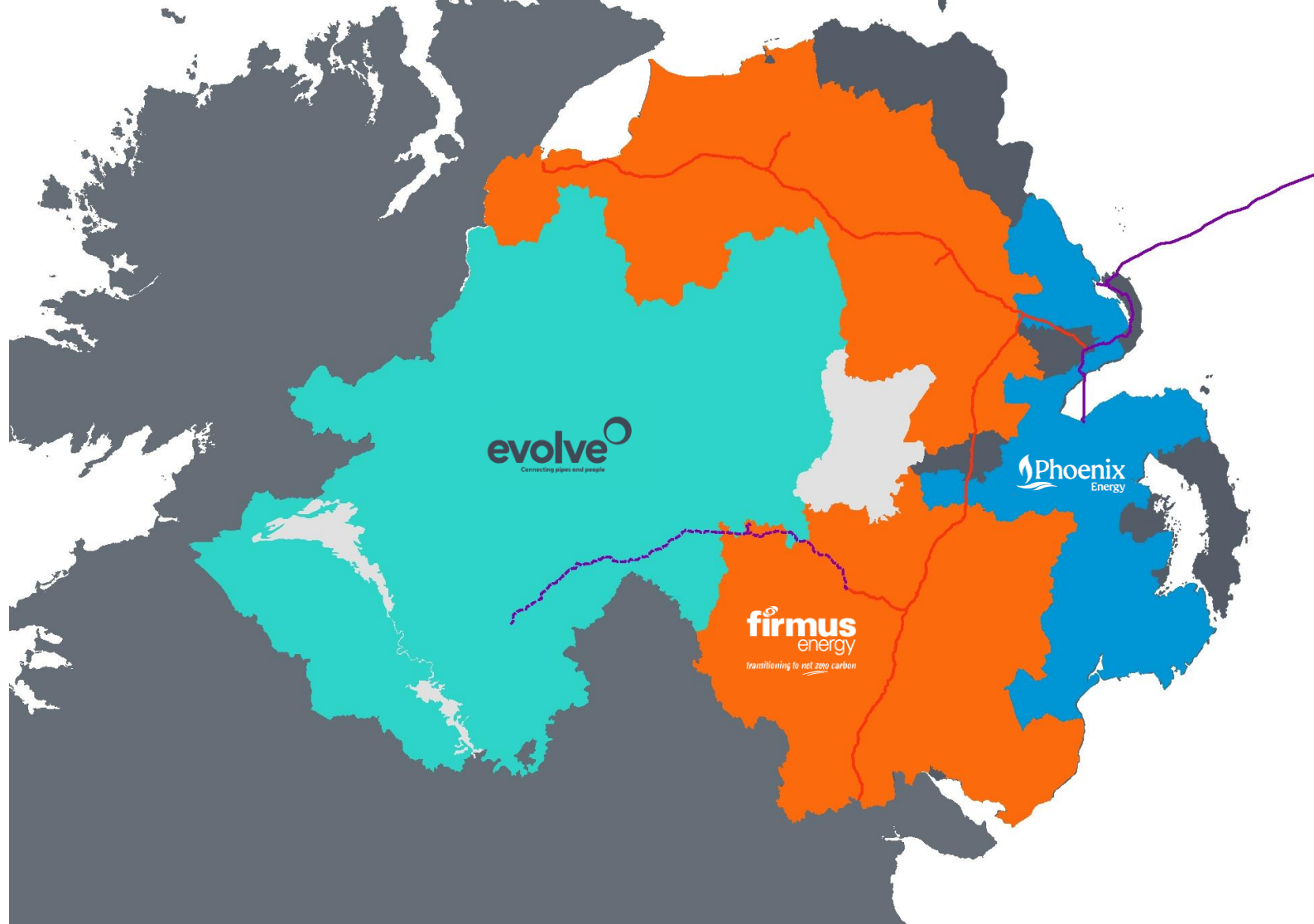


Connection Update

Richard Watters

Evolve

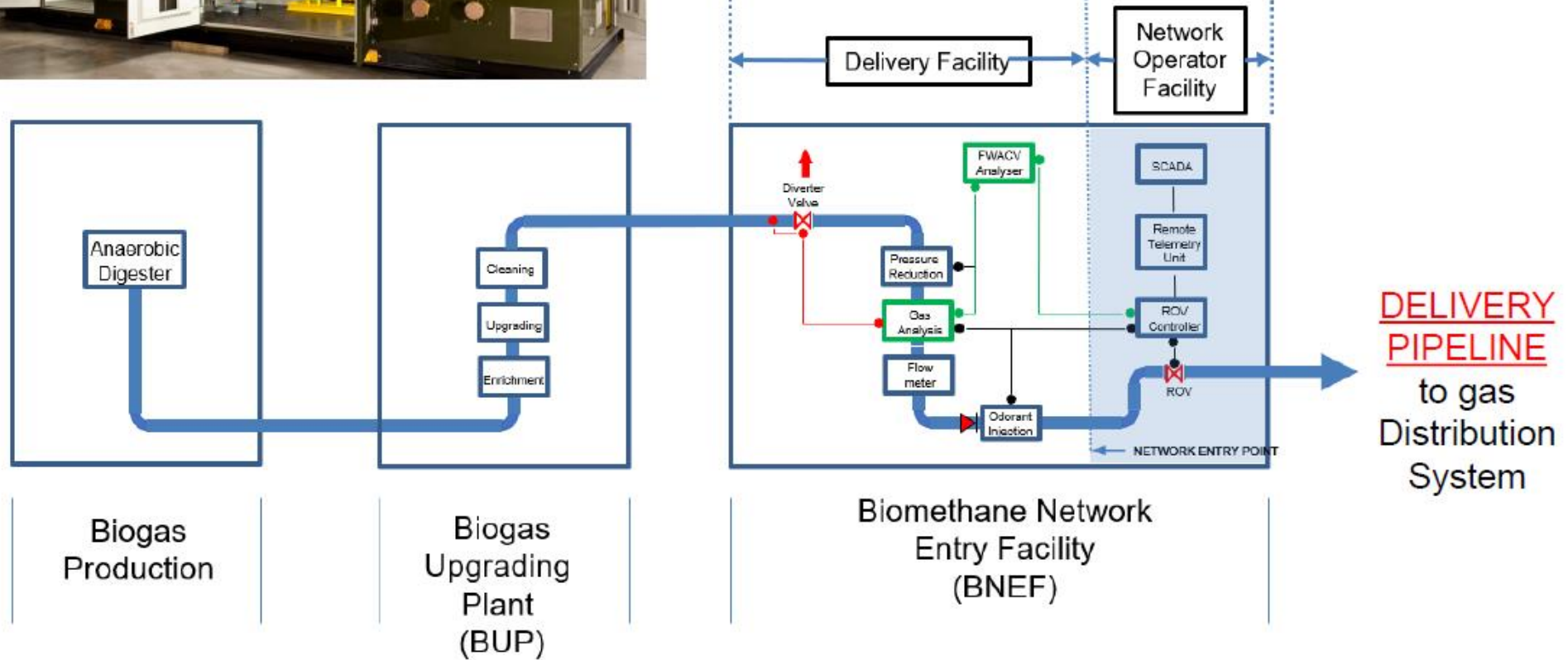
NI Transmission and Distribution Networks



Following GB - Minimum Connection Model



Built to Spec provided by DNO
(Bio2 – Functional Design Spec)



Granville Ecopark Biomethane Connection

Factory Acceptance Test completed August 2023



Granville Ecopark Biomethane Connection Update

- NEF delivered to site.
- Final connections being made prior to testing and commissioning.
- Biomethane injection to grid programmed November 2023





Network Strategy and Further Developments / Opportunities for Further Engagement and Key Contacts

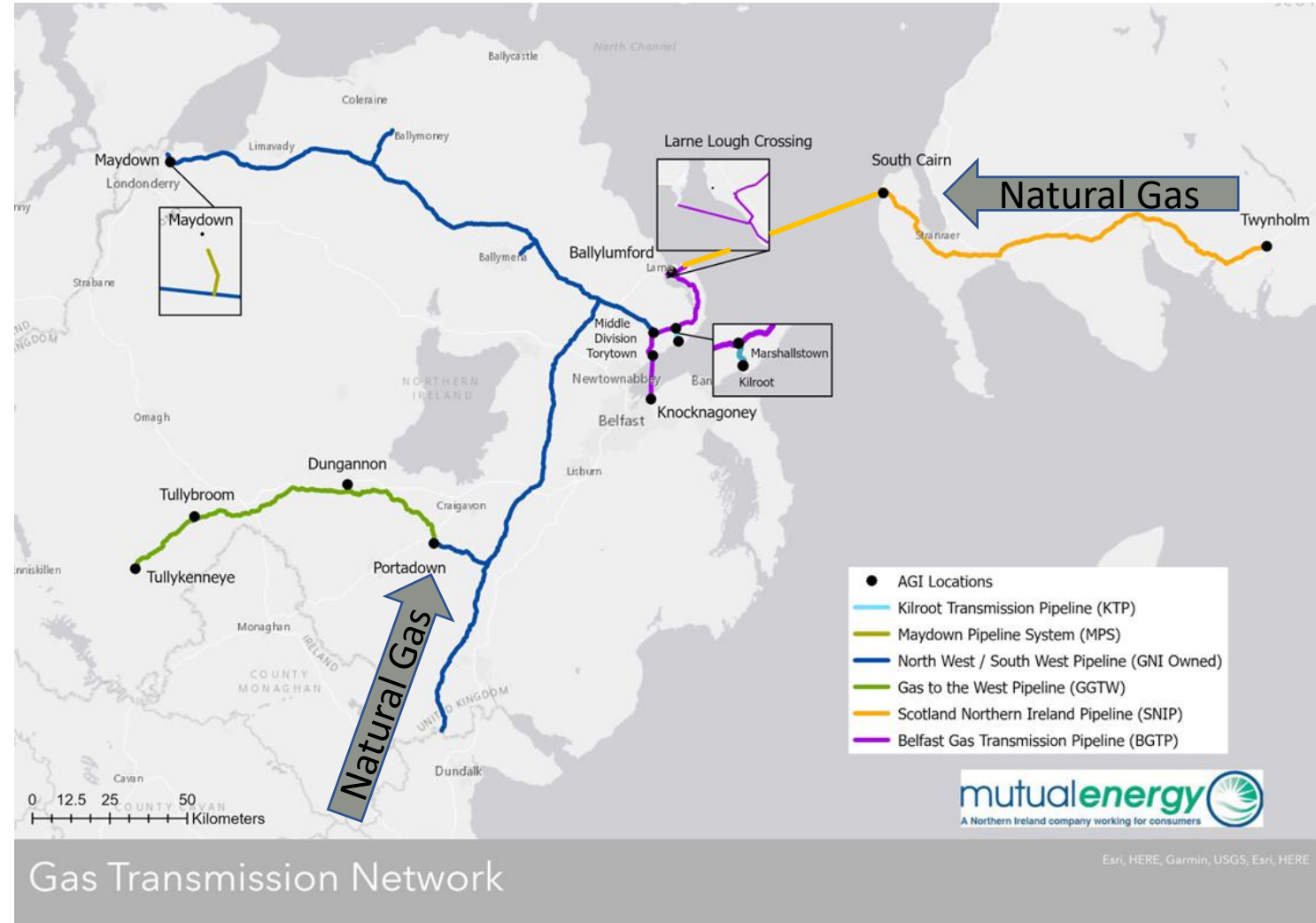
Emmet McFadden, Renewable Energy Manager, Mutual Energy

Christopher Doherty, Transportation Services Manager, Phoenix Energy

Network Planning and Strategy Development

Objective

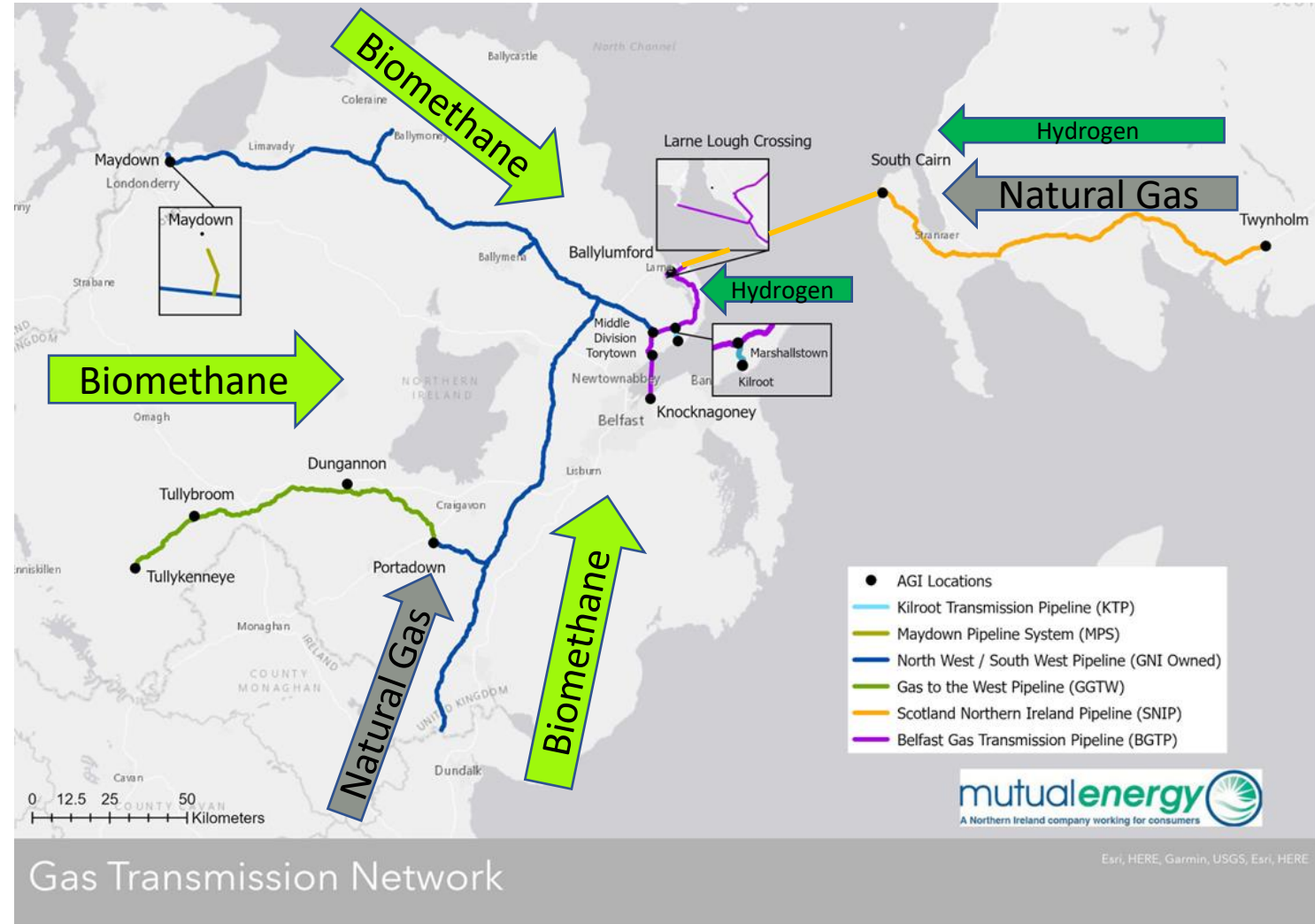
- Over a long-term “**Energy Horizon**” to 2050
 - Assess gas supply adequacy to meet demand
 - Provide a high-level view on infrastructure adequacy to meet demand and identify short term constraints
- Currently all Demand met via GB Supply



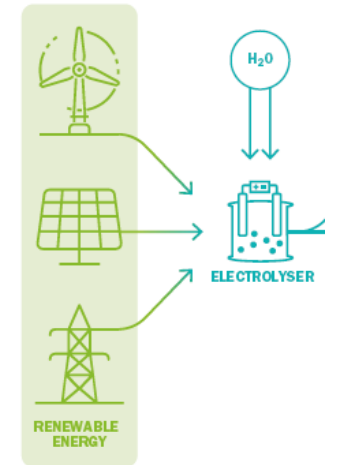
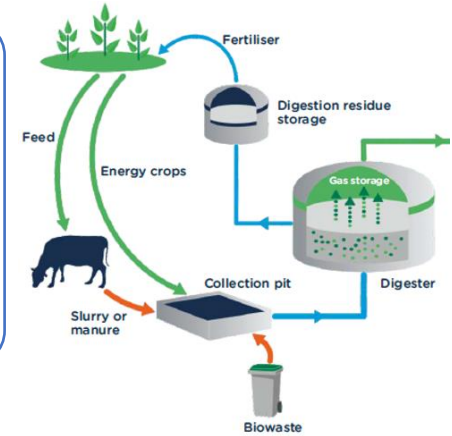
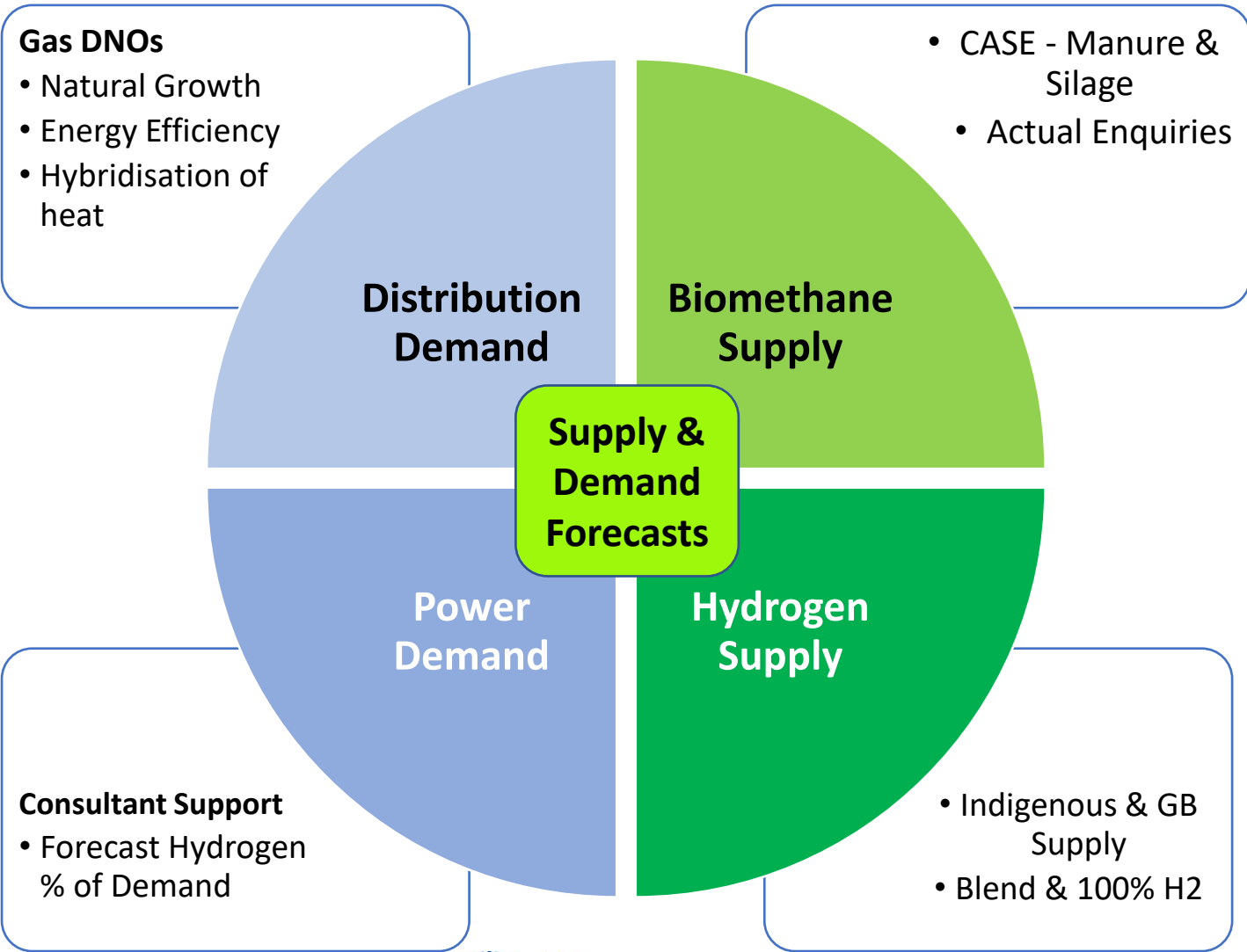
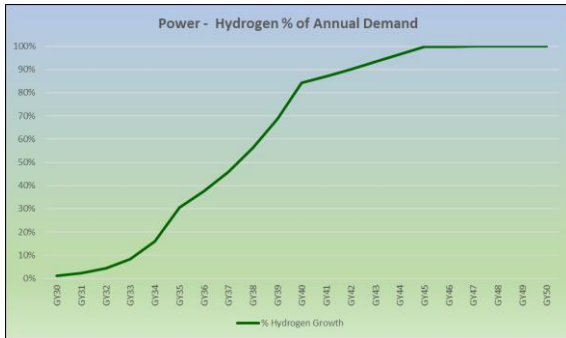
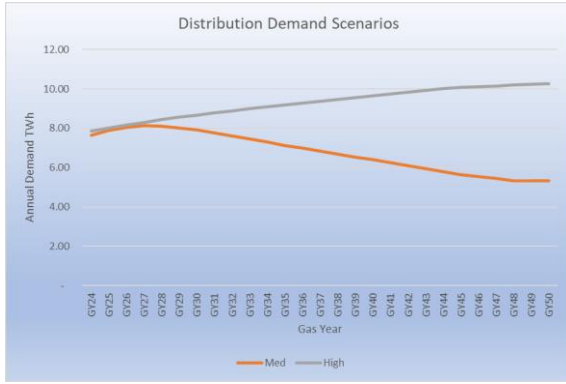
Network Planning and Strategy Development

Objective

- Over a long-term “**Energy Horizon**” to 2050
 - Assess gas supply adequacy to meet demand
 - Provide a high-level view on infrastructure adequacy to meet demand and identify short term constraints
- Currently all Demand met via GB Supply
- In the future Renewable Supply (**Biomethane** & **Hydrogen**) will back out the Natural Gas



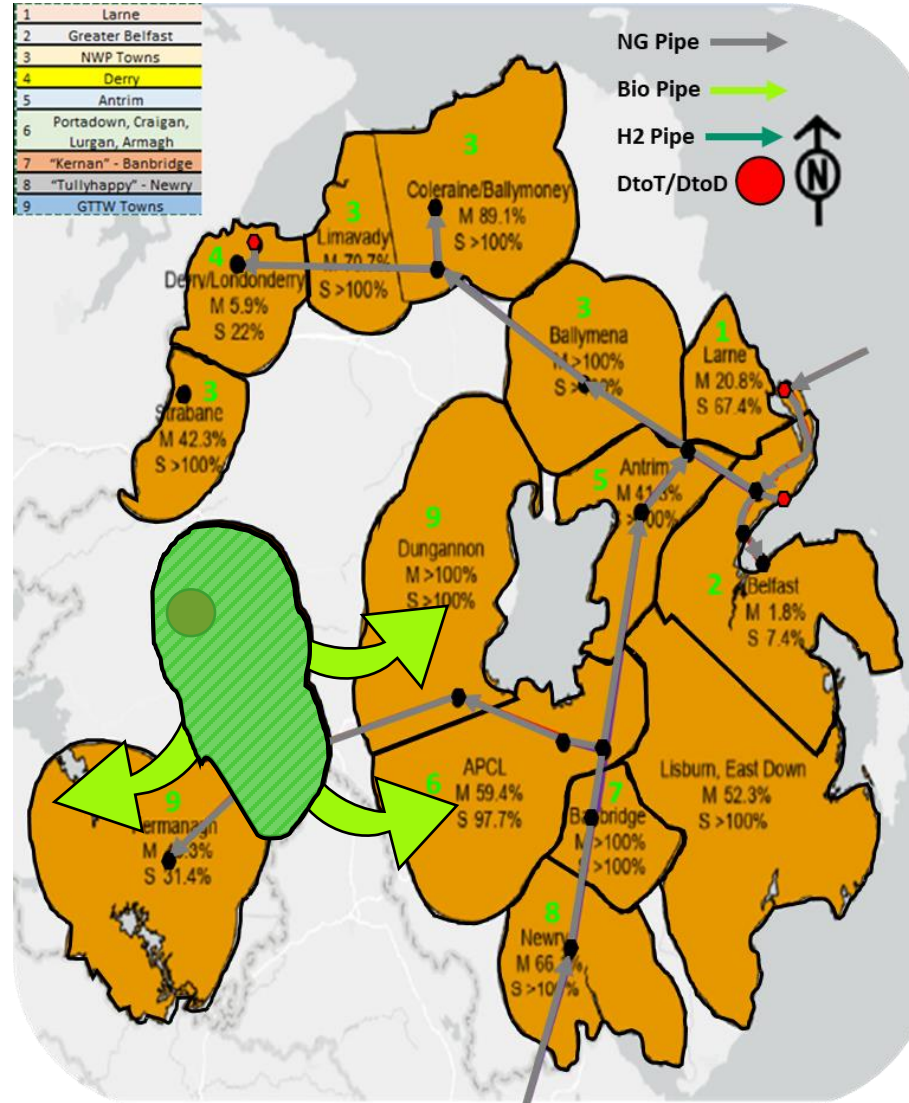
Network Planning and Strategy Development



Network Planning and Strategy Development

Network Model

- Energy Balance Model
 - Annual & Daily
- Supply merit order
 - Biomethane
 - Hydrogen (Direct / Blend)
 - Natural Gas
- Network Saturation Identified
 - Daily & Annual
- Storage Needs
- Decarbonisation Profile



Next Steps

- Initial Finding Stakeholder Engagement
 - Ureg, DfE & HSE(NI)
 - Industry – Power, Developers
- Model Development
 - Data Validation
 - Infrastructure Assessment - Snapshot Transient Analysis as required
 - Policy & CAP adjustment
- Near Term Workstream Progression



transitioning to *net zero* carbon






Further Developments / Opportunities for Further Engagement and Key Contacts

Christopher Doherty
Phoenix Energy

biomethane@phoenixenergyni.com

There is already strong local interest in producing Biomethane

Lead DNO	Location	Injection potential (m ³ /hr)
 transitioning to net zero carbon	Banbridge	200
	Ballymena	3500
	Craigavon	600
	Craigavon	250
	L'Derry	400
	Coleraine	1600
	Antrim	400
	Donegal	500
		Newtownards
West Belfast		2000
Newtownabbey		700
Lisburn		200
Larne		400
Dundonald		2500
Dundrod		1000
Belfast Harbour		1350
 Connecting pipes and people		Dungannon
	Cookstown	650
	Cookstown	400
	Coalisland	400
	Fivemiletown	3000
	Magherafelt	300
	Strabane	1250
	Omagh	300
	Total	23,500

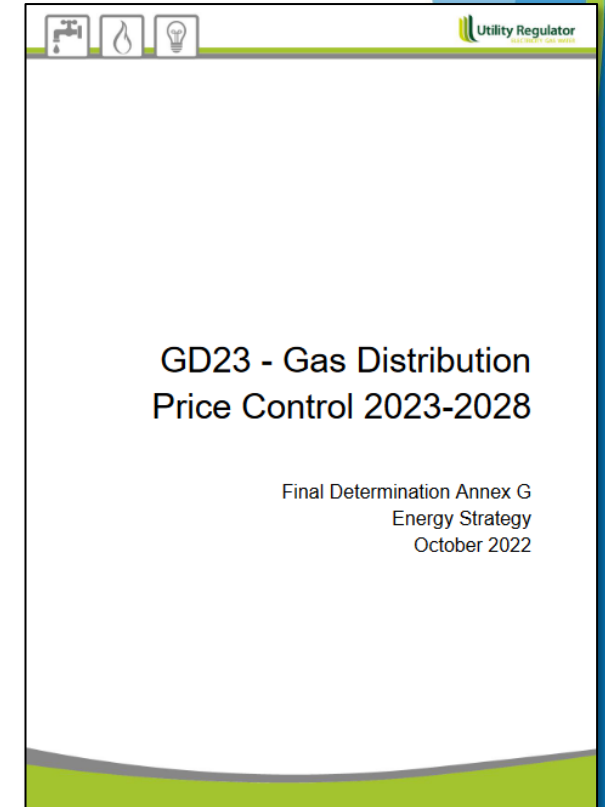
Current interest equates to 24 plants with a combined output of c.23,500 m³/hr or 2,280 GWh

- This could be low, as NI GNOs have not yet carried out a formal Request for Information in the same manner as Gas Networks Ireland has conducted in Ireland
- Balanced against this is the knowledge that there will be constraints on new AD capacity – planning, digestate management, feedstock supply, route to market etc – and AD plant output can be variable in practice

Emission Reduction Type	2 TWh Scenario
Natural Gas displacement	404,540
Farm-based emissions displacement	77,300
Carbon capture	208,241
Total	690,081 t/CO₂e

Further Developments – GD23 Energy Strategy Funding

- The Gas Network Operators (GNOs) are actively preparing for the imminent introduction of renewable gases, such as biomethane, to the NI gas network and transitioning to a net zero carbon gas network over the longer-term
- The GD23 Price Control for the Distribution Network Operators (DNOs) has established a fund to support advancing Energy Strategy requirements
 - DNOs have submitted preliminary proposals to the Utility Regulator (UR) for projects to be supported by funding which are designed to ensure network readiness in line with other jurisdictions such as GB and RoI
 - DNOs working with UR to finalise the funding application process
 - Transmission System Operators (TSOs) also in discussions with UR regarding Energy Strategy funding



Further Developments – GD23 Energy Strategy Funding

1. Essential network readiness (Biomethane)

- Projects designed to overcome market and network barriers which are limiting the production and injection of sustainable biomethane

2. Essential network readiness (Hydrogen blend)

- Urgent research/demonstration projects which are required to allow a hydrogen blend to be safely and fairly injected into the network within a very constrained time period

3. Future Network Strategy

- Research/demonstration/engagement projects designed to develop the evidence required to inform the establishment of an optimal, affordable, medium and long-term network strategy for decarbonisation

4. Immediate decarbonisation opportunities

- Projects designed to inform consumers about the decarbonisation of heat and accelerate the switching of oil consumers to gas to support 2030 emission reduction targets

5. Saving through Innovation

- Innovation projects designed to facilitate a reduction of the medium and long-term cost (wholesale & network) of the energy transition for NI gas consumers should other funding streams not be available

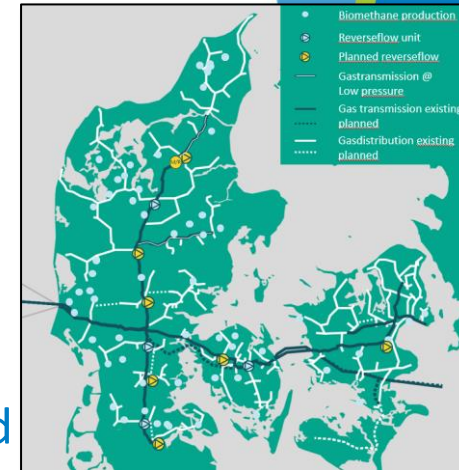
Further Developments – GD23 Energy Strategy Funding

Next Steps



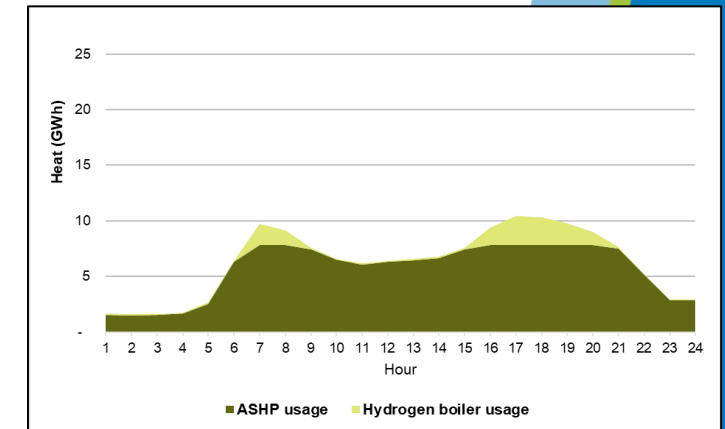
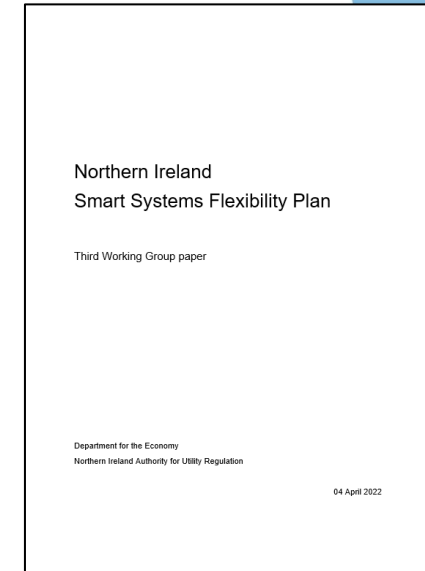
Network Constraint Research

- Larger AD plants in NI could be constrained by a lack of capacity in rural distribution networks with lower-demand
 - This is not an NI-only issue
 - GNOs learning from best practice in other jurisdictions
- The GNOs intend to conduct a consultant-led, NI-wide, review of the potential mitigation options, to compare costs, and to identify regulatory hurdles to progression. Options include:
 - D>T and D>D reverse compression – commonplace in areas of high biomethane investment such as Denmark and France, and is being progressed in GB
 - Virtual injection hubs
 - Connecting distribution network zones
- Separate regulatory discussions are ongoing on addressing capacity constraints identified to date
- ***Desired Outcome:*** *Comprehensive report which identifies potential cost-effective options to inform network strategy development and policy decision-making and identifies key regulatory/engineering workstreams to be progressed*



Network Strategy – Network Strategy for 2050

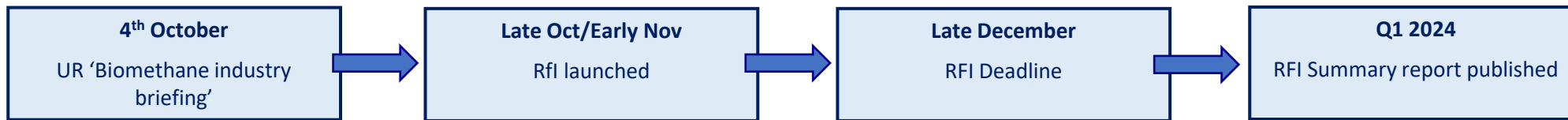
- The Network Strategy work will also inform other plans such as the NI Gas Network's role in the future
- The GNOs anticipate that NI Gas Network will form a critical part of an integrated energy system going forward which maximises utilisation of existing gas infrastructure assets
 - Potentially reducing the total investment in new infrastructure required to achieve net-zero
- GNOs will undertake an in-depth review of how the NI Gas Network can support a wider, flexible, smart, decarbonised NI energy system. For example:
 - Supporting the transition of power generation
 - Utilisation of Hybrid Heat Pumps to improve affordability of Electricity Network and Generation investment
- **Desired Outcome:** A series of reports exploring the decarbonisation and economic benefits of various whole system options



NGESO FES 2022: Hourly dispatch profile for hybrid

Network Strategy – Request for Information

- To assist with the development of the Network Constraints & Future Network Strategy studies, the NI GNOs intend to publish a Request for Information for biomethane producers
- The GNOs will invite biomethane producers to respond to this Request for Information to:
 - help us to plan for a gas network fit to deliver on NI's biomethane potential in the most efficient and effective manner; and
 - affordably and efficiently remove constraints on biomethane injection into the network.



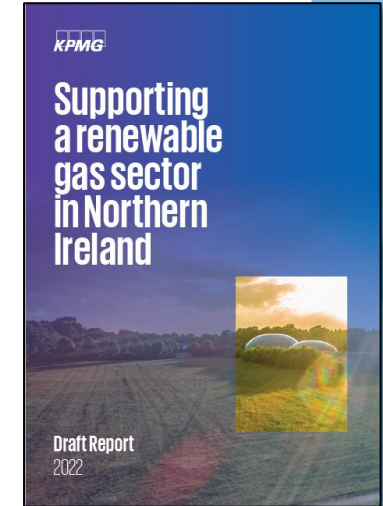
Policy Development

- The GNOs have been actively working to influence policy to capitalise on the significant scope for biomethane production in NI to:
 - support an indigenous biomethane industry;
 - offer a decarbonisation solution to gas-network-connected large energy users
 - unlock significant economic and environmental sustainability opportunities for the rural economy
- We have supported, and continue to support several academic-led research projects to inform development of our future network strategy:
 - Evaluating the opportunity for utilising anaerobic digestion and pyrolysis of livestock manure and grass silage to decarbonise gas infrastructure: A Northern Ireland case study [*CASE, QUB, AgriAD, AFBI, Phoenix*]
 - E-Methane; Utilization of Green Hydrogen and Biogenic CO₂ for E-Methane Production in Northern Ireland [*CASE, QUB, Renewables United, Phoenix, firmus, US National Renewable Energy Laboratory*]
 - Designing a Proof-of-Concept Pilot Study to Examine the Role of Agricultural Manure Management in Energy Production and Decarbonisation [*CASE, AFBI, Renewables United, Colloide Engineering, Phoenix, firmus*]



Policy Development

- The DNOs, in conjunction with Action Renewables, have also invested in several research projects to support our engagement with the biomethane sector and inform our response to Executive policy:
 - A KPMG authored report examining the viability of potential NI biomethane support schemes (published October 2022)
 - A KPMG developed AD plant financial model to allow the DNOs to test the impact of potential support scheme options (being finalised)
 - A NNFCC authored digestate management study reviewing options for the sustainable management of digestate in a high nutrient surplus environment like NI (under development)
- *We are constantly seeking new research projects and partners, so if you have a potential research project which you think we could support, then please contact us!*




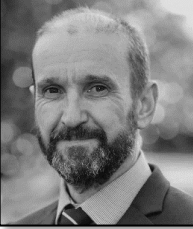








Policy Development

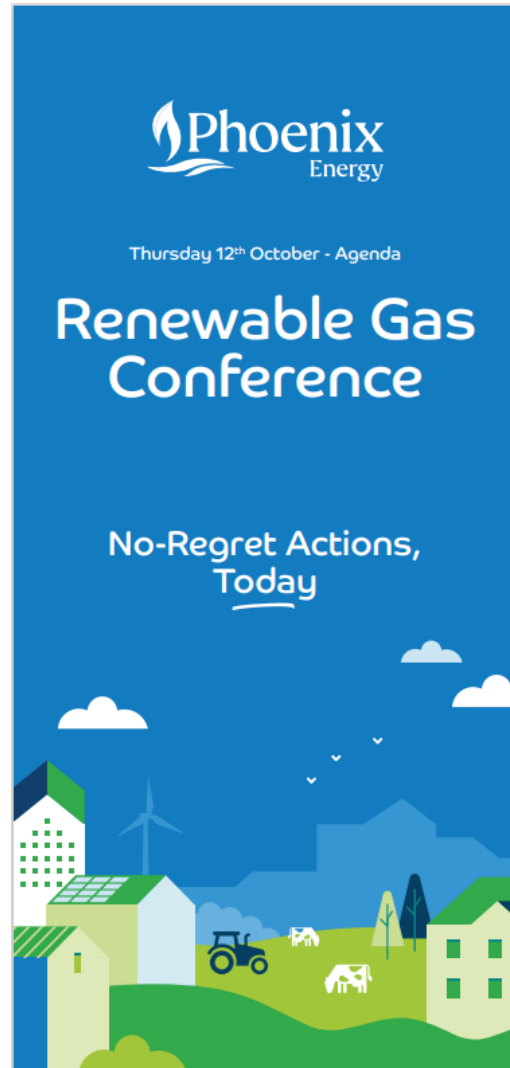
- In the current absence of an NI specific biomethane support scheme, the DNOs have established a working group to explore alternative initiatives to support the biomethane market in NI
- DNOs are especially keen to explore options that assist Large Energy Users to obtain access to biomethane
- DNOs aim to provide its initial findings in its response to the DfE Call for Evidence
- DNOs would welcome engagement with any participant to inform its thinking in this area



Opportunities for Further Engagement & Key Contacts

		<p>Iain Hoy Energy Transition Manager iain.hoy@phoenixenergyni.com</p>
 <p>transitioning to <i>net zero</i> carbon</p>		<p>Neil Gallagher Sustainability Manager ngallagher@firmusenergy.co.uk</p>
 <p>Connecting pipes and people</p>		<p>Richard Watters Sustainability Team Manager Richard.Watters@evolvenetwork.co.uk</p>
		<p>Cait Long Energy Transition Policy Lead cait.long@mutual-energy.com</p>
		<p>Shane Rafferty NI Energy Transition Manager shane.rafferty@gasnetworks.ie</p>

Phoenix Renewable Energy Conference



NI's Green Energy Ambition

Jonathan Martindale, Phoenix Energy
Ryan White, DfE
Jonathan McFerran, DAERA
John French, Utility Regulator
Oliver Lancaster, IGEM

Biomethane: A No Regret Solution Today

Prof David Rooney, Queens University, Belfast
Lars Kaspersen, Nature Energy
Lucy Hopwood, NNFCC, Bioeconomy Consultants
Kevin Harrison, NREL, U.S. National Renewable Energy Laboratory

Decarbonisation: Creating Economic Value

Debbie Caldwell, Belfast City Council
Clare Guinness, Belfast Chamber
David Smith, Kilwaughter Minerals
Dr Nick Primmer, Future Biogas



Questions and Answers