

A GUIDE TO
**BIOMETHANE CONNECTIONS
TO THE NORTHERN IRELAND
GAS NETWORK**

Transmission Connections | Version 1.0
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FOREWORD

This guide is intended to help you, as the owner or developer of a biomethane production facility, to connect your production facility to the gas transmission network in Northern Ireland.

The gas transmission network in Northern Ireland is owned by two Transmission System Operators (TSOs); GNI (UK) Limited ("GNI (UK)") and Mutual Energy Limited ("MEL").



About GNI (UK) Limited

GNI (UK) Ltd. own and operate two transmission pipelines in Northern Ireland, the South North pipeline running from Gormanston, Co. Meath to Co. Antrim and the North West pipeline running from Carrickfergus to Coolkeeragh power station.

GNI (UK) Ltd. is a subsidiary of Gas Networks Ireland, who also own and operate the transmission and distribution networks in the Republic of Ireland.



About Mutual Energy Limited

Mutual Energy own and operate the Scotland to Northern Ireland natural gas transmission pipeline (SNIP), which imports the vast majority of the gas used in Northern Ireland.

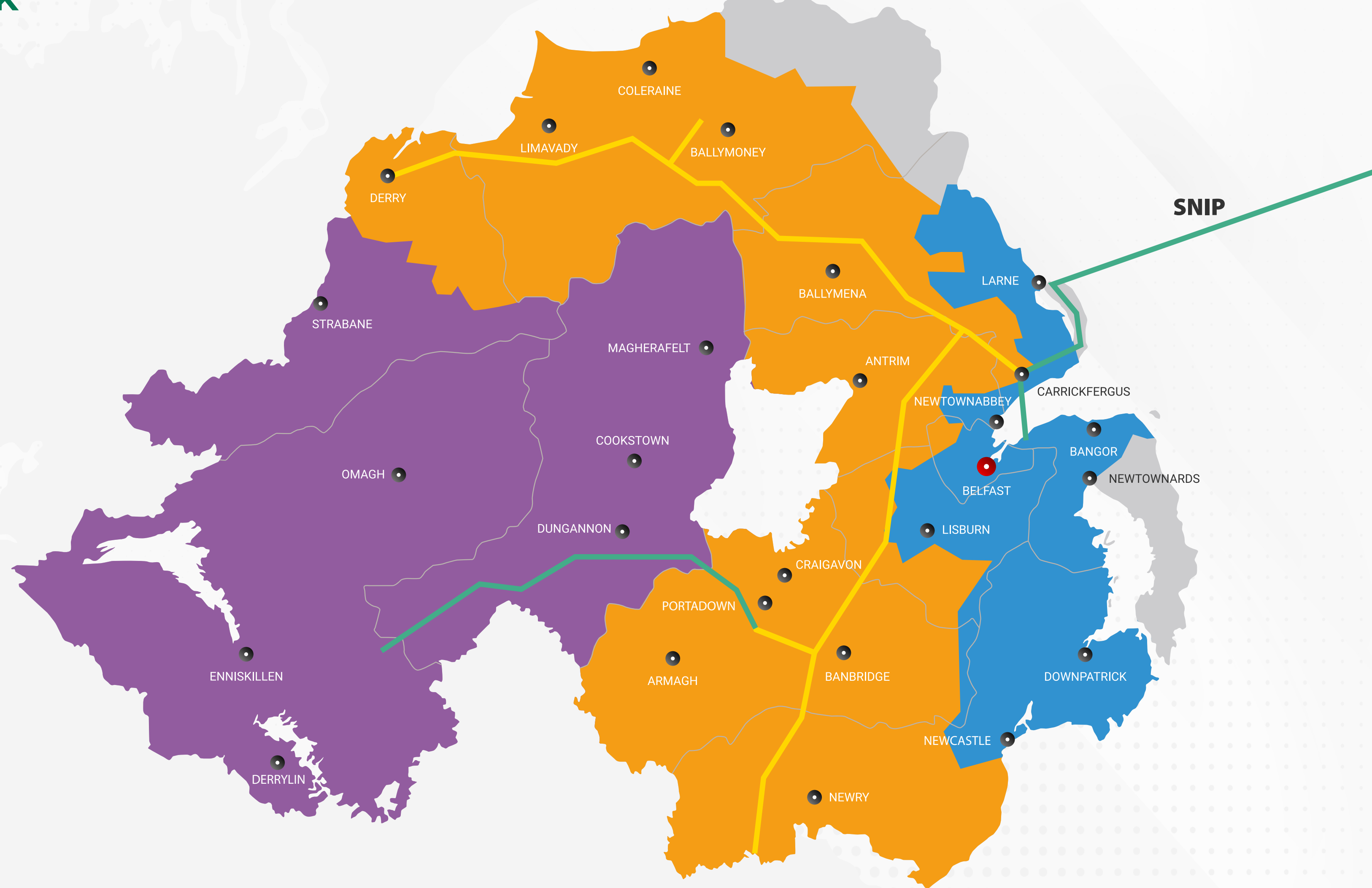
As well as the subsea pipeline, MEL own and operate large sections of the gas transmission network (the Belfast Gas Transmission Pipeline and the West Transmission Pipeline), have responsibility for co-ordinating the response to gas emergencies throughout Northern Ireland and work with GNI (UK) to provide a market operator function ensuring the efficient transportation of gas throughout Northern Ireland. This joint body is called the Gas Market Operator for Northern Ireland (GMO NI).

OVERVIEW OF THE GAS NETWORK IN NORTHERN IRELAND

Natural gas was first introduced to Northern Ireland in 1996 via the SNIP (Scotland to NI gas Pipeline) which receives gas from Great Britain through a interconnector pipeline. Natural gas can also enter Northern Ireland through the Republic of Ireland using the South North pipeline. The high-pressure transmission network is managed by MEL and GNI (UK). This provides the backbone through which gas is transported to individual lower pressure distribution networks and zones. There are three distribution network operators in Northern Ireland:

- Phoenix Natural Gas who operate in the Greater Belfast area
- Firmus energy who operate in the midlands and in the North of the country, and
- SGN Natural Gas who operate in the West.

Figure 1 shows graphically each of these distribution zones as well as the high-pressure transmission networks of GNI (UK) and MEL shown in yellow and green respectively.



MAP KEY















	
	
	
	
	

Figure 1: Schematic of the gas network in Northern Ireland

WHO IS INVOLVED IN THE GAS NETWORK OF NORTHERN IRELAND?

Table 1: Overview of Gas Market actors in Northern Ireland

ROLE	DESCRIPTION	MARKET ACTORS
Producers	Produce gas for gas shippers to deliver gas to the gas network. Shippers currently source and import gas from Great Britain but could be sourced from indigenous biomethane producers.	
Transmission Network Operators	Operate and maintain the high-pressure gas transportation system in Northern Ireland, taking gas from entry points such as the interconnectors or producers and transporting it to the various transportation system offtakes including regional distribution zones.	
Distribution Network Operators	Operate and maintain the regional distribution networks in Northern Ireland, taking gas from the transmission network and distributing it to homes and businesses around the country for shippers.	
The Gas Market Operator (GMO NI)	Operates the gas market for Northern Ireland, managing the commercial rules and all trading and transactional aspects of the gas transmission market in Northern Ireland on behalf of the Transmission System Operators in Northern Ireland.	
Shippers	Shippers are the link between producers and suppliers and use the gas network to transport gas from entry points to exit points.	Shippers are required to hold a supply licence. A list of supply licence holders can be found here; https://www.uregni.gov.uk/gas-licences#toc-2
Suppliers	Suppliers purchase gas on the wholesale market, then sell it to Northern Ireland energy consumers.	A list of supply licence holders can be found here; https://www.uregni.gov.uk/gas-licences#toc-2
Regulator	<p>The regulatory authority is responsible for approving the charges for use of the gas network in Northern Ireland.</p> <p>They issue network operator and supplier licences to the relevant market actors as well as ensuring customer interests are protected through license obligation adherence and by approving regulated policies.</p>	

DECARBONISING THE GAS NETWORK

The Department for the Economy’s (DfE) publication of the Northern Ireland Energy Strategy “The Path to Net-Zero Energy¹” in December 2021 set Northern Ireland on a clear trajectory to net zero energy by 2050. The strategy envisions a strong enabling role for the NI gas networks through supporting the injection and transportation of renewable gases, biomethane and hydrogen. On this basis, the NI Gas Network Operators developed their Pathway to Net Zero report² setting out the role the gas network can play in supporting this goal. This pathway sets out a clear vision for transitioning the network to one transporting purely renewable gases over 6 distinct stages:

1. **Preparing for the transition (2022-2025)**
2. **First Renewable Gas Connections (2023-2026)**
3. **Establishing Supply & Demand (2026-2030)**
4. **Accelerating Ambition (2030-2040)**
5. **Home Stretch (2040-2049)**
6. **A Zero Carbon Gas Network (2050)**

The Gas Network operators are currently actively engaging in Stage one and Stage two, developing the regulatory and commercial frameworks to enable biomethane injection onto the network, with the first flows of biomethane expected to inject into the distribution networks in 2023.

ABOUT BIOMETHANE

What is it? – Biomethane is a green, non-fossil source of energy, produced from biogas derived from organic waste via Anaerobic Digestion. In terms of its chemical composition, biomethane is nearly indistinguishable to the composition of the natural gas currently flowing through the NI Gas Network today. Sources of biomethane feedstock include landfill, food waste, livestock waste, crops or underutilised grassland.

Is this a new technology? – No. Biomethane is a proven alternative to natural gas which is already injected into gas networks across Europe. In Denmark, for example, 20% of total gas consumption is met by biomethane and the country aims to increase this share to 100% by 2050.

What’s the impact on consumers? – As biomethane is nearly identical to natural gas, blending it into the gas grid offers a means to reduce the carbon footprint of NI’s gas supply without asking the consumer to change anything.

What are the environmental benefits? – Biomethane has several environmental benefits, the main one being that it re-purposes methane from waste which would otherwise be released into the atmosphere. Not only does producing biomethane provide a greener gas solution for homes, businesses, transport and power generation, it also reduces farm methane emissions - a significantly more potent greenhouse gas than carbon dioxide - and helps tackle NI’s significant manure-based nutrient surplus.

How much Biomethane is available? – A collaborative research project supported by the Centre for Advanced Sustainable Energy (CASE) and Invest NI - has found that Northern Ireland has the resources to produce more biomethane from agricultural waste and underutilised grassland than previously thought possible – over 6.12 TWh per annum. This equates to of 82% of regional distribution network demand in 2021 and would require c. 150 biomethane production plants to be delivered (assuming an average 40 GWh / annum plant size). This estimation is conservative and doesn’t include potential feedstock from dedicated energy crops or domestic and non-domestic waste.

¹<https://www.economy-ni.gov.uk/publications/energy-strategy-path-net-zero-energy>

²<https://www.mutual-energy.com/wp-content/uploads/2022/10/13810.001-20pp-Pathway-to-Net-Zero-WEB.pdf>

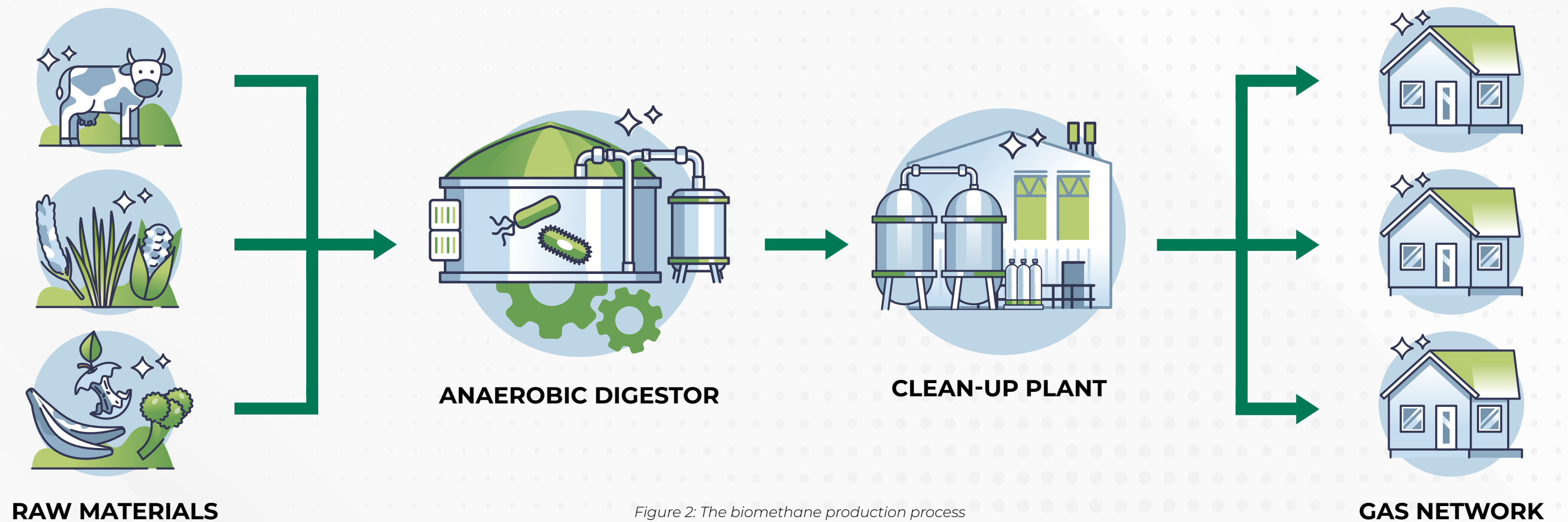


Figure 2: The biomethane production process

An aerial photograph of a city, likely Glasgow, Scotland, showing a wide river (the River Clyde) flowing through the center. The city is densely packed with buildings, including modern glass-fronted structures and older brick buildings. In the background, there are rolling hills and mountains under a sky with scattered clouds. The left side of the image is partially obscured by a green vertical panel with a white circuit-like pattern.

GETTING CONNECTED

Getting a connection to inject biomethane onto our networks require a number of steps to ensure a safe and secure connection.

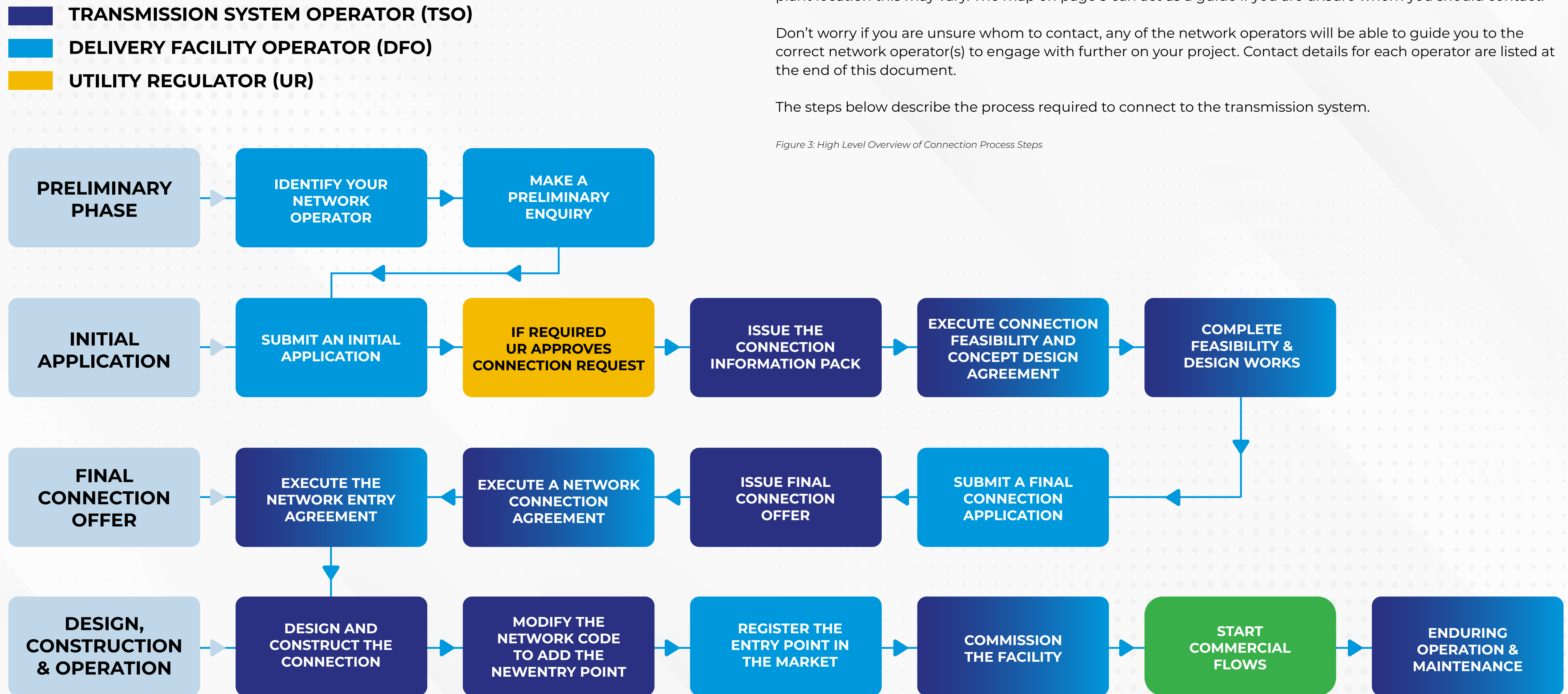
1. IDENTIFY YOUR NEAREST NETWORK OPERATOR

Your first step to getting connected is to contact your closest network operator. Depending on your proposed plant location this may vary. The map on page 3 can act as a guide if you are unsure whom you should contact.

Don't worry if you are unsure whom to contact, any of the network operators will be able to guide you to the correct network operator(s) to engage with further on your project. Contact details for each operator are listed at the end of this document.

The steps below describe the process required to connect to the transmission system.

Figure 3: High Level Overview of Connection Process Steps



2. PRELIMINARY ENQUIRY

- a)** The Preliminary Enquiry phase of the connection process is a non-binding exchange of information between the Transmission System Operator (TSO) and the Delivery Facility Operator (DFO), i.e. the biomethane project developer and producer.
- b)** Following an enquiry from the DFO, the TSO and DFO engage to understand the biomethane project requirements and to discuss the process of connection to the gas network. The DFO can submit a "Preliminary Enquiry Form" to the TSO to capture the proposed project specific information.
- c)** The TSO can use this information to develop a preliminary enquiry information pack, providing gas industry background information, an overview of the technical and commercial process of connecting to the gas network and some initial high-level project specific information, such as indicative costs and proximity to the network. An Initial Application form will also be provided at this point which the DFO should fill in and submit to the TSO to proceed to the next stage in the process.



3. INITIAL APPLICATION - CONNECTION FEASIBILITY AND CONCEPT DESIGN

- a)** Upon receipt of a valid Initial Application form from the DFO, the TSO will firstly notify the Utility Regulator (UR), as UR approval for any new connection request to the transmission network may be required.
- b)** Subject to any required approval, the TSO will review the application and issue a "Connection Information Pack" to the DFO, detailing an estimate of the total cost of connection as well as details on the cost and timelines to complete a connection feasibility and concept design, assessing the connection request in more detail.
- c)** In order to progress the application, the DFO and TSO must execute a Connection Feasibility and Concept Design Works Agreement to commence works on assessing the connection request in more detail. These works are required to be undertaken prior to the development and execution of a Network Connection Agreement.
- d)** The Connection Feasibility and Concept Design Works Agreement will allow the TSO to complete the following works:
- Carry out detailed network analysis to identify the optimal connection routing and pipeline specifications
 - Undertake a conceptual design of the connection and agree with the DFO, the optimal location for constructing the network entry facility, where biomethane will be injected
 - Assess and identify any potential connection constraints
 - Develop the Functional Design Specification guidelines for the network injection facility, which sets the requirements the DFO must design and install their equipment associated with the injection process to.
 - Produce a preliminary design of the connection and network entry facility, including requisite risk assessment of gas quality
 - Undertake a market assessment to better refine construction costs and timelines
- e)** The DFO will be liable for the costs of the Connection Feasibility and Concept Design Works Agreement.

A template agreement can be shared alongside the "Connection Information Pack" issued by the TSO.



4. FINAL CONNECTION OFFER

- a)** Following review of the Connection Feasibility and Design, the DFO confirms intent to proceed by submitting a Final Connection Application. Both TSO and DFO may meet again to finalise project requirements and should the project require any additional studies, the DFO and TSO shall agree the scope, timeline and cost estimate after which the studies shall be completed and issued to the DFO.
- b)** The TSO shall provide a Final Connection Offer which shall include and be generally subject to,
- TSO and DFO executing a Network Connection Agreement
 - TSO and DFO executing a Network Entry Agreement
 - Where required any NI Network Code modifications made and approved by the Utility Regulator
 - Both DFO and TSO achieving the necessary project consents, e.g. planning permission
- c)** The DFO will confirm their intent to proceed with the connection application by executing the various agreements and making the connection charge payment.

Agreements

- a)** The **Network Connection Agreement**: Once the project has reached a sufficient level of maturity, prior to entering the detailed design and construction phase, a Network Connection Agreement must be in place between the DFO and the TSO. This agreement details the commercial arrangements under which a connection is to be offered to the DFO. This includes details such as site location, list of equipment to be owned/ installed by both parties, where the boundary of ownership between the parties lies as well as the timelines, costs and staging of payments to be provided during the construction phase of the project.
- b)** A **Network Entry Agreement**: This agreement sets out on an enduring basis the technical and operational conditions under which the entry point onto the network will be managed. This includes details such as maximum / minimum injection quantities allowable as well as specifications on gas quality to be adhered to at the injection point. This document also sets out the obligations on both parties in terms of ongoing operation and maintenance of the facility. This agreement must be executed prior to commissioning the facility but may be required by the DFO in advance of executing the Network Connection Agreement to provide certainty.

5. DETAIL DESIGN, CONSTRUCTION, COMMISSIONING & OPERATION

Once the Network Connection Agreement is in place, the DFO and TSO can complete the detailed design and procure the relevant equipment needed to construct and install the connection as per the terms of the agreement. Prior to commissioning, the TSO may review and witness any relevant DFO construction and testing to get assurance that the new assets will interface correctly with the existing gas network causing no safety, integrity or operational issues. The TSO and DFO will develop and agree the relevant project commissioning procedures to manage the process and set out clear lines of responsibility.

Once the facility enters the operational phase, the DFO and TSO shall cooperate in accordance with the Network Entry Agreement which for example shall reference local operating procedures, access, maintenance and emergency arrangements.

6. COMMERCIAL OPERATION

The Network Entry Agreement will stipulate that the DFO must either become a Shipper or procure Shipper(s) services before any gas, including commissioning gas, can be entered into the gas transmission network. A Shipper is a party to the NI Network Gas Transmission Code (Network Code). The Network Code governs the relationship between the TSOs and Shippers and contains the rules for transporting gas on the gas transmission network. A Shipper will be required to register at the Biomethane Entry Point to facilitate booking capacity and nominating gas flows into the network. The registered Shipper(s) will be responsible for the ongoing conveyance charges levied at the point.

Queries in relation to the Network Code and becoming a Shipper should be addressed to GMO NI.



CAVEATS & WORKING PRINCIPLES

- 1.** The connection of new biomethane facilities to the Transmission networks is dependent on the TSOs receiving approval from the Utility Regulator (if required), to progress a connection application and approval from the Health and Safety Executive (NI) in respect to the safety arrangements to allow biomethane injection into their networks.
- 2.** The exact costings and mechanisms of payment for connecting biomethane facilities to the Transmission networks will be detailed within the relevant agreements throughout the process. The underlying principle upon which these will be developed is the producer will pay the full costs associated with the development and installation of the connection and ongoing costs and charges as applicable.
- 3.** This connection process may be subject to change as the TSOs develop operational experience during the implementation of initial projects and this document should therefore be considered as a guide. The TSOs do not hold any liability for direct or indirect impacts which may arise due to changes to this process.
- 4.** The DFO should note that depending on the nature of the connection sought, the TSO may be subject to the formalities of public procurement in engaging consultants to undertake studies and the DFO should factor this into their timeline.



USEFUL REFERENCES AND CONTACTS



GNI (UK)

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