Biomethane Injection into NI's Natural Gas Network

Producer Update

20/04/2021

Agenda

10:00	**UR Welcome**
	Strategic Policy Context Fred Frazer – Department for the Economy
10:15	**Project Overview** Roisin McLaughlin – Utility Regulator
10:25	**Biomethane Connections** David Butler – SGN Natural Gas Stephen English – GMO NI Lisa McCarthy – firmus energy
11:10	**UR Q&A, Close**

Project Overview

Project Overview

Purpose:

Achieving readiness for biomethane injection into the natural gas network

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
- Subsidies to incentivise biomethane injection subject to DfE policy
- Facilitating Hydrogen injection is a longer term issue

Project Overview

Key Stages:

- Development of biomethane base case in co-operation with gas Distribution Network Operators, gas Transmission System Operators and Gas Market Operator Northern Ireland
- Consideration of feedback from supplier and producer updates
- Drafting of documentation needed
- Consultation e.g on network code and any licence changes
- Implementation
  - Changes to regulatory framework — *Regulatory Work Stream*
  - Technical requirements
  - Commercial/contractual arrangements — *Operator-specific Work Streams*
  - Process and system changes

Project Overview

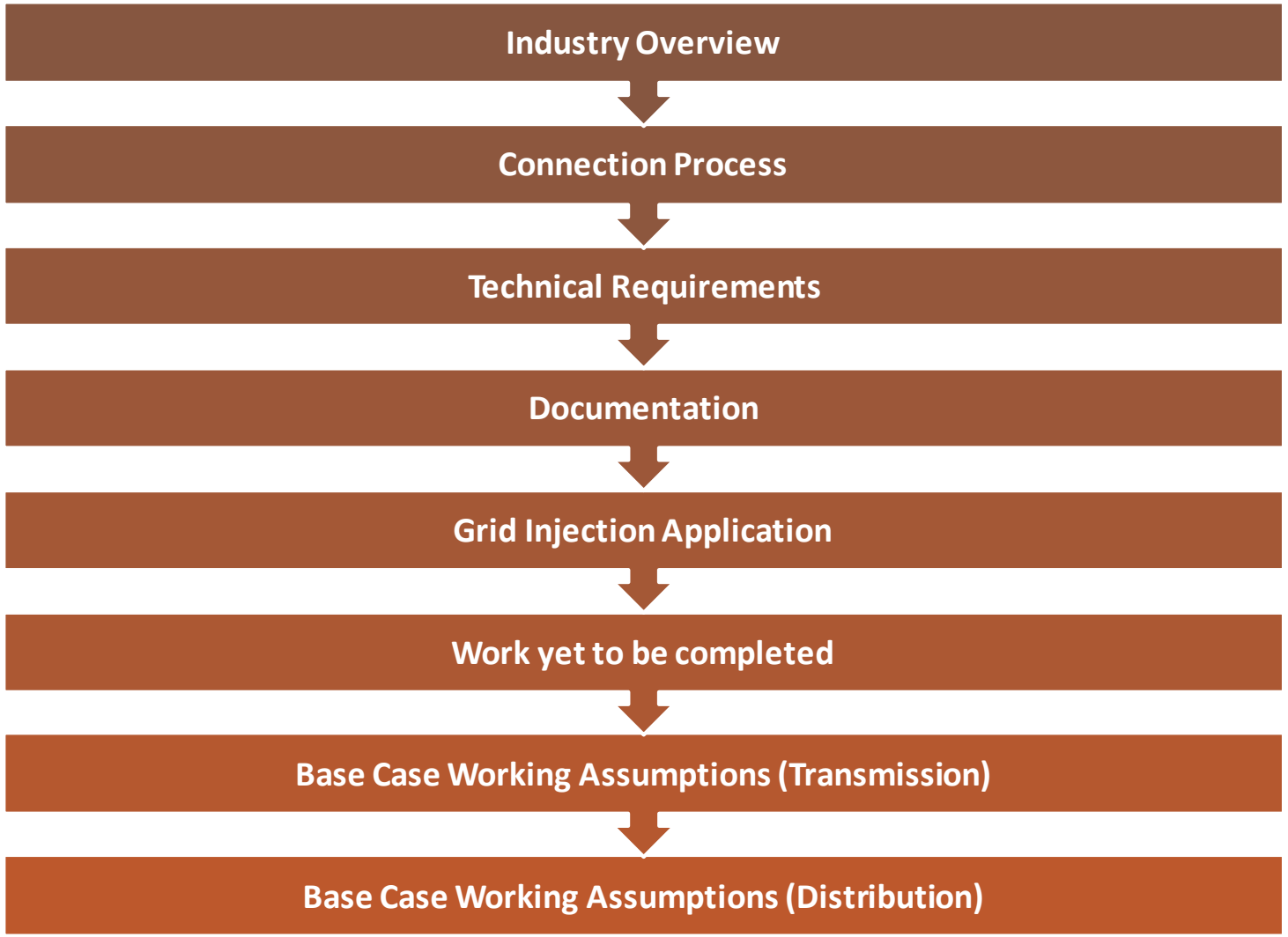
Regulatory Work Stream:

- Development and implementation of (amendments to) arrangements that:
  - are required to facilitate biomethane injection connections to the natural gas network in Northern Ireland; and
  - require regulatory decision/direction/approval/consent

  Examples:
  Gas distribution and high pressure licences, network codes, connection policies
- Members:
  Utility Regulator, Gas Distribution Network Operators, Gas Transmission System Operators, Gas Market Operator Northern Ireland,
  Department for the Economy (observer)
- Opportunities for engagement as part of modification processes (e.g. consultation on licence modifications and code modifications)

Biomethane Connections

Agenda


Industry Overview
Connection Process
Technical Requirements
Documentation
Grid Injection Application
Work yet to be completed
Base Case Working Assumptions (Transmission)
Base Case Working Assumptions (Distribution)

Industry Overview

Northern Ireland Gas Networks

History of the Natural Gas Market in Northern Ireland

- Prior to 1996, consumers in NI generally relied on oil as their main heating source
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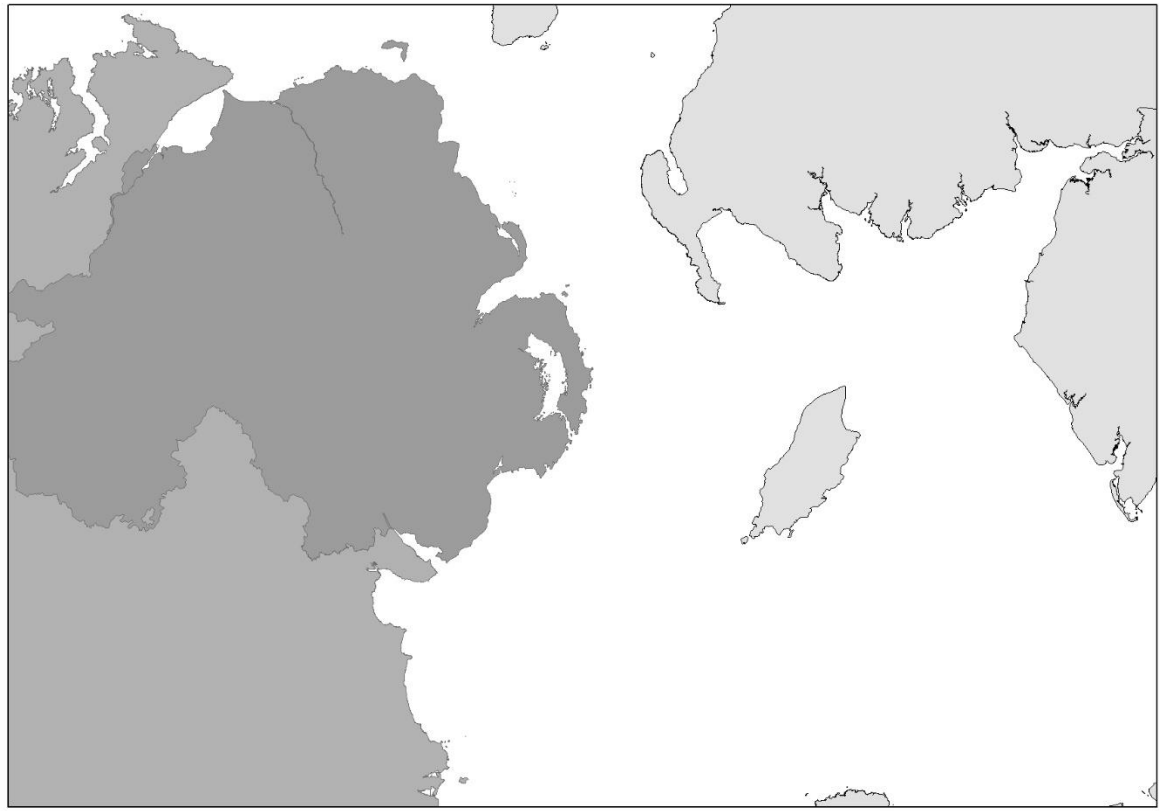
- Gas Suppliers operate under separate Licence to provide gas to customers

Distribution Network	PNGL	firmus	SGN Natural Gas
Licence Granted	1996	2005	2015
Network size	3,850km	1,740km	370km
Properties Passed	350,000	160,000	16,500
Properties Connected	235,000	55,500	1,500

Northern Ireland - Natural Gas Networks



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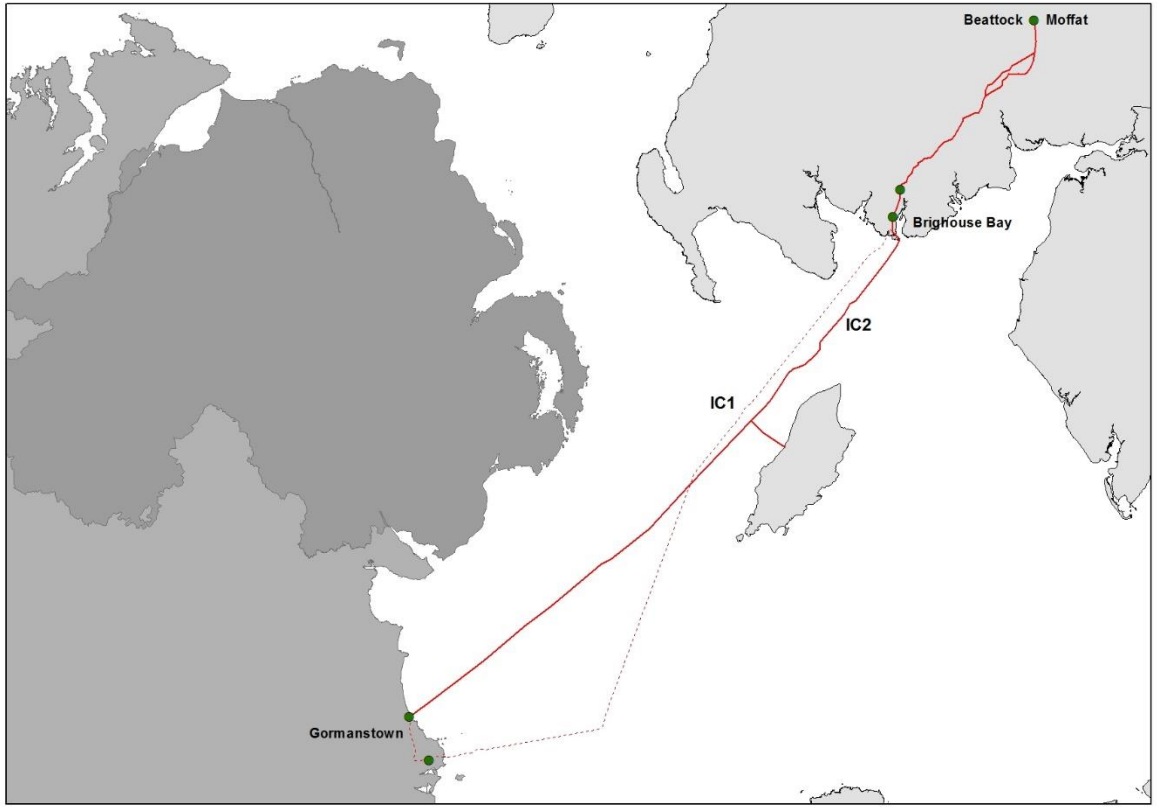

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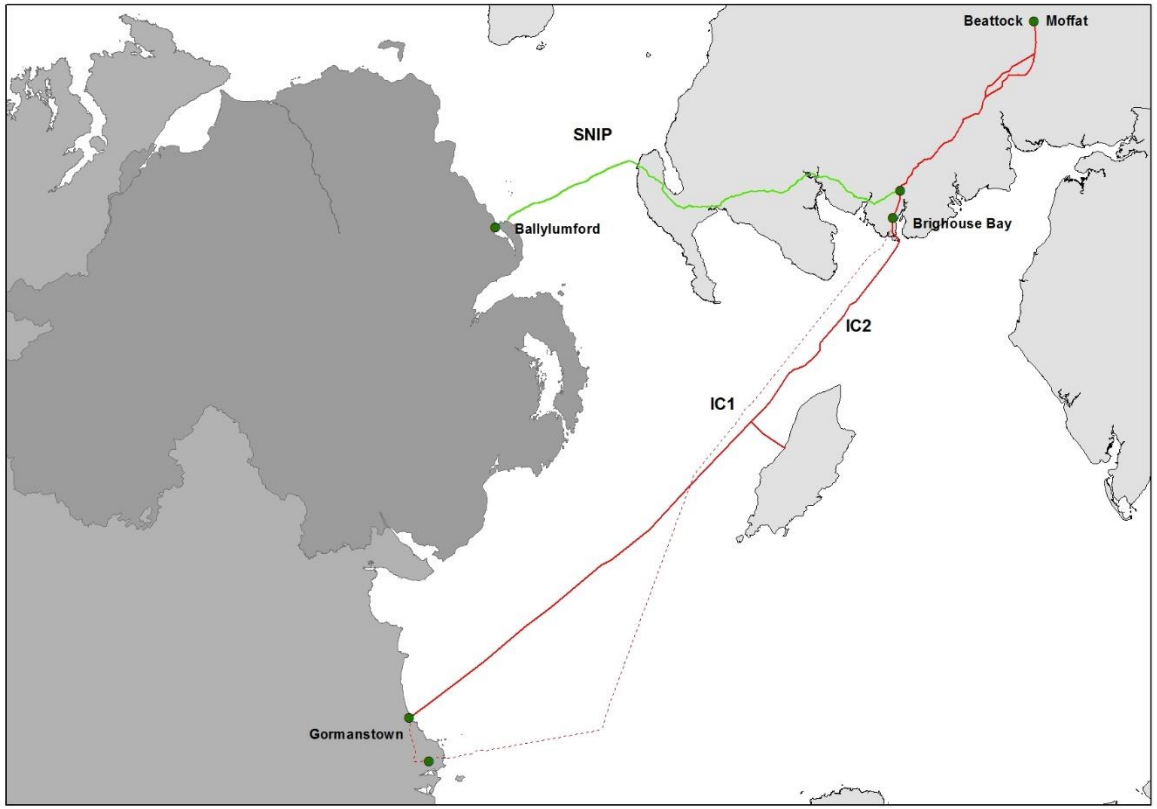

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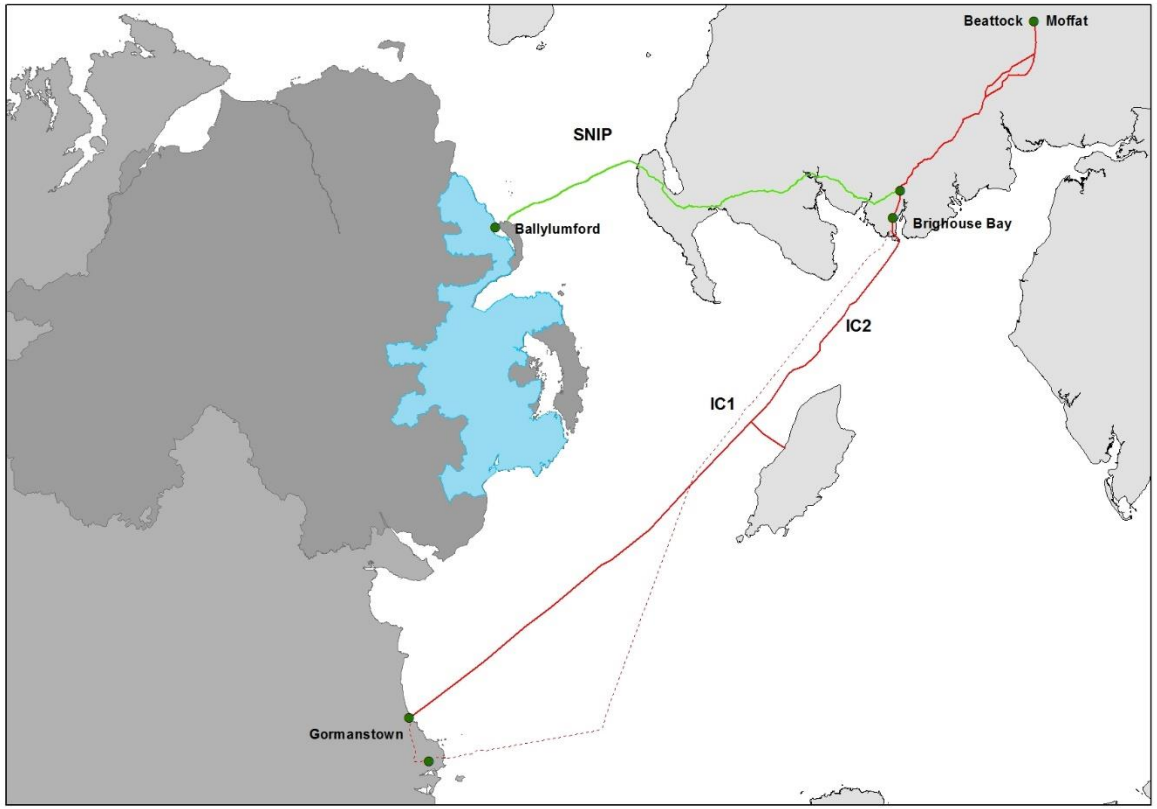

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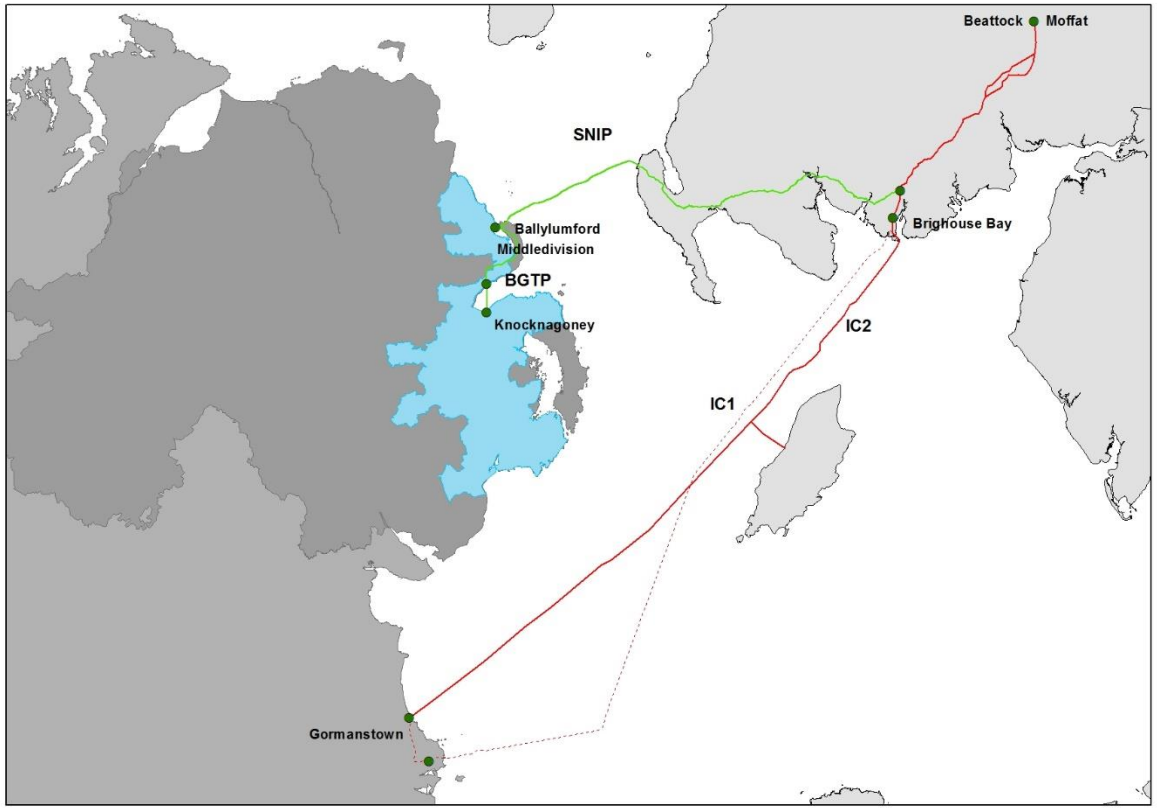

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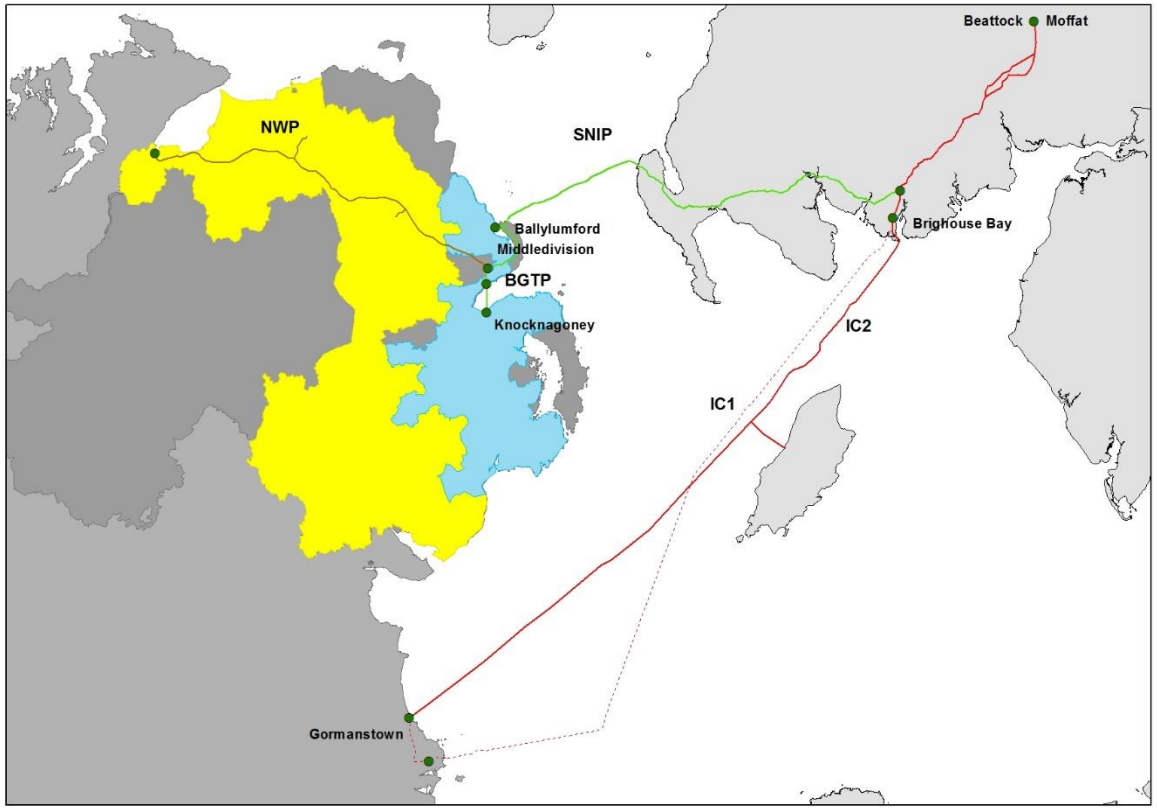

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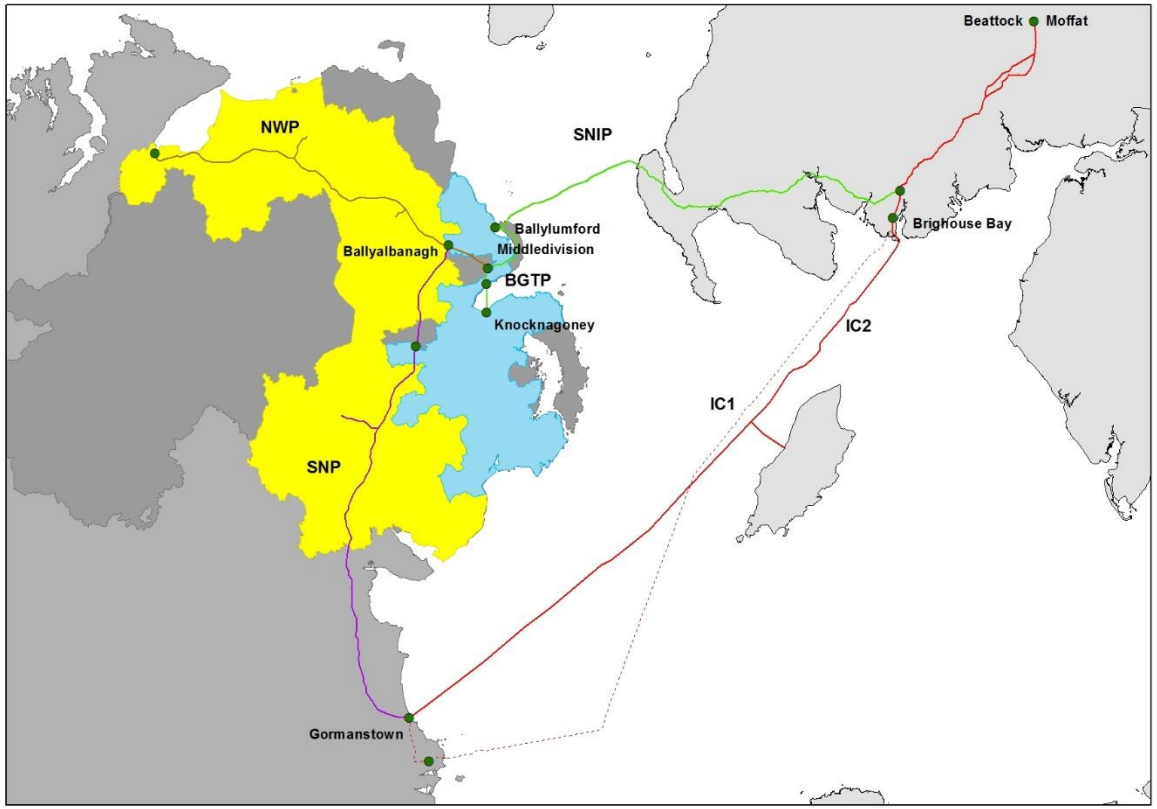

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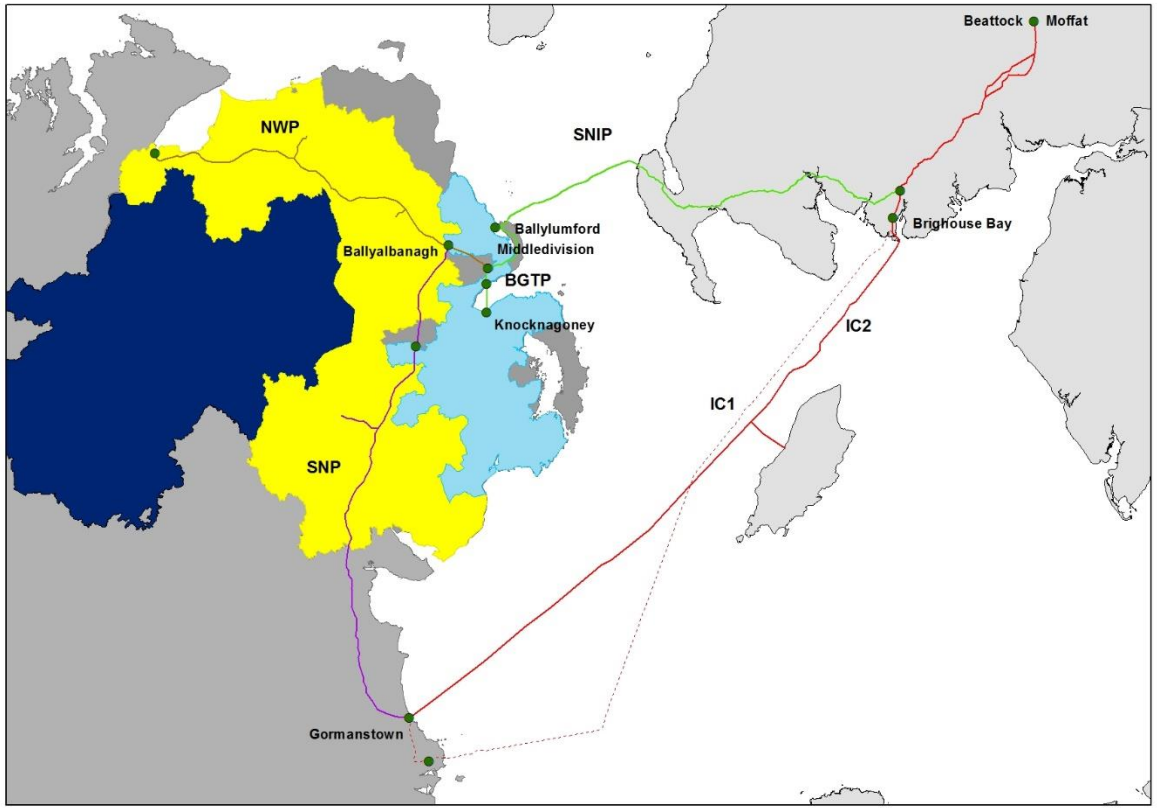

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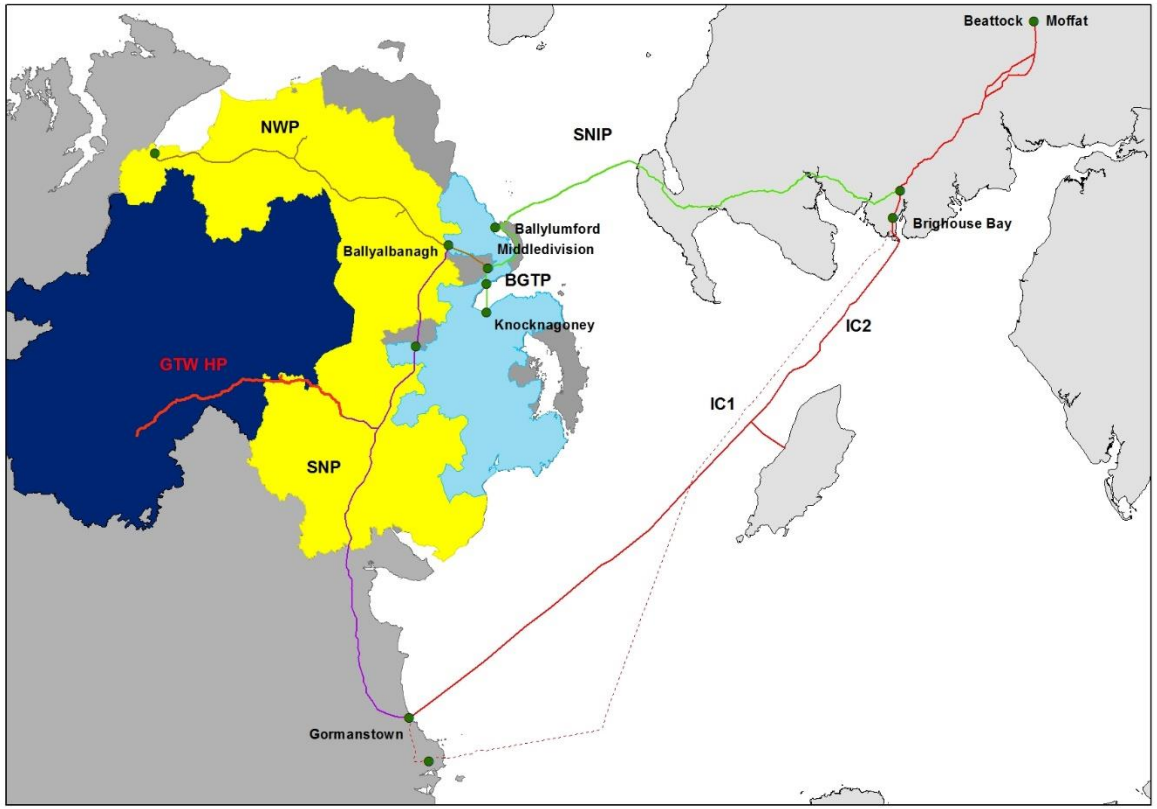


Gas Industry Chain

Upstream

- Exploration of gas and transportation to the processing and treatment plant
- Commodity risk – economics driven by market price of gas (often oil linked)

Interconnector

- Large subsea transmission pipeline which transports gas from Scotland to Northern Ireland

Up to 85bar

Transmission

- Transport of gas via large diameter, high pressure pipelines over long distances
- No commodity risk – revenues are regulated and collected from gas suppliers
- Transmits gas from initial treatment / processing plants to power generation facilities

Up to 85bar

Distribution

- Transport of gas via smaller diameter, lower pressure pipelines to homes and businesses
- No commodity risk – revenues are regulated and collected from gas suppliers
- Purely distribution infrastructure

7 bar – Intermediate Pressure
4/2 bar – Medium Pressure

Partially Regulated Supply

- Sell gas to end customers
- Transportation costs associated to distribution and transmission charges passed through to customers in tariffs
- Commodity risk – economics driven by market price of gas (often oil linked)

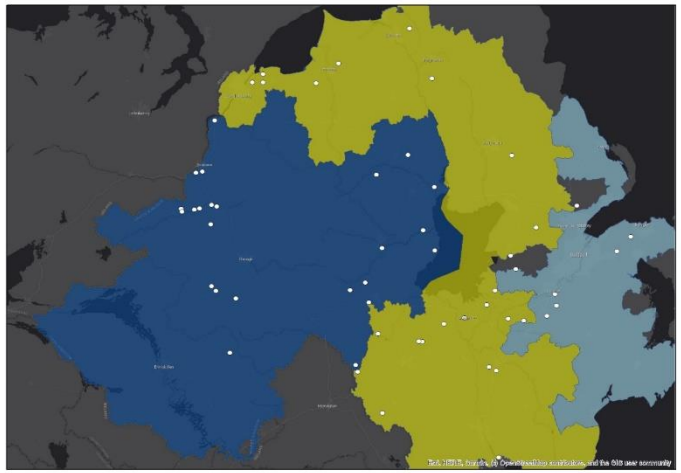
Connection Process

Gas Network and Market Operators

mutualenergy

PHOENIX NATURAL GAS

firmus energy



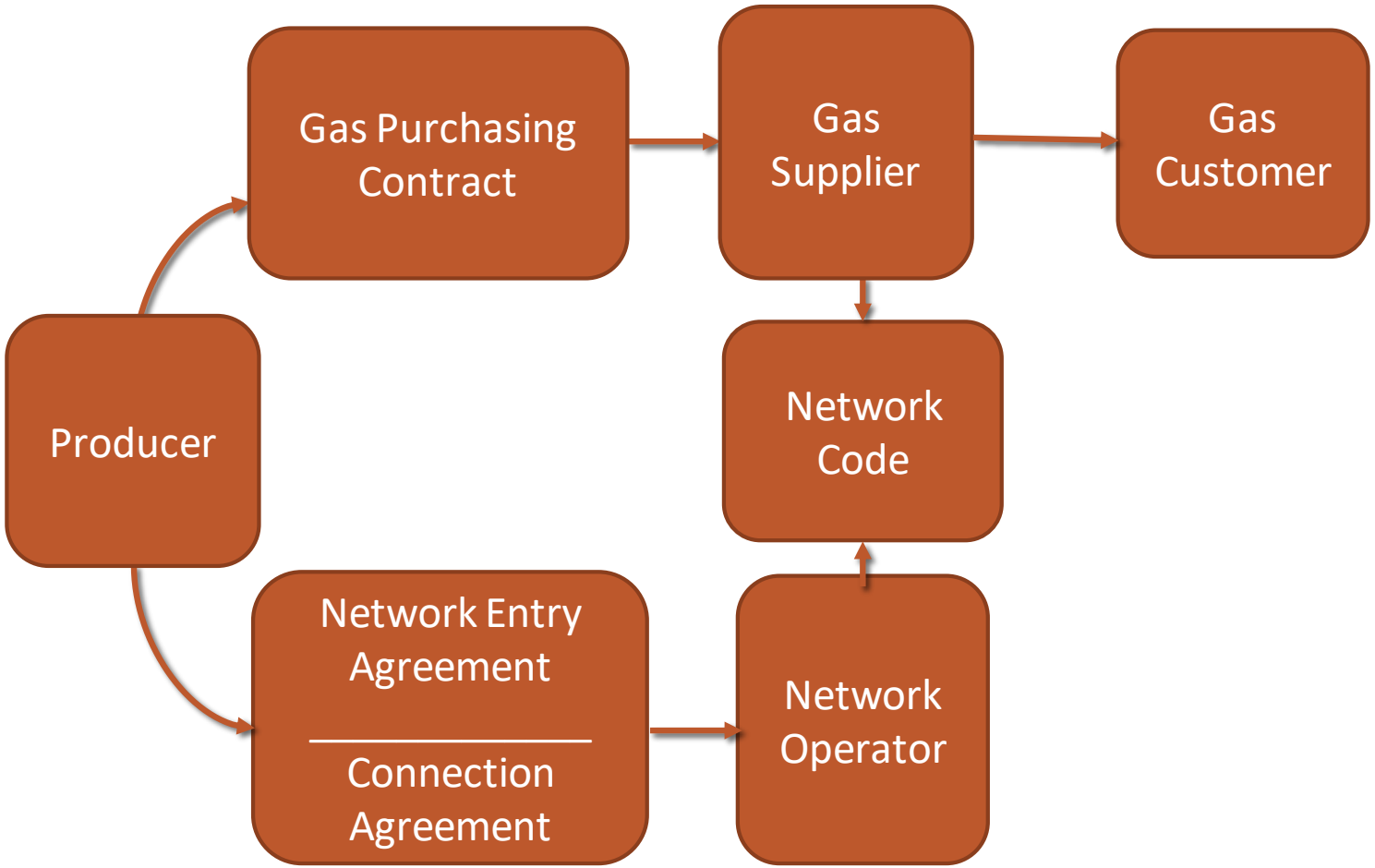
SGN Natural Gas

GMO Northern Ireland

GNI (UK) Ltd.

SGN Your gas. Our network.

Necessary Contractual Arrangements



Technical Requirements

Biomethane Injection – Technical Update

Type of Connections

- Single Point Injection
  - Primarily Distribution
  - Possible Transmission
- Injection Hubs
  - Suited to Transmission
  - Distribution possible

Factors to Consider

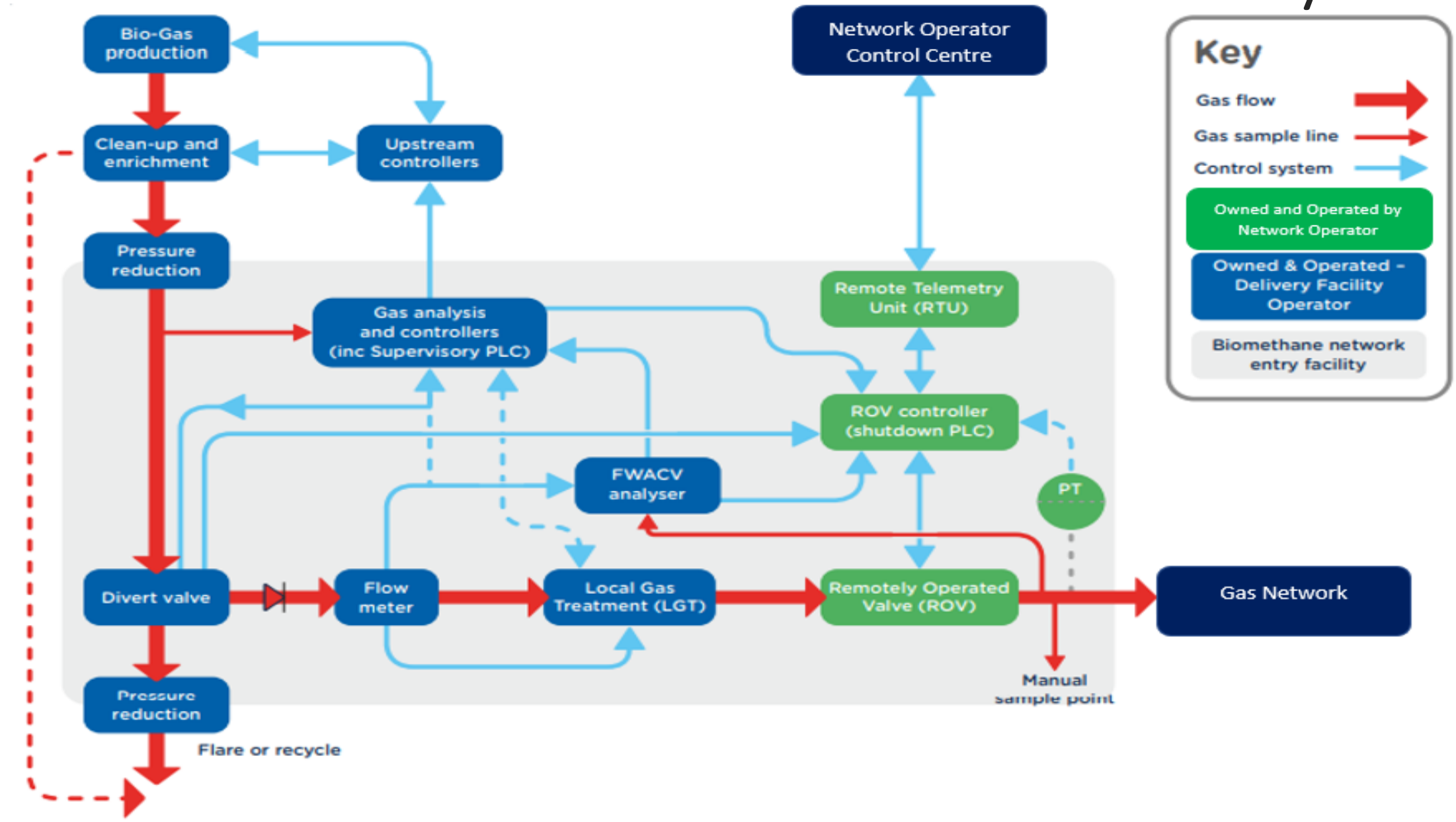
- Network Capacity / Demand
- Network Configuration
- Network pressure
- Seasonality of demand / production
- Available line pack

Biomethane Injection – Technical Update

Key Elements

- Pressure regulation and metering
- Gas quality monitoring
- Odorising – including accreditation process needed by producer – including interaction with environmental agency
- Propane Addition (to increase CV)
- Remote Operated Valve (ROV)
- Producer owns GEU / network operator owns ROV and associated telemetry (SCADA)

Technical Schematic of a Minimum Connection Facility



Documentation

Regulatory & Legal Requirements

- **Licence Requirements – to be determined by the Utility Regulator**
- **Network Code Modifications – to be determined by GNOs and Utility Regulator**
- **Network Entry Agreement – all technical and operational requirements must be met**
- **Biomethane must meet all Gas Safety (Management) Regulations 1996, which stipulate the quality of the gas that is acceptable**
- **The amount of energy released when a volume of gas is burned is measured by the Calorific Value (CV) of the gas and must comply with The Gas Calculation of Thermal Energy Regulations 1996**

Required Documentation

Connections Agreement

A Connection Agreement is required between both parties to ensure the installation is fit for adoption and has been designed and constructed in accordance with the Functional Design Specification. The installation will also require validation and commissioning.

There will be a charge associated with this process, which will form part of the agreement.

Other costs such as easement payments to landowners to secure the pipeline route, unforeseen costs (such as poor ground conditions) and costs due to the actions of third parties or a charge to the agreed scope of work are added to the base cost. We will provide the relevant documents to support such costs and where applicable, programme changes.

Network Entry Agreement

A Network Entry Agreement (NEA) is an enduring document between both parties which sets out the technical and operational conditions for the connection. The NEA is agreed between the producer and the network operator.

As part of the NEA a risk assessment of the gas quality must be undertaken to understand more fully the implications on the network.

The timescales to complete these elements of the project can vary depending on the project complexity

Required Documentation

Initial Enquiry

This provides the enquirer with an indicative view on the suitability of the network operators pipeline to accept the volume of biomethane gas they wish to inject. It will confirm the location and pressures of the mains in relation to the site, the diameter and material of the mains and the suitability of the main(s) to accept the volume of distributed gas.

Capacity Study

Builds on Initial Enquiry and develops detailed network analysis on specific site location to understand network constraints. This report is a comprehensive analysis of the network's ability to accept gas for injection at your requested connection point and is chargeable.

Functional Design Specification (FDS)

The FDS set out the technical requirements a producer has to meet on the 'minimum connection model'.

Local Operating Procedures (LOPs)

The LOPs are day-to-day procedures. These procedures outline details relating to the notification of intended gas flows, confirmation of actual gas flows, site security, management of flow rates, pressures and gas quality They will also provide information relating to maintenance and emergency arrangements.

Grid Injection Application Process

Becoming a green gas Producer*

Initial Enquiry

Form an indicative on the potential for the network operator to accept the entry capacity

Capacity Study

Undertake a detailed analysis of the distribution network to understand the drivers and deliver gas to the network

Feasibility Study

A feasibility study may be required dependent on the complexity and pressure

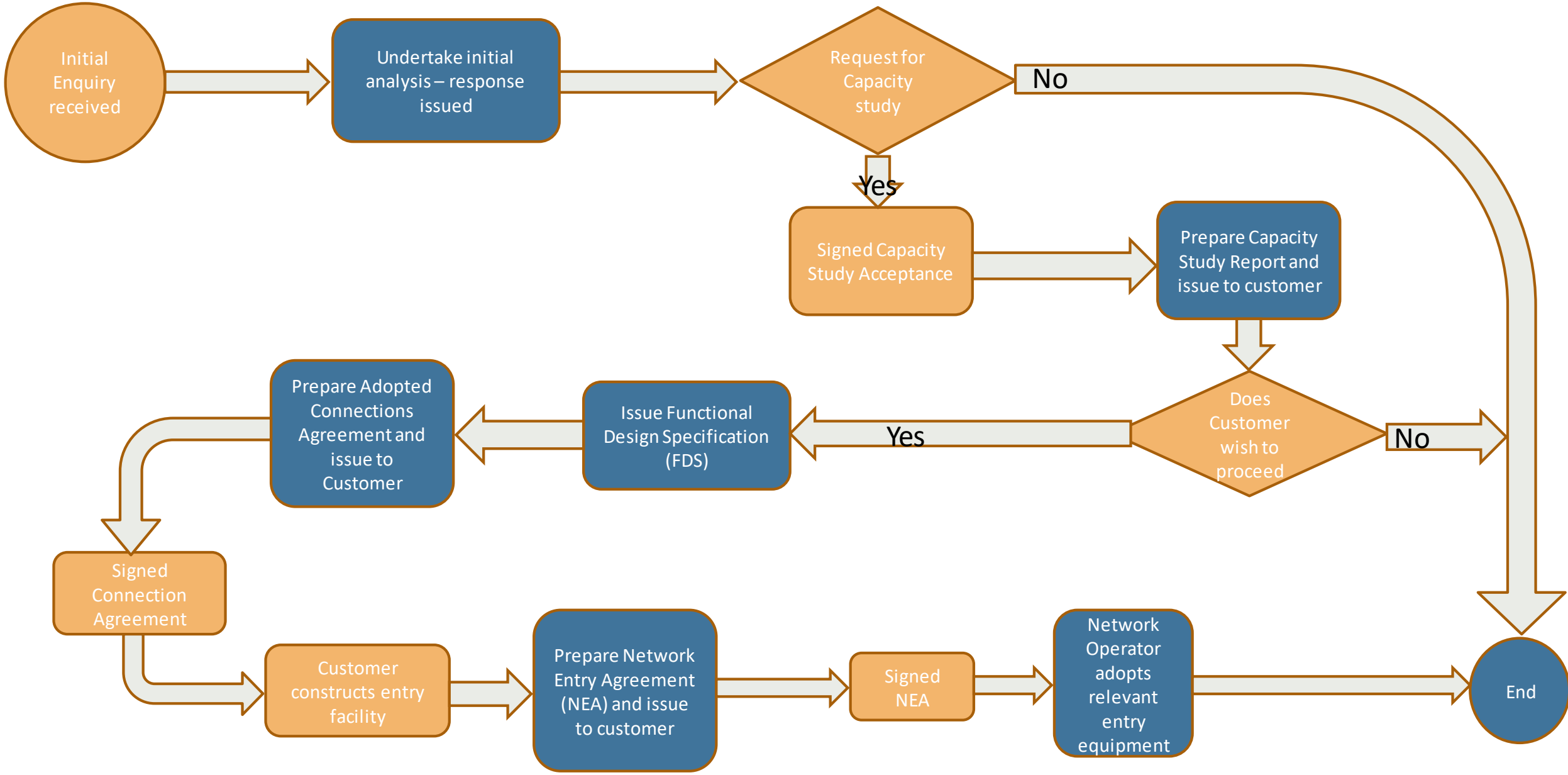
Adopted Entry Facility

The delivery facility operator can design, procure and install the approved Entry equipment for the adoption of specific items by us

Agreements

Formal agreement to undertake the work through a Network Connection Agreement (NCA) and Network Entry Agreement (NEA)

*Distribution Process



*Distribution Process

Work yet to be completed

Work yet to be completed

- GNO Specific Functional Design Specs
- SCADA Requirements
- Capacity Study methodologies to be developed
- Exemption from GSMR – submission to HSE(NI) required
- Drafting of required documentation
- Ongoing Operational Arrangements
  - Local Operating Procedures
  - Emergency Call Outs
  - Gas Quality Validation / Audits
- Costs – site / GNO specific

Conveyance (Transmission)

Introduction

- Gas Market Operator for Northern Ireland (GMO NI) is a joint team made up of staff from the TSOs and is responsible for managing the market related activities of the TSOs

- These activities include:

    - Administration of and Shipper's accession to the NI Network Gas Transmission Code
    - Management of the Delphi IT system
    - Tariffing and billing
    - Shipper engagement

- GMO NI's role is limited to the Transmission regime and does not carry out Distribution related activities

Shipping Arrangements

- To facilitate the injection and onward travel of biomethane injected into the Transmission network, a Shipper is required

- The Shipper will be required to:
  - Book Entry Capacity at the Injection Point
  - Nominate the entry of biomethane into and exit out of the network
  - Alternatively, the Shipper may trade the biomethane with another Shipper at the NI Balancing Point
  - Place credit and pay the relevant transportation charges (different from connection costs)

- Producers will be required to contract with an existing or prospective Shipper or become a Shipper themselves

- At minimum this will require a Supplier Licence (granted by the Utility Regulator) and accession to the NI Network Gas Transmission Code

- Please contact GMO NI should you require more detail on becoming a Shipper

Onward Use

- Shippers will be able to use biomethane injected into the Transmission network to:
  - Contribute to balancing their NI exit demand / Supplying customers with ‘green gas’
  - Trade at the NIBP
  - Export to GB and ROI via Virtual Reverse Flow (subject to sufficient forward flow)
  - A combination of the above

Biomethane Conveyance Arrangements

- GMO NI have considered the changes required to the conveyance arrangements to facilitate the injection of biomethane into the Transmission network

- When required, the changes may include (but not limited to):
  - The creation of a new Entry Point
  - The introduction of new Entry Capacity products
  - Modification of nomination and allocation rules
  - Updated tariff and billing arrangements

  - *Please refer to the Supplier update presentation for more detail on the working assumptions*

- Following the Supplier and Producer updates, GMO NI, in co-operation with the Distribution Network Operators and Utility Regulator will review the base case assumptions and consider any further requirements

- GMO NI will be developing business rules and when required, shall incorporate these into the NI Network Gas Transmission Code and modify the Delphi IT system

Conveyance (Distribution)

Introduction

- Each Distribution Network Operator (DNO) in NI is responsible for managing the conveyance arrangements relevant to their network, in accordance with their Licence and Distribution Network Code.
- The Distribution Network Codes are (to a large extent) aligned and there is a requirement for DNOs to align on any future proposed modifications to receive Utility Regulator approval.
- DNOs will collaborate to develop the processes and Network Code changes required to facilitate Biomethane Injection.
- The arrangements will facilitate both single injection points or injection hubs on the Distribution networks.
- The DNOs will work closely with GMO NI to develop the industry arrangements.

Supplier Arrangements

- The Distribution Network Code facilitates a simple entry / exit regime, i.e. gas is delivered to the network by Gas Suppliers (at present via the NI Transmission network only) and is off taken at a customer's premises within the network.

- The Distribution Network Code refers to a Gas Supplier. To deliver gas to an entry point you must be a Gas Supplier with a Supplier Licence (granted by the Utility Regulator) and acceded to the applicable Distribution Network Code.

- Biomethane injection connections to a Distribution network will be treated as an entry point.

- Producers will be required to contract with an active Gas Supplier on the applicable Distribution network to take receipt of any biomethane injected into the network.

- The Network Entry Agreement will include requirements regarding Gas Supplier registration.
  - Individual injection point – 1 Gas Supplier per individual injection point
  - Injection Hub – Multiple Gas Suppliers will be facilitated

Biomethane Conveyance Arrangements

- DNOs have considered the changes required to the conveyance arrangements to facilitate the injection of biomethane into the Distribution networks

- The changes may include (but not limited to):
  - Modification of nomination and allocation processes –
    - Gas Suppliers will be required to provide the DNO with daily forecasted volumes for any Biomethane Injection
    - This information will be used in the demand forecasting processes and provided to GMO NI for network management and balancing purposes
    - The DNO must have access to the daily metered volumes recorded at the Biomethane injection point. These volumes will be used in the daily volume allocation processes.

  - *Please refer to the Supplier update presentation for more detail on the working assumptions*

- Arrangements may change as the industry develops - we are keen to engage with the wider industry and stakeholders

- In co-operation with GMO NI and Utility Regulator, DNOs will consider feedback from Supplier and Producer update meetings to ensure that the Base Case assumptions remain appropriate

Key Contacts

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Questions and Answers