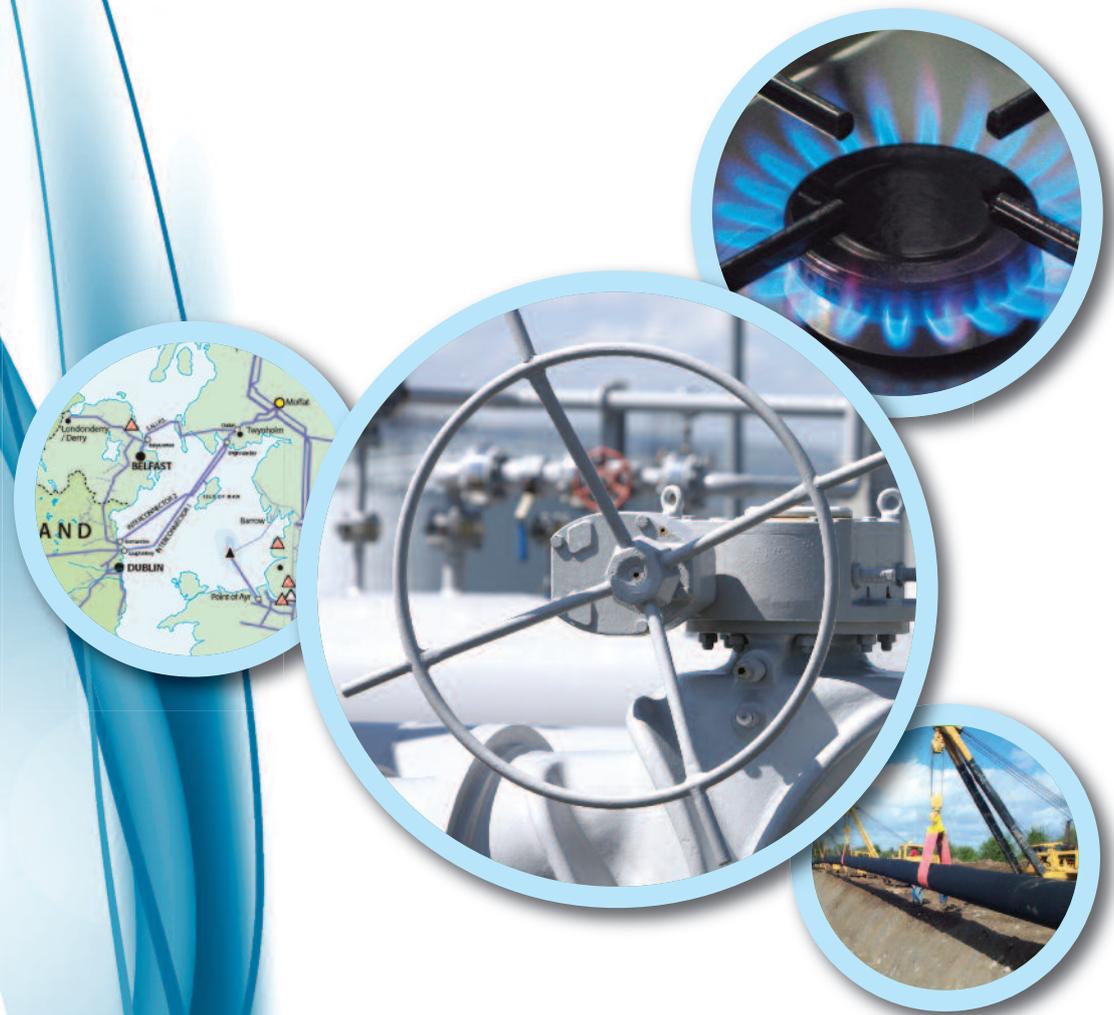


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TRANSMISSION

# Natural Gas in Northern Ireland Winter Outlook 2013/14



Premier Transmission is a subsidiary of Mutual Energy Limited

mutualenergy 



## Introduction



Welcome to the first ever 'Winter Outlook' from Premier Transmission on behalf of Northern Ireland's Mutual Energy group of companies.

Premier Transmission sits at the heart of Northern Ireland's natural gas industry, owning and managing the sub-sea Scotland/Northern Ireland Pipeline (SNIP) through which all of the gas that is consumed in Northern Ireland, actually flows. Our group also owns and manages the main gas transmission pipeline bringing bulk gas to the demand centre in greater Belfast.

As a mutual company we act at all times in the best interests of Northern Ireland's energy consumers and we therefore hope this publication is of assistance to our stakeholders in providing an understanding of the outlook for gas in Northern Ireland in the period ahead.

It is of course recognised that there are many vagaries in making future projections about gas. We do not control the overall supply environment, or indeed the weather. However we are content to still make our best assessment.

Certainly for our own part, we are confident that in the period ahead we will continue to meet the needs of our customers, reliably, efficiently and safely.

We would welcome any comments/suggestions in relation to this first 'Outlook' publication.

**Paddy Larkin**

**Chief Executive**

**Mutual Energy Limited**

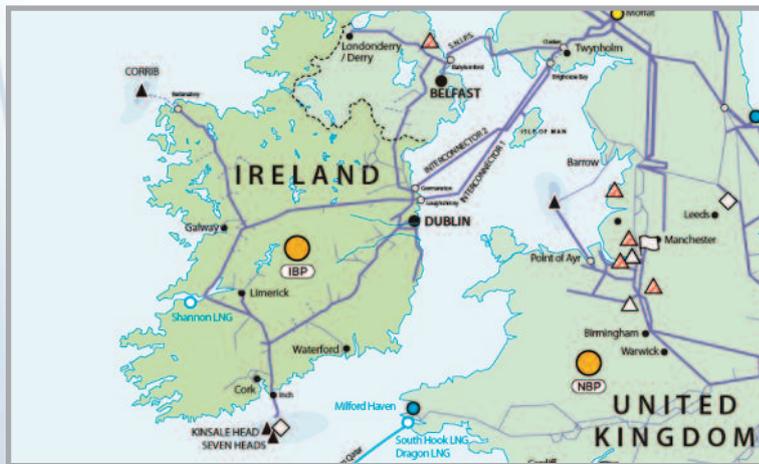
## 1.0 | Overview

All the natural gas used in Northern Ireland is transported from the Great Britain system in our (Premier Transmission) pipeline system across the Scotland to Northern Ireland Pipeline (“SNIP”). Premier Transmission also operates the main transmission pipeline running from the ‘SNIP’ to greater Belfast. The two other major pipelines in Northern Ireland the North/West (from Co. Antrim to Derry) and the North/South (from Co. Meath to Co. Antrim) are owned by Irish State owned gas utility Bord Gáis Éireann (BGE). We provide a service to gas shippers from Moffat in Scotland (A node on the main UK gas transmission grid) to exit points at the AES Ballylumford gas-fired powerstation, the connection with BGE (NI) pipelines at Carrickfergus and Phoenix gas distribution exit points in Belfast. From these connections the BGE (NI) pipeline supplies the Coolkeeragh gas-fired power station near Londonderry and BGE subsidiary firmus energy supplies customers along the way, while Phoenix Gas services 160,000 industrial commercial and domestic customers in greater Belfast.

Upstream of the SNIP, BGE(UK) operates the network in the South West of Scotland, having taken the gas in from National Grid at Moffat. Premier Transmission has effectively a “pipe within a pipe” contractual relationship with BGE (UK) allowing Northern Ireland the ability to flow 8.08 mscm per day of natural gas through the SWOS pipeline, approximately 26% of its full capability.

All contractual arrangements in this chain between National Grid, BGE UK, and Premier Transmission are based upon designated minimum gas pressures. In practice all Transmission System Operators have consistently provided higher pressure, referred to as the normal anticipated operating pressure.

Premier Transmission Ltd is forecast to be able to meet all contractual obligations to supply gas as defined in the Network Code. This, the first Winter Outlook issued by Premier Transmission Limited, covering the network including the assets of Belfast Gas, provides an informed view of the supply and demand status for winter 2013/14 and a



view on the ability to supply gas above the contractual minimum. The extra services provided above mainstream contractual requirements are typically higher pressure provided and greater flexibility, the ability to vary gas supplied during the day.

This statement should be read in conjunction with the Northern Ireland Gas Capacity Statement, which deals with system constraints at contractual input pressures upstream and uses a 1 in 20 winter as the demand scenario.

In 2012/13, Northern Ireland received 100% of its gas supply through the Scotland to Northern Ireland pipeline via the Moffat Entry Point. This report references the views expressed by both National Grid and Gaslink who operate assets on either side of the Moffat Entry point. The North South pipeline also has the potential to supply gas to Northern Ireland via Gormanstown. However no capacity has been booked at Gormanstown and therefore the winter outlook does not consider this as a supply source for Northern Ireland.

## 2.0 | Executive Summary

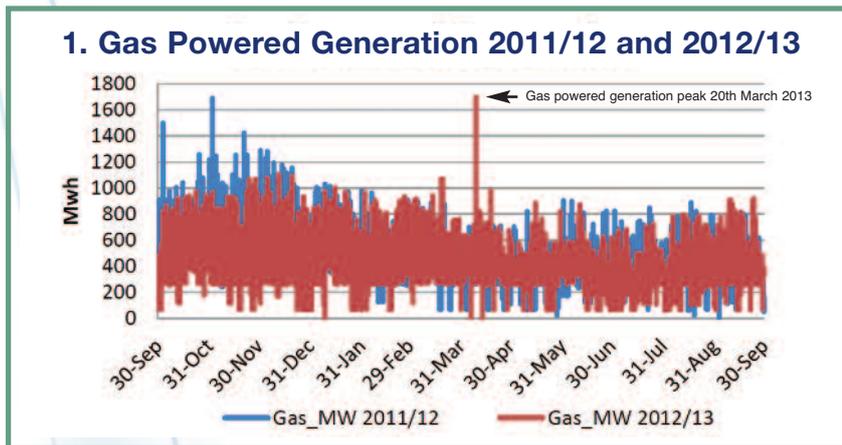


- Forward energy prices for winter 2013/14 continue to favour coal rather than gas as the preferred source of fuel for power generation with overall gas take forecast lower than 2012/13 as a result.
- Based on a forecast of a colder than average winter, peak gas demand is likely to be at the high end of historical averages;
- Upstream restrictions on within day nomination changes in the chain from National Grid to BordGais UK will be reflected in the Premier Transmission Network Code and the pipeline will be operated to comply with these restrictions;
- The latest gas demand forecast predicts Moffat flows will approach capacity limits in the event of winter peak conditions occurring and consequently reducing the ability of the Northern Ireland system to provide pressures or flexibility in excess of the contractual position with shippers in Northern Ireland. <sup>(1)</sup>
- The system has sufficient capacity to supply the contractual obligation to shippers.
- When within day capacity becomes constrained, usually as nominations change in the power sector in response to electricity system operator instruction, there are special arrangements in place to instruct one of the gas stations to cease gas take to allow the other to run. An occurrence of such an event is moderately likely over the winter.
- Shippers who require higher levels of flexibility over the winter 2013/2014 should consider either acquiring capacity on the South North Pipeline to give them the flexibility within day or reviewing their current contractual agreements in line with the technical constraints of their operational facilities.

(1). <http://www.gaslink.ie/media/7896WinterOutlook2013-141.pdf>

### 3.0 | Winter Review 2012/13

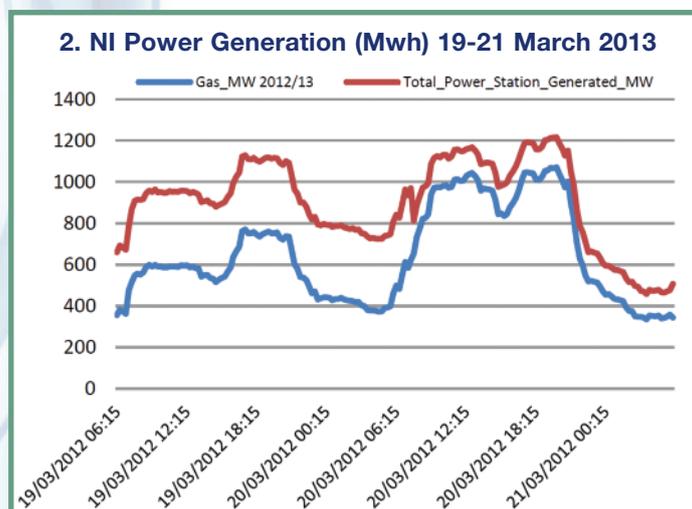
The 2012/13 winter temperature was approximately 11% colder than the 30 year UK average. It was the coldest March since 1962 and the equal-second coldest in the series from 1910. In March the mean temperature was 2.8 °C, which is 3.1 °C below the 1981-2010 average.



Increased power generation by coal, interconnection and an increased contribution from renewables resulted in an 11% reduction in Power Sector gas demand in Gas Year 2012/13 compared to the previous year. The reduction was partially offset by the continued growth in demand by the Distribution Sector. The net result being that Annual gas demand in Northern Ireland contracted by approximately 3% in gas year 2012/13 compared to the previous 12 months.

The 2012/13 PTL peak day throughput of 6.54 mscmd occurred on the 20th March 2013. Northern Ireland demand is heavily influenced by the power generation sector. A significant proportion of the Peak day load was the result of the dispatch of gas fired power generation units not normally in operation. This is illustrated in Graph 2 below demonstrating the proportion of Gas Fired Power Generation over a 3 day period.

Network Modelling indicates that due to the lack of day ahead notice of increased demand had the Gas Transmission network not had significant line pack on the 20th March 2013 the pressure in the network would have declined to the extent that Gas Powered Power generation would have been interrupted and one of the stations would have needed to switch to backup fuel. This reinforces the importance of accurate and timely gas nominations.



## 4.0 | Forecast for Winter 2013/14

### 4.1 | Availability upstream

As all Premier Transmission’s gas comes from the Great Britain (GB) system, any consideration of the availability of gas in Northern Ireland is dependent upon the availability of gas in Great Britain. National Grid has reported that the significant diversity and capacity of supply in GB is well in excess of maximum demand considering both power generation as well as 1 in 20 winter weather conditions. Less than half of the total gas supplies to the UK are met by the UK continental shelf or North Sea. The balance is received via pipelines from Norway, and continental gas through the Bacton Zeebrugge (IUK) interconnector and Balgzand to Bacton (BBL) pipelines. There are also large gas storage facilities around the UK and sites which can receive liquefied natural gas shipments. The availability of gas storage to the network has been slightly increased due to two facilities increasing the amount they can deliver on any given day. This is further discussed in the National Grid Winter Outlook. <sup>(2)</sup>

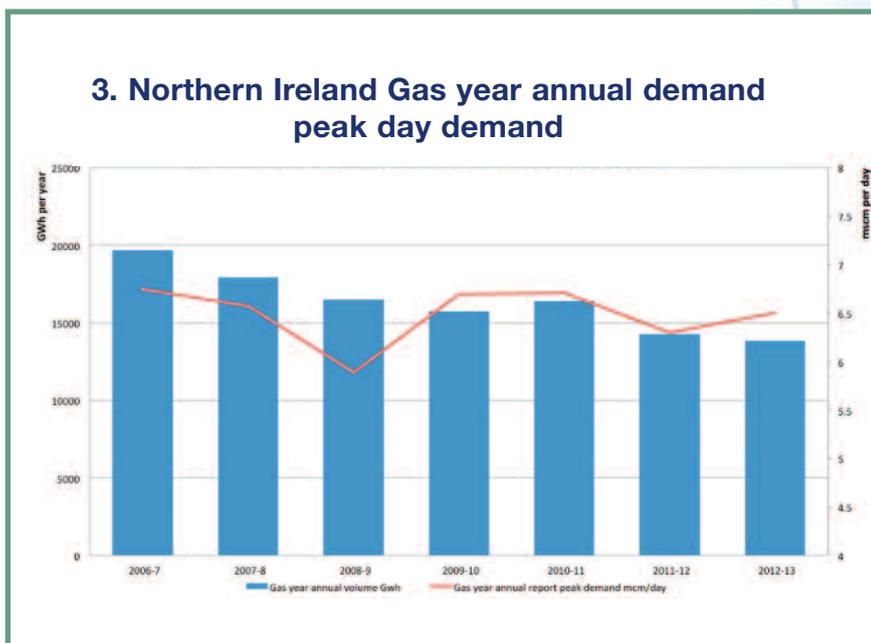
### 4.2 | Northern Ireland forecast

Assuming that shippers can access sufficient gas in GB, Premier Transmission can meet all contractual amounts to shippers. Looking at the key factors influencing whether gas shippers on the Premier Transmission and Belfast Gas systems can be provided with extra pressure and flexibility in gas take throughout the day, there are two key parameters:

1. the forecast peak demand on the system;
2. the pressure provided upstream by National Grid and Bord Gais;

#### 4.2.1 | Forecast peak demand

The historic peak demands in Northern Ireland are shown table 3.



(2). <http://www.nationalgridmedia.com/winteroutlookreport.aspx>

The two main influences on the demand are the underlying weather and the interaction with the electricity system, with peak demand typically occurring on a cold still day where the gas fired power generators are running to high electricity demand and in the absence of significant wind generation.

The 5 year historic range of gas annual demand is 14,288 GWh/y to 16,500 GWh/y. There are no fundamental changes in the electricity network from last year which would clearly point to a change in the power sector peak demand this winter. The Power sector peak day demand forecast for 2013/14 remains flat as no new gas driven power plant has been connected to the Northern Ireland Gas Transmission Network. Although annual power sector demand is reducing, the peak day demand remains constant as all existing gas plant could be dispatched to meet peak day power demand.

In respect of the weather outlook the Met office forecast for December 2013 – February 2014 published for the purposes of contingency planning is :

“For December-January-February as a whole uncertainty is quite large but below average temperatures are more likely than above average. Overall the probability that the UK mean temperature for December-January-February will fall into the coldest category is between 20 and 25% and the probability that it will fall into the warmest category is between 10 and 15% (the 1981-2010 probability for each of these categories is 20%)”

**Based upon the increasing load in the domestic sector and the forecast for below average temperatures we would expect the peak demand to be in the higher end of the historic range, potentially a new high.**

#### 4.2.2 | Pressure provided upstream

The maximum technical capacity of the Moffat entry point in south west Scotland is determined by the maximum technical capacity of Beattock compressor station. The main driver of capacity at Beattock compressor station is the available pressure from the National Grid NTS system at Moffat.

The current maximum theoretical technical capacity of Beattock compressor station has been assessed at 342 GWh/d (31.0 mscmd) (This is discussed further in the Gaslink Technical Capacity Statement.) <sup>(3)</sup>

As per the existing Pressure Maintenance Agreement (PMA) National Grid is required to provide gas at a minimum pressure of 42.5 barg at Moffat for flows up to 26 mscmd. They have also advised a higher Anticipated Normal Off-take Pressure (ANOP) pressure for Moffat of 47 barg (i.e. the expected pressure under normal circumstances). This is discussed further in Gaslink Network Development Plan 2013. <sup>(4)</sup>

<sup>(3)</sup>. <http://www.gaslink.ie/media/BGETransmissionNetwork-TransmissionNetworkTechnicalCapacities1.pdf>

<sup>(4)</sup>. <http://www.gaslink.ie/media/GaslinkNetworkDevelopmentPlan20131.pdf>

Based on this assumption, recent network modelling undertaken by Bord Gáis Networks (BGN) determined the technical outlet capacity of the Beattock Compressor Station to be 31 mscmd with an outlet pressure of 76.6 barg. Previous network modelling had determined a capacity of 32 mscmd and outlet pressure of 85 barg.

Gaslink 'Winter Outlook 2013/14' <sup>(5)</sup> indicates peak day flows through the Moffat Entry Point are expected to be high, reducing system flexibility due to the potential of pressure approaching the contracted minimum 56 barg at Twynholm. Gaslink have reported there will be limited system flexibility to accommodate within-day shipper re-nominations at the Moffat Entry Point should severe weather conditions occur.

Whilst PTL has capacity to meet its contractual booked capacity demand, if BGE controlled Twynholm pressures were to approach the contractual limit of 56 barg, system pressures would fall below the indicated design/operational limits on parts of the Gas Transmission Network. This could result in a "Capacity Shortfall event". (The steps taken when a capacity shortfall occurs are explained in Section 5.2.)

**Based upon the historic trends and the forecasts provided by BGE and National Grid, days where the pressure is at the contractual minimum of 56 barg at Twynholm in Scotland are more likely than in the past.**

### 4.3 | Forecast ability to provide additional flexibility and pressure

Capacity is sold to shippers in accordance with the European norm, based upon a flat profile of gas over every hour of the day. PTL's obligation to shippers is published within the Network Code.

Shippers may hold firm capacity on the PTL system. This entitles them to flow on a firm basis up to a maximum end of day figure maximum daily quantity ("MDQ") at their Exit Points. In addition, PTL is only obliged under the PTL Transportation Code to allow Shippers to flow firm gas at their Exit Points up to a maximum hourly quantity ("MHQ") of 1/24th of their MDQ. However they can exceed their MHQ if there is spare capacity and corresponding flexibility available on the PTL network.

Shippers can also make use of un-booked capacity by nominating on an interruptible basis either where they have no capacity booked or above their current booked capacity. In this case hourly quantities at Exit Points can be accommodated where technical limits permit.

For Winter 2013/14 under a combination of high demand at Beattock and pressure approaching the contractual minimums outlined in 4.2. above, network modelling results confirm that the infrastructure cannot provide the additional pressures historically given. Based upon this modelling there is a moderate chance of the additional pressure provided to our shippers being unavailable if demand is in the order of 6.5 mscmd. In the event this situation occurs, rules in the gas code to facilitate efficient running of the electricity system will come into force. This will entail co-ordination with the electricity system operator and the instruction of one of the gas fired power stations to cease burning gas, moving to alternative fuel if so instructed by the electricity system operator. These rules are explained in 5.2 below.

<sup>(5)</sup>. <http://www.gaslink.ie/media/7896WinterOutlook2013-141.pdf>

## 5.0 | Changes to the Premier Transmission Code

Following public consultation (Network code modification 24) OV2 was submitted to Ofgem on behalf of PTL and BGE(UK) in May of this year. The proposed changes are expected to be approved early quarter one 2014 and will be implemented with immediate effect. This modification is made at the request of BGE to reflect and accommodate restrictions upstream.

### 5.1 | Changes to facilitate upstream restrictions

Shippers nominate their gas requirements a day ahead to PTL under the PTL Code and can amend these quantities within the day by notifying PTL. The rules surrounding the timings of these renominations along with the allowed step changes are governed by PTL's upstream arrangements with BGE(UK). These arrangements are being updated to ensure clarity to PTL & BGE(UK) in the operation of the Twynholm valve and to reflect current operational requirements on the BGE(UK) SWOS pipeline. This will mean Shippers will have greater flexibility to amend their nomination quantities from what is currently in the PTL code provided that the timing of the requested changes also complies with the updated upstream timing requirements. If Shippers breach these rules they will have their nominations curtailed. The methodology behind this process is also outlined in the PTL Code.

### 5.2 | Changes to clarify within day capacity shortfalls

If at any time, PTL predicts that the amount of gas scheduled to enter the system exceeds the amount of capacity available on its system, a predicted capacity shortfall may be declared. In this scenario, PTL will take steps to reduce the amount of gas nominated to enter its system in line with the amount of capacity available in order to avert the capacity shortfall.

If PTL believes that a reduction in the quantity of gas that Power Stations have nominated to enter the system will avert the capacity shortfall, PTL will contact SONI and request that Power Station nominations are revised. This could be achieved through Power Stations switching to alternative fuels.

If PTL do not receive revised Power Station nominations or the revisions do not avert the capacity shortfall then PTL will issue a Flow Order. This requires that Shippers do not increase the quantity of gas they are scheduled to deliver to the system. However, they are allowed to reduce this quantity.

PTL will also take steps to reduce the quantity of gas that individual Shippers have nominated to deliver to the system. There is a defined order in which this occurs and which starts with the Power Stations. Currently the order is different depending on whether a capacity shortfall is declared in advance of or during the day. Proposed changes to the Network Code seek to align the order regardless of when a capacity shortfall is declared.

As there are two gas fired Power Stations in Northern Ireland, the Power Stations take turns as to who will have their nominations reduced first. The Power Station first on the list on the first occurrence of a capacity shortfall shall be second on the list the next time a capacity shortfall is declared. On the third occurrence, it moves back to first place and so on.

At the request of the Utility Regulator, an additional step has been proposed. If a Power Station is scheduled to consume a quantity of gas that exceeds the amount of capacity they have booked then this excess amount shall be the first to be reduced. Once reduced, or if there was no excess amount, PTL shall continue with the defined order.

The proposed changes are due to be approved and implemented in Q1-14.

## Glossary of Terms

**Barg** - A unit of gauge pressure.

**Beattock (compressor station)** – Gas Compressor Station

**BGE** - Bord Gáis Éireann

**Entry Point** - Entry points are those locations where natural gas is delivered to the transportation network from other connected systems.

**Exit Points** - Exit points are points at which natural gas is off-taken from the network.

**Gaslink** - Gaslink is the independent system operator with responsibility for developing, maintaining and operating the natural gas transportation system in Ireland.

**GWh** - Gigawatt hours.

**GWh/d** - Gigawatt hours per day.

**Linepack** - Line pack is a procedure for allowing more gas to enter a pipeline than is being withdrawn, thus increasing the pressure, “packing” more gas into the system, and effectively creating storage. The “packed” gas can subsequently be withdrawn when needed.

**Moffat** - The Moffat Entry Point meaning the flange, weld or other agreed mark at the final outlet from the delivery facilities, owned and operated by National Grid at Moffat in Scotland, connecting with facilities of BGE (UK) at the point at which gas enters the Transportation System.

**mscm** – Million Standard Cubic Meter.

**mscmd** – Million Standard Cubic Meters per Day.

**Network Code** - The Network Code is the hub around which the competitive gas industry revolves, comprising a legal and contractual framework to supply and transport gas.

**Nomination** - The Nomination of natural gas (delivery of a specified volume over a defined period of time).

**Shipper** - Gas shippers are entities that contract with the gas transporter to convey gas through the gas pipeline network.

**Twynholm** - Volumetric Control and Metering facility in South West Scotland.

**1 in 20 Winter** - This is defined in terms of a ‘1 in 20 winter day’; that is, the exceptional demand on a winter day which statistically occurs once in 20 years.

*premier*

TRANSMISSION



**Mutual Energy Limited**

First Floor, The Arena Building  
85 Ormeau Road, Belfast, BT7 1SH

**Tel:** +44 28 9043 7580

**Fax:** +44 28 9024 9673

**Web:** [www.mutual-energy.com](http://www.mutual-energy.com)