Commission for Energy Regulation
An Coimisiún um Rialáil Fuinnimh

Department for Business, Energy & Industrial Strategy

Joint Preventive Action Plan 2016-18
- Gas -
UK and Ireland

Information Paper

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Regulating Water, Energy and Energy Safety in the Public Interest

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Executive Summary

The Regulation

EU Member States are required to implement measures to safeguard gas security of supply. To assess a Member State's ability to supply gas, under predefined Standards (i.e. Infrastructure Standard and Supply Standard), Regulation 994 requires each Member State to prepare a National Risk Assessment. Ireland's 2016 National Risk Assessment has shown that Ireland meets the requirements of the Supply Standard and fails the requirements of the Infrastructure Standard.

Infrastructure Standard

The Infrastructure Standard is assessed by performing the N-1 calculation. To pass, a Member State must achieve a score of 100% or more. In the event that a Member State cannot fulfil the N-1 standard on a national basis, the Regulation permits the adoption of a regional approach towards meeting the N-1 standard. Ireland does not currently meet the N-1 calculation criteria on its own and so partnered with the UK to create a Joint Risk Assessment.

In order to pass the Infrastructure Standard Ireland requested the UK to adopt a Joint Risk Assessment. The Joint Risk Assessment allows Ireland to fulfill the Infrastructure Standard. Without the Joint Risk Assessment Ireland's N-1 equals 28% (without market based measures) and 35% (with market based measures). With the Joint Risk Assessment the UK and Ireland's combined N-1 equals 134%[1].

The Joint Preventative Action Plan

Under the Regulation, if Member States adopt a Joint Risk Assessment they must adopt a Joint Preventative Action Plan. This Joint Preventive Action Plan describes the preventive measures adopted by the UK and Ireland and references the established emergency plans already in place. Also, the Joint Preventive Action Plan focusses on initiatives that have the potential to improve gas security of supply between the UK and Ireland. As well as outlining the ongoing cooperation between the UK and Ireland (i.e. regional cooperation).

No Guarantee of Gas

The regional cooperation does not imply that there will be sufficient infrastructure to deliver gas to all gas customers in the UK and Ireland at all times. The failure of gas system components (i.e. at Moffat in Scotland) can have impacts for Ireland, Northern Ireland and Isle of Man, while gas supplies to GB could be unaffected. However, the regional approach does imply solidarity, burden sharing and regional cooperation between the UK and Ireland.

[1] Supply and demand values from National Grid's (UK) Gone Green scenario and Gas Networks Irelands (Ireland) Median scenario were used when calculating this N-1.

Public/ Customer Impact Statement

In event of a gas shortage, the Joint Preventive Action Plan endeavours to ensure gas continues to flow to Protected Customers. Protected Customers for each jurisdiction are defined in the table below:

GB's Definition of Protected Customer	Ireland's Definition of Protected Customer	Northern Ireland's Definition of Protected Customer
UK 'protected customers' gas volumes are split into the following definitions as per the Regulation: • Household customers; • Small and medium-sized enterprises connected to a gas distribution network; and • Essential social services where loss of gas supplies could endanger health (as long as these customers and small and medium sized enterprises do not exceed 20% of final use of gas) Protected Demand includes all loads up to 5860MWh non-daily metered (including residential and small business consumers), non-daily metered demand in Ireland, and priority load.	All NDM sector customers whose annual demand is below 5,550 MWh per annum. In addition, priority customers in the DM sector whose annual demand is between 5,550 MWh and 57,500 MWh per annum and are in the following categories: • Hospitals and Nursing Homes including retirement homes • High Security Prisons; and • District Heating Schemes and further categories of essential social services as determined by the CER from time to time.	All domestic customers, and small and medium industrial and commercial customers whose annual gas demand is below 25,000 therms/732MWh per annum.

This does not imply that there will be sufficient infrastructure to deliver gas to all gas customers in the UK and Ireland at all times. The failure of gas system components (i.e. at Moffat in Scotland) can have impacts for Ireland, Northern Ireland and Isle of Man, while gas supplies to GB could remain unaffected. However, the regional

approach does imply solidarity, burden sharing and regional cooperation between the UK and Ireland.

Structure of Paper

This UK and Ireland JPAP is structured as follows:

- **Section 1:** provides an introduction.
- **Section 2:** outlines gas pipeline connections between the UK and Ireland
- **Section 3:** contains the results of the UK and Ireland JRA 2016, which examines compliance with the Infrastructure Standard and the Supply Standard on a regional basis.
- **Section 4:** identifies preventive measures that can be applied to enhance gas security of supply between the UK and Ireland.
- **Section 5:** outlines the UK and Ireland's approach to regional emergency planning.
- **Section 6:** outlines next steps.

1 Introduction

Pursuant to the implementation of EU Regulation 994/2010 ("the Regulation"), Member States are required to implement measures to safeguard gas security of supply, including the development of a biennial National Risk Assessment (NRA), National Preventive Action Plan (PAP) and National Emergency Plan (NEP).

An integral part of the NRA is the ability of the EU Member State to meet the demand for gas in the event of a failure of the largest piece of infrastructure supplying the country (i.e. Article 6: Infrastructure Standard). This is to be demonstrated by the application of the N-1 standard. The Infrastructure Standard is passed with an N-1 value of at least 100%. The N-1 calculation is based on the failure of the largest gas infrastructure on a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years.

In the event that a Member State cannot fulfil the N-1 standard on a national basis, the Regulation permits the adoption of a regional approach towards meeting the N-1. If the regional approach is adopted, there is an obligation on the Member States involved to produce on a regional basis a Joint Risk Assessment (JRA) and a Joint Preventive Action Plan (JPAP). Where possible and necessary, the Regulation also states that a Joint Emergency Plan (JEP) should be established.[2]

As part of its compliance with the Regulation, the Competent Authorities in the UK (i.e. BEIS) and Ireland (i.e. CER) submitted their respective national Risk Assessments to the European Commission. While the UK's Risk Assessment showed that it is able to meet the N-1 standard, Ireland's Risk Assessment confirmed that it is unable to meet the N-1 standard in 2016.

Following a request from the CER, BEIS has agreed to adopt a regional approach between the UK and Ireland towards meeting the N-1 standard, as permitted under the Regulation. A corollary of the agreement between BEIS and the CER has been the development of a JRA, which was submitted to the European Commission on the 30th September 2016. The next stage in the regional approach between the UK and Ireland is the development of this JPAP, which is required to be submitted to the European Commission by the 3rd of December 2016.

[2] With reference to the JEP, both BEIS and the CER have agreed that a JEP is not currently required for the UK and Ireland. The rationale for this decision is due to the extensive emergency arrangements in place between the UK and Irish TSO's, and the broad alignment of the UK and Ireland's existing national emergency plans.

It should be noted that this JPAP does not intend to supersede the UK's and Ireland's National Preventive Action Plans, which have been prepared by BEIS and the CER, in accordance with the Regulation. Therefore, the obligations on Natural Gas Undertakings (NGUs) and other relevant bodies as outlined in the National Preventive Action Plans are not altered by this JPAP. Instead, this document focuses on initiatives that have the potential to improve gas security of supply between the UK and Ireland, as well as outlining the ongoing cooperation between the UK and Ireland.

1.1 Consultation Process

The implementation of a regional approach under the Regulation has been facilitated through the UK Ireland Emergency Group Forum. This forum meets on a bi-annual basis to discuss matters pertaining to gas and electricity security of supply including the development of this JPAP. The participants attending the UK and Ireland are outlined in Table 1.1.

Table 1.1: UK Ireland Emergency Group Forum Participants

	GB	Northern Ireland	Ireland
Government Department	BEIS	DfE	DCCAE
Regulator	OFGEM	UREGNI	CER
Gas Transmission System Operator	NGG	PTL GNI (UK)	GNI
Electricity Transmission System Operator	NGET	SONI	EirGrid

1.2 Related Documents

i. Ireland's 2016 National Risk Assessment (not publicly available);

ii. The UK 2016 National Risk Assessment

iii. The UK and Ireland Joint Risk Assessment 2016 (not publicly available);

iv. Consultation on Revision of Regulation (EU) 994/2010;

v. Ireland's 2014 National Preventive Action Plan - Gas (CER/14/785);

vi. Ireland's 2014 National Gas Supply Emergency Plan (CER/14/784);

2 Overview of UK & Ireland Gas Systems

Subsequent to the signing of the 1993 Intergovernmental Agreement, the UK and Irish gas systems have become increasingly interconnected.[3] Such connections have been facilitated through significant investment in gas pipeline infrastructure and the development of transportation agreements between the UK and Irish gas Transmission System Operators (TSOs).[4]

At present, the UK and Irish gas systems connect physically at three points, namely:

i. **Moffat (Scotland):** Moffat is the primary gas connection point between GB and Ireland, and links GB's and Ireland's gas transmission systems, which are owned by NGG and GNI respectively.

ii. **Twynholm (Scotland):** Gas is delivered from Moffat to the Northern Ireland's gas system at Twynholm (via GNI's South West Scotland Onshore System). The gas is then delivered to Northern Ireland via the Scotland to Northern Ireland Pipeline (SNIP). The SNIP is owned and operated by Premier Transmission Limited (PTL), which is a subsidiary of Mutual Energy Limited.

iii. **Gormanston (Ireland):** The South North Pipeline (SNP) is a gas transmission pipeline (which forms part of Northern Ireland's transmission system) that spans both the Irish and Northern Irish jurisdictions.

With reference to future gas network investment, it is currently not envisaged that UK and Irish gas market participants will require further physical gas connection points between the UK and Irish gas markets. In relation to enabling bi-directional capacity at cross-border gas interconnections, in 2012, both the UK and Irish Competent Authorities granted exemptions[5], where appropriate, to the relevant gas TSOs.

The UK and Irish Competent Authorities continued to monitor the Regulation requirement for bi-directional capacity at cross-border gas interconnections through the review of the Risk Assessments, which are undertaken on a biennial basis. Consequently, there is an assessment underway into the need for bi-directional capacity over the South-North Pipeline (SNP). The Competent Authorities will consider any request for further

[3] A map of the UK's and Ireland's gas infrastructure is provided in Appendix 1.

[4] Transportation Agreements between UK and Irish gas TSOs include the Connected Systems Agreement between NGG and GNI (UK), and the Transportation Agreement between GNI (UK) and PTL.

[5] Exemptions are reviewed biennially

exemption from the bi-directional flow requirement on the SNP based on the results of this assessment.

In addition, the CER granted Gas Networks Ireland an exemption from Physical Reverse Flow (Bi-Directional Capacity) at Moffat in 2012. This exemption was extended in 2014 and is currently in force.”

3 Results of UK & Ireland Joint Risk Assessment

The 2016 JRA that was prepared by BEIS and the CER focused on the ability of the UK and Ireland to meet:

- the Infrastructure Standard (Article 6); and
- the Supply Standard (Article 8).

Additionally, the JRA identified and assessed common risks between the UK and Ireland that could impact on gas security of supply. This section provides a summary of the main findings contained within the JRA.

3.1 Infrastructure Standard

Under a regional approach, the JRA confirmed that Ireland can meet the N-1 Infrastructure Standard by adopting a regional approach with the UK. The results of the N-1 calculations presented in the JRA, on a national and regional level, are provided in Table 3.1. On a regional basis the N-1 is the loss of the Felindre Pipeline (which is the single largest infrastructure of common interest).

Table 3.1: UK & Ireland Regional N-1 (2016/17)[6]

Article 6 Infrastructure Standard - N-1 Calculations for UK & Ireland						
N-1 Formula	$N-1[\%]=\frac{EPm+Pm+Sm+LNGm+\mathrm{Im}}{D\max}x100$					
N-1 [%]	= (EPm + Pm + Sm + LNGm - Im x 100) / Dmax					
				Ireland's N-1	**UK's N-1**	**Regional N-1 for UK & Ireland**
				mscm/d	**mscm/d**	**mscm/d**
EPm	E	Technical Capacity of Entry Points		**25.92**	253.00	253.00
Pm	P	Maximal Technical Production Capability		**7.45**	114.00	121.45
Sm	S	Maximal Technical Storage Deliverability		0	156.00	156.00
LNGm	L	Maximal Technical LNG Facility Capacity		0	145.00	145.00
Im	I	Technical Capacity of Largest Gas Infrastructure		25.92	86.00	86.00
Dmax		Total Daily Demand of the calculated area		26.69	414.00	440.69
		during a day of exceptionally high gas demand (1 in 20)				
N-1%	=			28%	141%	134%

[6] Supply and demand values from National Grid's (UK) Gone Green scenario and Gas Networks Irelands (Ireland) Median scenario were used when calculating this N-1.

3.2 Supply Standard

Under Article 8 (Supply Standard) of the Regulation, Competent Authorities shall require that the natural gas undertakings[7] take measures to ensure gas supply to the protected customers in the following cases:[8]

> (a) extreme temperatures during a 7-day peak period occurring with a statistical probability of once in 20 years;
>
> (b) any period of at least 30 days of exceptionally high gas demand, occurring with a statistical probability of once in 20 years, and;
>
> (c) for a period of at least 30 days in case of the disruption of the single largest gas infrastructure under average winter conditions.

The JRA confirmed that both the UK and Ireland are able to fulfil the supply standard on a national basis as well as being able to fulfil the supply standard on a regional basis. Additionally, the JRA confirmed that the obligations imposed on NGUs in the UK and Ireland do not differ under a regional approach.

3.3 Gas Supply Disruption Scenarios

The JRA considered various disruption scenarios including loss of infrastructure that is of relevance to the UK and Ireland including the Felindre Pipeline, the Moffat Entry Point, and other key infrastructure downstream of Moffat.

In the event of infrastructure failure downstream of Moffat, the JRA considered the impact on linepack utilisation if a regional approach is applied between the UK and Ireland. This involved assessing how much of Ireland's linepack could be allocated to Northern Ireland from GNI's gas infrastructure (i.e. IC2 and SWSOS), and the impact of adopting a regional approach has on Ireland's gas security of supply.

The analysis noted that fulfilling the Infrastructure Standard on a regional basis does not imply that there will be sufficient infrastructure to deliver gas to all gas customers in the UK and Ireland at all times. Specifically, the failure of gas system components (i.e. at Moffat Entry Point or downstream of Moffat in Scotland) can potentially have significant

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[7] Natural Gas Undertaking defined in Directive 2009/73/EC means: "a natural or legal person carrying out at least one of the following functions: production, transmission, distribution, supply, purchase or storage of natural gas, including LNG, which is responsible for the commercial, technical and/or maintenance tasks related to those functions, but shall not include final customers."

[8] Appendix 2 outlines the UK and Ireland's definition of protected customers.

impacts for Ireland, Northern Ireland and Isle of Man in terms of gas security of supply, while gas supplies to GB could remain unaffected.

4 Preventive Measures

From the outset, it should be noted that the UK and Ireland have an established relationship in relation to co-operation on gas security of supply issues. This is reflected in the alignment of the gas TSO's gas emergency plans, and the development of a joint protocol between NGG and GNI in the event of load shedding. Specifically, these protocols address the scenarios of a:

- network gas supply emergency in GB;[9] and
- gas emergencies downstream of Moffat (e.g. emergency on SWSOS, ICs, SNIP and SNP), which can affect gas supplies to Ireland, Northern Ireland and the Isle of Man.

Additionally, the UK & Ireland Emergency Planning Group has been established to address gas security of supply issues affecting both the UK and Ireland: The group comprises three Government Departments (BEIS, DCCAE and DfE), the three regulators (OFGEM, CER and UREGNI), and the gas and electricity TSOs. Meetings take place every six months. As part of its work, the group applies a regional approach to risk analysis, preventive measures and emergency response. This includes the development of protocols between the gas TSOs to link emergency plans of each jurisdiction. Emergency exercises are also carried out by the TSOs in GB, Northern Ireland and Ireland on an annual basis and plans are refined on the basis of the learnings from the exercises. Additionally, the forum is used to discuss the implementation of the Regulation and the plans and assessments carried out by each jurisdiction in compliance with the Regulation.

With reference to the improvement of gas security of supply, the UK and Ireland Competent Authorities are considering initiatives such as potential security upgrades at key points within the UK's and Ireland's gas systems. Additionally, the development of Projects of Common Interest (see Table 4.1) have the potential to enhance security of gas supply in the UK and Ireland.[10]

[9] In the context of a gas supply emergency in GB that could affect the availability of gas to the Moffat interconnection point, it is agreed that a principal of proportionality be applied. Therefore, in a NGSE in GB, any reduction of flows through the Moffat interconnection point will be proportionate with actions being enacted on the GB network (unless specific geographical circumstances occur which require proportionally higher or lower load reduction in the north of GB).

Table 4.1 – UK-Ireland Projects Granted PCI Status

Project Code	Project Title	Project Promoter
5.1:	Cluster to allow bidirectional flows from Northern Ireland to Great Britain and Ireland and also from Ireland to United Kingdom including the following PCIs: **5.1.1.** Physical reverse flow at Moffat interconnection point	Gas Networks Ireland (formerly Gaslink)
	5.1.2. Upgrade of the SNIP (Scotland to Northern Ireland) pipeline to accommodate physical reverse flow between Ballylumford and Twynholm	Premier Transmission Limited
	5.1.3. Development of the Islandmagee Underground Gas Storage (UGS) facility at Larne	Islandmagee Storage Limited
5.3	Shannon LNG Terminal located between Tarbert and Ballylongford	Shannon LNG

To date, the CER has inputted into the EU Commission's PCI review process by providing assessments of projects' feasibility, maturity and impact where relevant to Ireland. The process in determining the PCI list for the two-year period 2018-2019 has commenced.

5 Regional Emergency Planning

As demonstrated in the 2014 and 2016 UK and Ireland Joint Risk Assessments, the existing regional cooperation between the UK and Ireland is mature, and this philosophy is embedded into existing emergency protocols (e.g. NGG and BGE Joint Protocol for Load Shedding). Additionally, regular all party emergency planning stakeholder meetings are held through the UK Ireland Emergency Group forum, which facilitates the alignment of emergency plans, TSO to TSO dialogue and annual emergency planning exercises.

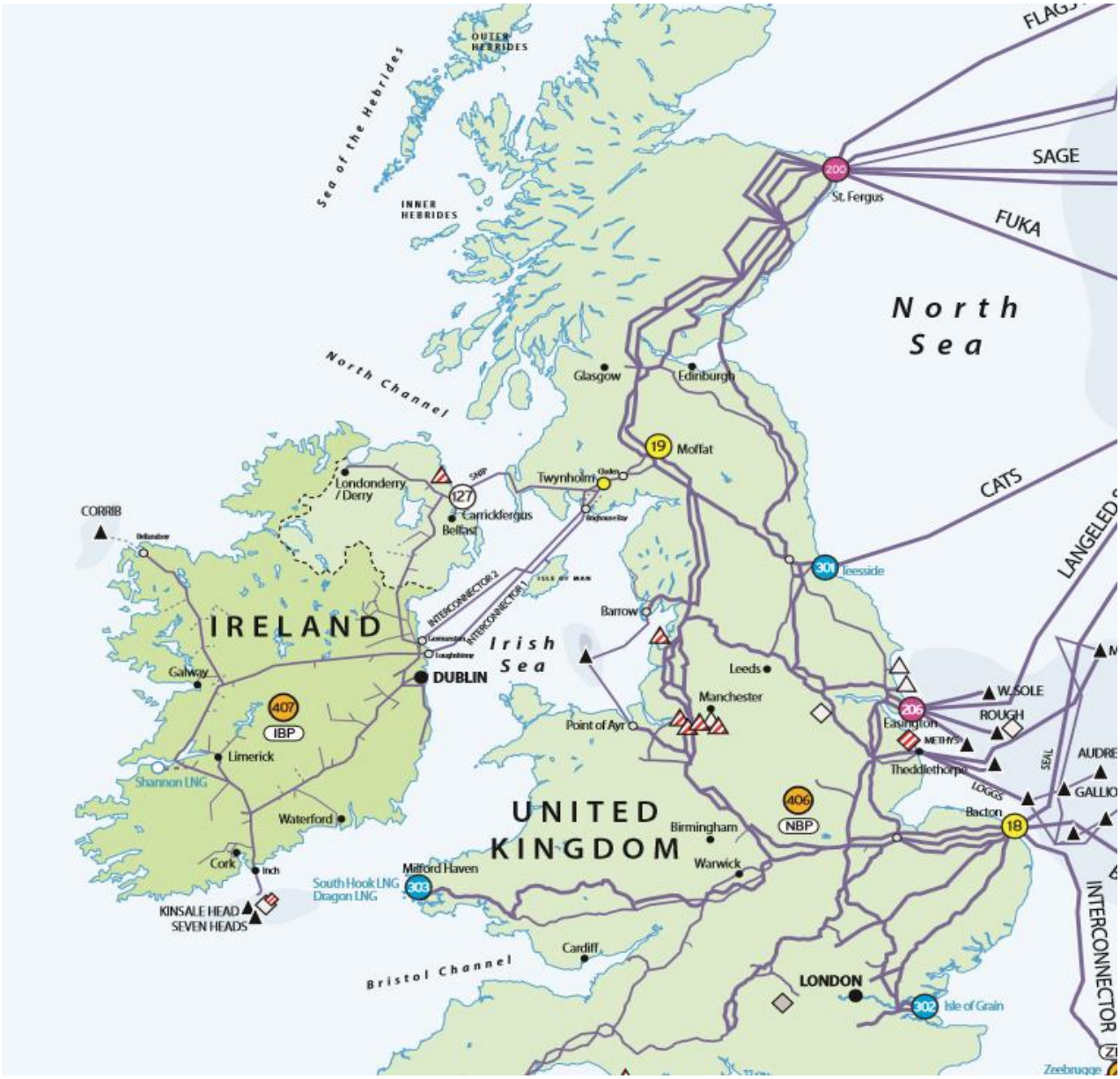
Consequently, it has been collectively agreed that the existing emergency plans and more detailed established operational protocols (which exist outside of the EU Framework) are satisfactory, and that a JEP is not currently required. However, given the dynamic nature of the gas market, the UK and Irish Competent Authorities will consider how future market developments may impact on emergency arrangements, and identify what amendments/additions to emergency arrangements should be put in place to address changes in the gas market. Such amendments/additions will be progressed through the UK Ireland Emergency Group forum.

6 Next Steps

The Competent Authorities in the UK and Ireland will continue to monitor and examine measures that may enhance gas security of supply on a regional basis.

Finally, the UK and Ireland's Competent Authorities note the Regulation is currently under review and any changes to the Regulation will be taken into account in the future.

Appendix 1: Map of UK and Ireland's Gas Infrastructure



Source: ENTSOG

Appendix 2: Definition of Protected Customers

GB's Definition of Protected Customer	Ireland's Definition of Protected Customer	Northern Ireland's Definition of Protected Customer
UK 'protected customers' gas volumes are split into the following definitions as per the Regulation: • Household customers; • Small and medium-sized enterprises connected to a gas distribution network; and • Essential social services where loss of gas supplies could endanger health (as long as these customers and small and medium sized enterprises do not exceed 20% of final use of gas) Protected Demand includes all loads up to 5860MWh non-daily metered (including residential and small business consumers), non-daily metered demand in Ireland, and priority load.	All NDM sector customers whose annual demand is below 5,550 MWh per annum. In addition, priority customers in the DM sector whose annual demand is between 5,550 MWh and 57,500 MWh per annum and are in the following categories: • Hospitals and Nursing Homes including retirement homes • High Security Prisons; and • District Heating Schemes and further categories of essential social services as determined by the CER from time to time.	All domestic customers, and small and medium industrial and commercial customers whose annual gas demand is below 25,000 therms/732MWh per annum.

Glossary of Terms and Abbreviations

Abbreviation or Term	Definition or Meaning
CER	Commission for Energy Regulation
DCCAE	Department of Communications, Climate Action and Environment
BEIS	Department of Business Energy and Industrial Strategy
DfE	Department for the Economy
DCS	Distribution Control System
GB	Great Britain
GNI	Gas Networks Ireland
JRA	Joint Risks Assessment
JPAP	Joint Preventive Action Plan
JEP	Joint Emergency Plan
LDM	Large Daily Metered
LNG	Liquefied Natural Gas
Mscm/d	Million Standard Cubic Meters daily
NEP	National Emergency Plan
NGET	National Grid Electricity Transmission
NGG	National Grid Gas
NGU	Natural Gas Undertaking
NRA	National Risk Assessment
NTS	National Transmission System
PCI	Project of Common Interest
PTL	Premier Transmission Limited
SNIP	Scotland to Northern Ireland Pipeline
SNP	South North Pipeline
SWSOS	South West Scotland Onshore System
TSO	Transmission System Operator
UK	United Kingdom