



## Key Messages

- Gas supplies from Great Britain (GB) via the Moffat Entry Point will continue to meet over 90% of annual Republic of Ireland (ROI) demand and, therefore, the Irish security of supply outlook is largely dependent upon the GB security of supply outlook. The balance of supply will be met from indigenous production and storage in the Celtic Sea.
- National Grid (UK) indicates in their Winter Outlook 2011/12 that there will be sufficient supply to meet all demand in both an average winter and a severe 1-in-20 winter.
- The ROI onshore transmission system and subsea Interconnectors have sufficient capacity to meet anticipated demand requirements in winter 2011/12 for all conditions evaluated.
- The South West Scotland Onshore System (SWSOS) is likely to approach its capacity limits in the event of severe weather and peak gas demand in winter 2011/12.
- The amount of system flexibility afforded to shippers at the Moffat Entry Point may be limited, subject to the levels of gas flows through the SWSOS.
- The outlook for ROI is that both gas supplies and network capacity will be sufficient to meet the anticipated demand over the winter period, subject to flow profiles at the Moffat Entry Point.

## Overview

This winter outlook report sets out Gaslink's analysis for the coming winter. The ROI's security of supply position is dependent on both the supply of gas and the system's ability to transport the gas to the end user.

In 2010/11, GB imports via the Moffat Entry Point met approximately 93.5% and 87.1% of ROI annual and peak day gas demand respectively, with the balance of supply being met by Celtic

Sea production and storage via the Inch Entry Point.

The majority of ROI gas demand will continue to be met by GB imports through Moffat until Corrib commences commercial production (expected in 2014). Corrib is anticipated to meet on average ~66% and ~37% of annual and peak day gas demand in its first three full years of operation.

A number of other potential supply projects discussed in the Network

Development Statement 2010/11 and the Joint Gas Capacity Statement (JGCS) 2011 would further enhance the ROI's security of supply.

In the short to medium term, it will be very challenging to meet peak day gas flow requirements with the existing onshore Scotland infrastructure. The peak day flows anticipated for the Moffat Entry point approach capacity limits for the next two winters and may potentially breach capacity limits in 2013/14.

## Winter Period 2010/11

A prolonged severe weather period in the 4 weeks preceding Christmas 2010 resulted in 17 days of demand which were above 90% of the ROI peak day demand. This period is shown in Figure 1. Peak daily gas demand was slightly short of the 7th of January 2010 peak daily demand record.

The Bord Gáis system peak throughput of 30.4 mscmd occurred on 8th December 2010. The system total includes for ROI, Northern Ireland (NI) and Isle of Man (IOM) flows, of 23.3 mscmd, 6.7 mscmd and 0.4 mscmd respectively.

Although no major incidents were encountered on the transmission and distribution systems, operation of the onshore Scotland system proved to be a significant challenge on the 8th of December. This was due to the record flows through the Moffat Entry Point combined with the 'within day' flow profiling (renominations). However, favourable pressure conditions at Moffat on the day ensured all flow requirements were met.

The electricity system recorded its peak demand on 21st December 2010. Gas demand for the power generation sector was lower than the 7th January 2010 peak due to gas power station outages. This was despite very low wind levels and favourable gas prices relative to coal for electricity generation. These outages were due to technical issues associated with the severe cold spell.

## Great Britain Outlook 2011/12

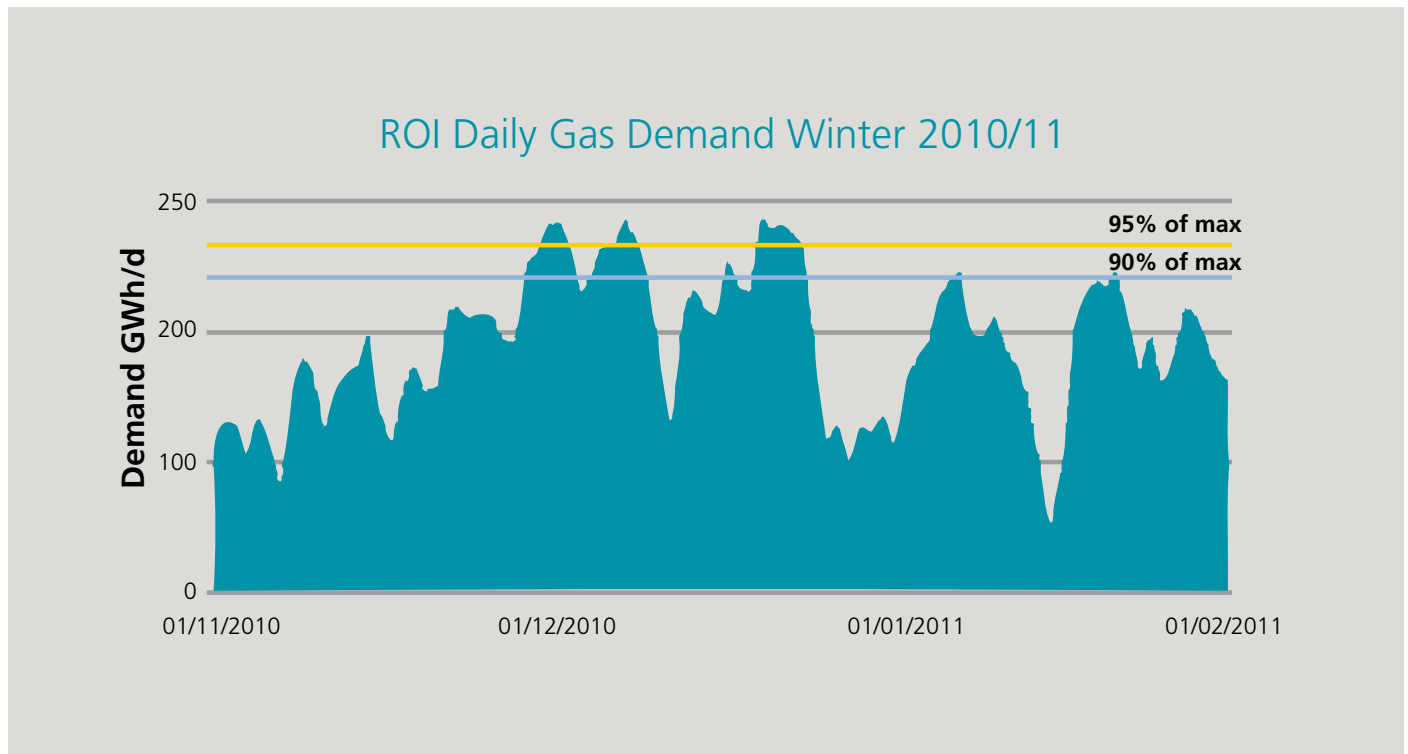
National Grid Winter Outlook anticipates that all demand could be met for all conditions evaluated.

The 2011/12 winter demand forecast is slightly lower than the 2010/11 weather corrected demand.

The National Grid Winter Outlook noted:

- Increased gas supplies from LNG and storage; and
- A reduction in UK Continental Shelf (CS) production forecast due to field decline, the ending of various swing contracts and delay in commissioning new fields.

Figure 1: 2010/11 Severe Weather Period





## Technical Capacity of the Moffat Entry Point

The technical capacity of the Moffat Entry Point is determined by the technical capacity of the infrastructure between Moffat and the ROI onshore transmission system, i.e. Beattock compressor station, the onshore Scotland transmission system, Brighthouse Bay compressor station, the subsea Interconnectors (ICs) and the pressure reduction stations at Gormanston and Loughshinny (See Figure 2).

Currently the capacity of the Moffat Entry Point is limited by the technical capacity of Beattock compressor station.

- The station's design capacity is 26.0 mscmd, however actual flows of ~27.2 mscmd were recorded in December 2010.
- Extensive desktop studies have enhanced Bord Gáis Networks ability to predict the behaviour of the station above the peak flows previously observed.
- The challenge is to optimise the compressor station's power in order to meet both flow and downstream pressure requirements, while ensuring its operational integrity.
- The maximum theoretical capacity of the station was stated as 32 mscmd in the JGCS 2011, subject to operating in 'series mode', i.e. achieve high discharge pressure.

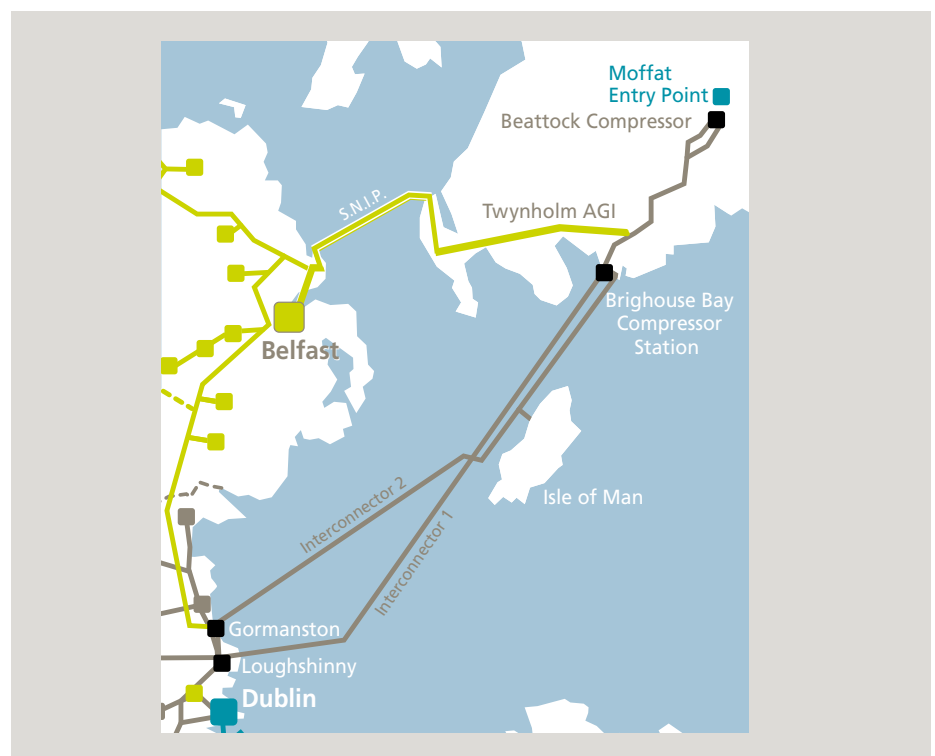
- However, under such high flow conditions the compressor station is better suited to operating in parallel mode, i.e. achieve higher flows, but lower discharge pressure.
- The maximum theoretical capacity of the station has been determined as 31 mscmd<sup>1</sup>, subject to operating in 'parallel mode'.
- The station cannot provide the maximum discharge pressure of 85 barg under such high flow conditions, and consequently there are implications downstream of Beattock;
  - Lower prevailing pressures at Twynholm, but above the contractual entitlement<sup>2</sup>; and
  - The amount of system flexibility that is available to accommodate within day renominations.

- The pressure from the GB National Transmission System (NTS) influences both the station's capacity (in volumetric terms) and the station's discharge pressure. The station's capacity may be influenced by the Gross Calorific Value (GCV) of the gas at Moffat.

<sup>1</sup> <http://www.gaslink.ie/index.jsp?p=136&n=205>

<sup>2</sup> A minimum pressure of 56 barg is the contractual entitlement at Twynholm (upstream).

**Figure 2: Interconnector System including Scotland, Subsea and ROI**





## Forecasted 1-in-50 Peak Day Demand for Winter 2011/12

This table details both the 1-in-50<sup>3</sup> peak day demand by jurisdiction; ROI, NI and IOM, and supply by entry point; Moffat and Inch, published in the Joint Gas Capacity Statement (JGCS) 2011.

The JGCS 2011 demand forecasts assumed the Moyle electricity interconnector would be available this winter. In the event the Moyle Interconnector is unavailable (fully or partially) on the peak day, there may be an increase to the above peak day demand forecasts.

However, Mutual Energy Ltd. (MEL) have recently advised that the latest Northern Ireland (NI) peak day demand forecast for this winter is approximately 7.1 mscmd. This figure is ~0.8 mscmd lower than the JGCS 2011 NI peak demand forecast. This downward adjustment may offset any gas demand increase on the JGCS 2011 peak day 2011/12 forecast, which may result from the Moyle interconnector being unavailable.

Table 1: JGCS 2011 Peak Day Flows

Demand	1-in-50 Peak Day (mscmd)
ROI	24.5
NI	8.0
IOM	0.6
Total	33.1
Supply	1-in-50 Peak Day (mscmd)
Inch	3.0
Moffat	30.1
Total	33.1

## Operational Challenges for Winter 2011/12

In the event that 1-in-50 peak day demand occurs this winter, it is likely the capacity limits of the Moffat Entry Point will be approached and consequently there will be limited scope for within day shipper renominations at Moffat. The flow profile will need to be flattened and predictable; therefore, shippers at the Moffat Entry Point are advised to;

- Ensure D-1 nominations/renominations are as accurate as possible;
- Provide renominations in a timely and accurate manner in compliance with contractual arrangements; and
- Operate in accordance with the flow nomination information they have provided to the Transmission System Operator (TSO).

In addition to 1-in-50 peak day demand, there are a number of other factors which could potentially impact on the capacity and/or system flexibility at the Moffat Entry Point;

- Lower pressures available from the GB NTS at Moffat – implies lower station capacity and/or station discharge pressure.

- Current technical capacity (31 mscmd) is based on an Anticipated Normal Offtake Pressure (ANOP) of 47 barg<sup>4</sup>. However, pressure levels breached the ANOP on a number of occasions last winter.
- Within day pressure variations also impact on compressor station operations. The frequency and magnitude of pressure variations has increased in recent years, as a result of a change in demand/supply patterns in the GB NTS.
- A variation in the Gross Calorific Value (GCV) of gas at Moffat may impact on the capacity of Beattock compressor station.
- Current technical capacity (31 mscmd) is based on a GCV of 39.8 MJ/scm<sup>5</sup>. However, a lower GCV of ~39.0 MJ/scm was observed for a number of weeks in 2011.

<sup>3</sup> Gas demand under weather conditions, statistically likely to occur once every 50 years.

<sup>4</sup> As advised by National Grid.

<sup>5</sup> Validated by actual GCV observations at the Moffat.

## Security of Supply - Interconnector Linepack

Subsea Interconnector pressures will be maintained to ensure minimum operational requirements and sufficient linepack to meet approximately two days of non-power generation demand, in the event of a supply disruption.

At times of peak demand, such a stock position (high linepack in subsea ICs) may need to be reduced in order to free up transportation capacity, thereby ensuring end of day volumes are met.

## Commercial Arrangements

The Code Modification Forum is currently reviewing the existing commercial arrangements regarding renominations at the Moffat Entry Point.

In addition, there may be a number of other services/products impacted this winter should peak demand occur:

- Gaslink's position regarding the application of the Implied Nomination Flow Rates (INFR) mechanism is currently under review.
- The probability of interruption to the Interconnector Inventory product will increase if peak demand occurs.

