

Winter Outlook 2018/19



Key Messages

- Gas Networks Ireland (GNI) in setting out the demand outlook for the winter period ahead (Winter 2018/19) presents both the Republic of Ireland (ROI) gas demand and the GNI system demand. The GNI system demand refers to the total demand transported through the GNI system, i.e. the combined demands for ROI, Northern Ireland (NI) and Isle of Man (IOM);
- The Corrib gas field is expected to meet approximately 40% of Gas Networks Ireland system demand in 2018/19;
- Gas supplies from Great Britain (GB) via the Moffat Entry Point are expected to account for approximately 57% of the Gas Networks Ireland system demand in 2018/19 with the balance of 3% met from Inch production;
- The outlook for ROI indicates sufficient gas supplies and network capacity to meet the anticipated demands over the coming winter period;
- In the case of a 1-in-50 winter peak day, Moffat would be expected to account for 78% of GNI system demand, with Corrib and Inch contributing 20% and 2% respectively;
- The gas demand forecast for the forthcoming winter is as per the Gas Networks Ireland Network Development Plan 2018, with further sensitivities considered to account for potential forced outages in the power generation sector;
- Gas shippers are advised to ensure that D-1 nominations are as accurate as possible and to provide re-nominations in a timely and accurate manner so that the gas network is operated in an effective and efficient manner;
- During early 2018, the gas network demonstrated resilience through the extreme weather event, storm Emma, with no loss of gas supply to households, businesses or the power generation sector.

Key Terms

- In setting out gas demand forecast and historic quantities, this document refers to **Republic of Ireland gas demand and Gas Networks Ireland system demand**¹.

¹ Gas Networks Ireland system demand refers to the combined demands for ROI, NI and IOM

Overview

As part of the Winter Outlook, GNI reviews the ROI and system demands and supplies from the previous year. This review is outlined in the **Actual 2017/18 Gas Supplies** section below. The Winter Outlook report also sets out Gas Networks Ireland's analysis and views of the adequacy of the gas network for the coming winter. The gas supply position is dependent on both the supply of gas and the system's ability to transport the gas to the end user. This analysis is outlined in the **Forecast 2018/19 Gas Supplies** section below.

The Corrib gas field commenced production in December 2015 and began operating at full capacity in July 2016. This led to a change in the ROI supply position and to gas interconnector flows. Following a period operating at full capacity, a production plateau was reached at the beginning of 2018. A steady decline in production has been observed at Corrib commencing in January 2018, in line with supply profile projections as detailed in the Network Development Plan 2018. Corrib operated at a level of c. 82% of peak production capacity in October 2018. Corrib is anticipated to be flowing at c. 79% of its peak capacity over the coming winter period.

PSE Kinsale Energy Limited has advised Gas Networks Ireland that storage operations have ceased, and blowdown of Southwest Kinsale cushion gas will progress. There will be no further injections into Southwest Kinsale. Production gas is currently being supplied from the Inch Entry Point and is anticipated to continue for winter 2018/19, and onwards until production ceases completely, currently anticipated in 2019/20.

The Integrated Single Electricity Market (I-SEM) went live on the 1st October 2018. The Gas Networks Ireland transmission system continues to supply gas to flexible gas-fired power generation, with gas contributing an average of c. 50% of the all-island power generation fuel mix for the month of October 2018². Ahead of the launch of I-SEM, Gas Networks Ireland completed a hydraulic modelling assessment on the potential impact on the gas transmission network. A number of potential stressed power sector gas demand scenarios were developed and tested in the model. In all scenarios, the capability of the gas network to cater for the stressed demand scenarios was proven.

Actual 2017/18 Gas Supplies

In 2017/18, indigenous gas supply sources met 63% of **ROI annual gas demand** (Corrib met 57% of ROI demand, and Inch met 6%). Imports from GB through the Moffat Entry Point accounted for the balance of 37%.

Indigenous gas supply sources met 49% of GNI **annual system demand** (44% from Corrib and 5% from Inch). Imports from GB through the Moffat Entry Point accounted for the balance of 51%.

Moffat accounted for 50% of ROI gas supply sources to meet the **ROI peak day gas demand**, with Corrib accounting for 45% and Inch contributing the balance of 5%.

Moffat, Corrib and Inch accounted for 61%, 35% and 4% respectively of GNI **system peak day gas demand**.

Forecast 2018/19 Gas Supplies

The Corrib gas field is expected to meet approximately 53% of **ROI annual gas demand** in 2018/19. Gas supplies from Great Britain (GB) via the Moffat Entry Point are expected to account for circa 43% of ROI annual gas demand in 2018/19 with 4% met from Inch production.

Moffat, Corrib and Inch are anticipated to account for 57%, 40% and 3% respectively of Gas Networks Ireland **annual system demand** in 2018/19.

In the case of a **1-in-50³ ROI winter peak day**, Moffat would be expected to account for 70% of ROI gas demand, with Corrib and Inch contributing 28% and 2% respectively.

As a portion of the Gas Networks Ireland system demand, Moffat, Corrib and Inch are anticipated to account for 78%, 20% and 2% respectively in the event of a **1-in-50 system winter peak day**.

Figure 1: Actual 2017/18 Supplies

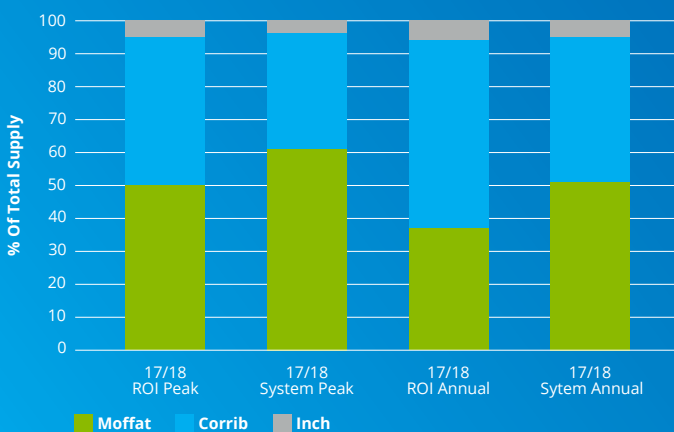
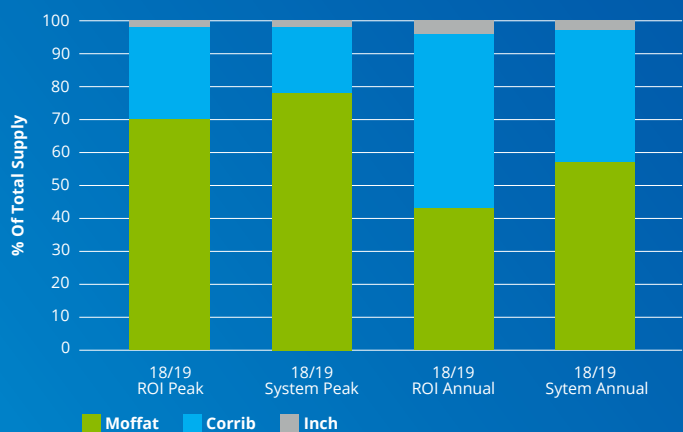


Figure 2: Forecast 2018/19 Supplies



² EirGrid Smart Grid Dashboard

³ Gas demand under weather conditions, statistically likely to occur once every 50 years



Winter Period 2017/18

The extreme winter weather experienced in 2017/18 resulted in a significant increase in residential gas demand compared to the previous winter. The 2017/18 winter period was approximately 13% colder than the previous winter period, based on a Degree Day (DD) comparison. Winter 2017/18 residential gas demand increased by 15% on the previous winter period. This increase was driven primarily by the colder temperatures. Notably, the weather corrected residential gas demand increase on the previous winter was 5.9%, which demonstrates a portion of the residential sector growth being attributed to strong economic growth (and growth in new connections).

Coinciding with storm Emma, the coldest day in winter 2017/18 occurred on the 1st of March 2018, with an average temperature of -2.8°C; the equivalent day in 2016/17 occurred in late January 2017 with an average temperature of -0.25°C.

This severe cold spell in early March 2018 resulted in a 1-in-50 year peak day demand in the NDM⁴ sector on the 1st March 2018. However the overall demand on this day was not an overall peak day for winter 2017/18 as strong winds reduced gas demand in the power generation sector. The ROI peak day gas demand for winter 2017/18 occurred on the 5th of March 2018 with a peak day demand of 20.3 mscmd. The average temperature on the 5th of March 2018 was 3.3°C. The 5th March 2018 was also the peak day for Gas Networks Ireland system demand. Total GNI system throughput was 26.1 mscmd. This figure includes for flows to ROI, Northern Ireland (NI) and Isle of Man (IOM) of 20.3 mscmd, 5.4 mscmd and 0.4 mscmd respectively.

In the Industrial & Commercial sector, strong economic growth (and growth in new connections) has driven up gas demand in this sector by 5.8% over the previous winter period.

In the power generation sector a reduction in gas demand of 7% below the previous winter period, was driven by continuously changing dynamics in the sector. The primary driver for this reduction is the fact that the previous winter (2016/17) was an exceptionally high period for power generation sector gas demand. The above reduction of 7% follows an equivalent 15.1% increase the previous winter. Aside from economic trends, multiple factors have an influence on gas demand in the power generation sector, among them: Prevailing market conditions on the SEM⁵ and its UK equivalent BETTA⁶ directly influence flow direction (IE-UK or UK-IE) on the EWIC⁷; The level of installed wind generation capacity in Ireland and Northern Ireland increased by 20% in 2017, while the average wind generation capacity factor was lower in 2017 compared to 2016 (26%)⁸; levels of wind generation constraint and curtailment can impact the demand for gas-fired power generation as do electricity interconnector and generator outages.

⁴ Non-Daily Metered customers consume less than 5.55GWh of gas annually. This category covers all residential properties, as well as small industrial and commercial consumers, connected to the distribution network.

⁵ Single Electricity Market

⁶ British Electricity Trading and Transmission Arrangements

⁷ East West Interconnector

⁸ EirGrid Annual Renewable Energy Constraint and Curtailment Report 2017

Great Britain National Grid Outlook

National Grid UK predict sufficient gas availability from a variety of supply sources to meet GB winter 2018/19 demand. Supplies from the UK Continental Shelf and from Norway are expected to be high, similar to last year. The new Aasta Hansteen field upon commencing production will add 23 mscmd to Norwegian production.

Gas demand in GB for winter 2018/19 is expected to be slightly lower than experienced in winter 2017/18. The gas demand forecast for winter 2018/19 is 46.6 bcm, and the 1-in-20 peak day demand is forecast at 472 mscmd. The main driver for the lower gas demand arises in the power generation sector, due to increased renewable generation and coal replacing gas in the electricity generation merit order for some or all of the winter as a result of higher gas prices.

Storage, Liquefied Natural Gas (LNG) and interconnectors are important components in the GB supply mix, providing flexibility to the market. National Grid UK expect the cycling of gas into and out of storage to continue, similar to the patterns observed last year.

Average flows from IUK gas interconnector are expected to be lower this winter due to the expiry of long term contracts. As a result, gas deliveries to the UK via the BBL interconnector may be price sensitive.

Global LNG demand is rising as fast as supply, and LNG delivery remains difficult to predict. High demand and high prices have drawn LNG away from the European markets to the Asian markets, especially China. Unless prices change, National Grid UK expect this situation to continue, and therefore are not expecting LNG output to be high on many days this winter.

Forecasted peak day demands for Winter 2018/19

Table 1 presents the 1-in-50 year and average year peak day system demand forecasts for 2018/19 in line with the Network Development Plan 2018. The forecast indicates that for a 1-in-50 peak day, Moffat flows would be above 90% of its technical capacity⁹. An average year peak day would require 71% of the available capacity at Moffat to meet GNI system demand.

Table 1: Projected Gas Demand for Winter 2018/19

	1-in-50 Peak day (mscmd)	Average Winter Peak day (mscmd)	Annual Total (bcm)	Winter Total (bcm)
ROI Demand	27.2	23.3	5.1	2.8
GNI System Demand*	37.0	30.6	6.7	3.6
Inch Supply	0.7	0.7	0.2	0.2
Corrib Supply	7.8	7.8	2.8	1.7
Biogas Supply	< 0.1	< 0.1	< 0.01	< 0.01
Moffat Supply	28.5	22.1	3.7	1.8
Total Supply	37.0	30.6	6.7	3.7

* Winter total refers to the aggregate forecast demand / supply for the period between 1st of October 2018 and 31st of March 2019

Gas Networks Ireland notes ongoing outages of power generation units leading into the winter period, most significantly Great Island (gas-fired CCGT) unit GI4 and Moneypoint (coal-fired) units MP1, MP2, MP3. Current status at the time of the Winter Outlook data freeze, is for the units in question to return to service in the first half of the winter period¹⁰. Gas Networks Ireland carried out a sensitivity analysis on the forecast peak day gas demands for winter 2018/19 to incorporate a scenario whereby some or all of the above units do not return to service for the peak day:

- Sensitivity 1: Peak Day outage at Great Island (GI4) and Moneypoint (MP1, MP2, MP3)
- Sensitivity 2: Peak Day outage at Moneypoint only (MP1, MP2, MP3)

Both sensitivity scenarios resulted in an increase in gas demand in the power generation sector, in comparison to the base case. In Sensitivity 1, the increased demand in the power generation sector resulted in a 5.7% increase in ROI gas demand, and a 4.2% in GNI system gas demand. Sensitivity 2 resulted 6.7% increase in ROI gas demand, and 4.9% in GNI system gas demand.

The increased gas demand in both of the above scenarios remain within the capacity of the Moffat Entry Point and on the GNI system as a whole to maintain gas supplies in the event of a 1-in-50 year peak day.

⁹ The Moffat Entry Point currently has a technical capacity of 31 mscmd. This is set to increase by c. 10% following completion of the twinning of the South West Scotland Onshore System.

¹⁰ EirGrid All Island Outage Plan Week 43 (2018) – Week 6 (2019)

Operational challenges for Winter 2018/19

GNI's operational challenges for Winter 2018/19 remain consistent with those of 2017/18. Ideally the Transporter strives to maintain flat, steady flow profiles at each of the Entry Points where possible, and to minimise variations in network pressures. Network configuration and physical limitations, coupled with late nomination/re-nomination behaviour can prevent this from always being the case. Some within day variations in network pressures are expected to continue as a result of within day volatility in supply and demand patterns.

Shipper actions that aid the Transporter in this regard include the following:

- Ensure D-1 nominations/re-nominations are as accurate as possible;
- Avoid large within day imbalances where possible;
- Provide re-nominations in a timely and accurate manner in compliance with contractual arrangements; and
- Operate in accordance with the flow nomination information Shippers have provided to the TSO.

In addition to the occurrence of 1-in-50 winter peak day demands, there are a number of other factors which need to be considered with regard to system flexibility:

- Within day pressure volatility at Moffat on the GB National Transmission System (NTS) also impacts on compressor station operations. The frequency and magnitude of such volatility has increased in recent years, as a result of a change in demand/supply patterns in the GB NTS.
- Gas with a lower Gross Calorific Value (GCV) at Moffat means higher volumes are required to meet downstream energy requirements.
 - Current technical capacity (31 mscmd) is based on a GCV of 39.8 MJ/scm¹¹.
 - The average GCV at Moffat over the Winter 2017/18 was c. 38.6MJ/m³, typically ranging between 38.0 MJ/scm and 39.4 MJ/scm during winter 2017/18.

¹¹ Validated by actual GCV observations at the Moffat Entry Point



Commercial Arrangements

GNI continues to observe a pattern of Shippers re-nominating their Moffat Entry requirements late in the day, leading to the inefficient use of the Compressor fleet in Scotland. Ongoing engagement between GNI and Shippers has helped to highlight the issue and whilst some improvements are being observed, there is not yet a consistent pattern to suggest the issue has been resolved satisfactorily.

This engagement included GNI proposing “within day balancing requirements” to commercially incentivise to re-nominate more frequently during the day. Following this proposal by GNI a marked improvement in the timing of nominations occurred initially, but nomination behaviour then subsequently deteriorated again.

Much of the fluctuation in intra-day flows has been ascribed by Shippers to variations in Power Generation demand from day to day and also within day. The “go-live” of the I-SEM project on the 1st of October 2018 means that power generation shippers are now operating in a new commercial environment which has the potential to introduce increased variation on their instructed demand from EirGrid. It remains to be seen how this will translate into re-nominations to GNI on the gas side but early indications suggest that gas shippers are being more cautious with their Entry Nominations, with supplies complemented by sourcing gas via the Irish Balancing Point (IBP) trading platform which has shown a shift in trading patterns to later in the day during October.

Gas Networks Ireland continues to engage with industry on developing an appropriate solution(s) to this issue in the context of general discussions around balancing arrangements on the network.

GNI will, if required, formally proceed to introduce a modification to the Code of Operations to “introduce within day balancing requirements”.

Storm Emma - Gas Network Response

Following lessons learnt in 2010, GNI anticipated the oncoming effects of storm Emma and implemented a core response team on standby in four-wheel drive vehicles. In advance and during the weather event, field staff carried out checks to ensure the backup generators at installations were topped up to ensure continuity of the gas supply. During storm Emma, domestic demand was the highest ever recorded but there were no pressure or gas supply issues on the distribution network.