Gas Networks Ireland

Winter Outlook 2021/22

Key messages

- Gas Networks Ireland in setting out the demand outlook for winter 2021/22 (September 2021 to March 2022) presents both the Republic of Ireland (ROI) gas demand and the Gas Networks Ireland system demand. The Gas Networks Ireland system demand refers to the total demand transported through the Gas Networks Ireland system, i.e. the combined demands for ROI, Northern Ireland (NI) and Isle of Man (IOM).
- The Corrib gas field is anticipated to meet 27% of ROI demand, and 21% of Gas Networks Ireland system demand in gas year 2021/22 (October 2021 to September 2022).
- Gas supplies from Great Britain (GB) via the Moffat Entry Point are expected to account for the balance of gas supply requirements in gas year 2021/22; 73% of ROI demand and 79% of the Gas Networks Ireland system demand will be met by Moffat.
- The outlook for ROI indicates sufficient gas supply sources and network capacity to meet the anticipated demand projections over the coming winter period including in the case of the 1-in-50 winter peak day.
- In the event of a 1-in-50 winter peak day, Moffat is anticipated to account for 87% of Gas Networks Ireland system demand, with Corrib providing the remaining 13%.
- The Gas Networks Ireland system peak day gas demand forecast for the forthcoming winter is 33.1 mscm/d in the case of severe winter peak day, and 30.3 mscm/d in the case of an average winter peak day. Further sensitivity scenarios have been considered in the event that forced outages should occur 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 manner so that the gas network is operated efficiently.
- The effects of the COVID-19 pandemic and the associated restrictions on commercial and societal activity saw an overall decrease in ROI gas demand of 1% in winter 2020/21 below winter 2019/20. The effect was most apparent within the Industrial and Commercial sector that saw a reduction of 3.3% year-on-year.
- In the context of Brexit, there has been no negative impact on gas imports from GB as a result of the UK's exit from the European Union in January 2021 and future disruptions to gas supply from the Moffat Entry Point are not anticipated.

Overview

This Winter Outlook report sets out Gas Networks Ireland's analysis and view of the adequacy of the gas network for the coming winter. The gas supply position is dependent on both the supply of gas and on the system's ability to transport gas to the end user.

With the Kinsale gas field having ceased production of commercial gas in July 2020, Corrib and renewable gas are the remaining indigenous gas sources. The share of renewable gas in the network is set to grow over the coming years following the commissioning of the first renewable gas Entry Point on the network in May 2020.

The Corrib gas field, following commencement of production in December 2015 and a subsequent period operating at full capacity, reached a production plateau at the beginning of 2018. A steady decline in production has been observed at Corrib since January 2018, in line with supply profile projections as provided by the operators of the Corrib gas field. Corrib operated at a level of c. 46.5% of full production capacity when averaged over the gas year 2020/21.

Given the decline in indigenous gas supply from Corrib, imports from GB through the Moffat Entry Point continue to be the dominant supply source and provide the balance of gas supply after Corrib and biomethane.

Actual 2020/21 supplies

In 2020/21 indigenous gas supply sources met 29% of **ROI annual gas demand**. Imports from GB through the Moffat Entry Point accounted for the balance of 71%.

Indigenous gas supply sources met 22% of **annual Gas Networks Ireland system demand** while Imports from GB through the Moffat Entry Point accounted for the balance of 78%.

Corrib accounted for 21% of the ROI gas supply sources that met the 2020/21 **ROI peak day gas demand**, with Moffat contributing the balance of 79%.

Corrib and Moffat accounted for 16% and 84% respectively of **Gas Networks Ireland system peak day gas demand in 2020/21**.

Forecast 2021/22 gas supplies

The Corrib gas field is expected to meet approximately 27% of **ROI gas demand** in 2021/22. Having reached a production plateau in early 2018, Corrib is anticipated to be flowing at up to c. 45% of its full daily capacity over the coming winter period. The Gross Calorific Value of Corrib gas is consistently 37.7 MJ/scm. With production at Kinsale gas field having ceased in July 2020, Corrib and biomethane are the two remaining indigenous gas supply sources. Biomethane injection to the gas grid is in its infancy, currently providing low levels of gas to the network. Biomethane is expected to grow to a larger share of indigenous supply in the future.

Gas supplies from GB via the Moffat Entry Point are expected to account for the balance of supplies, after Corrib and biomethane, to meet 73% of **ROI gas demand** in 2021/22.

Corrib and Moffat are anticipated to account for 21% and 79% respectively of **Gas Networks Ireland system demand** in 2021/22.

In the case of a 1-in-50[1] **winter peak day**, Corrib is anticipated to account for 18% of **ROI gas demand**, with Moffat contributing 82%.

Corrib and Moffat are anticipated to account for 13% and 87% respectively of the **Gas Networks Ireland system demand** in the event of a **1-in-50 winter peak day**.

Figure 1: Actual 2020/21 supplies

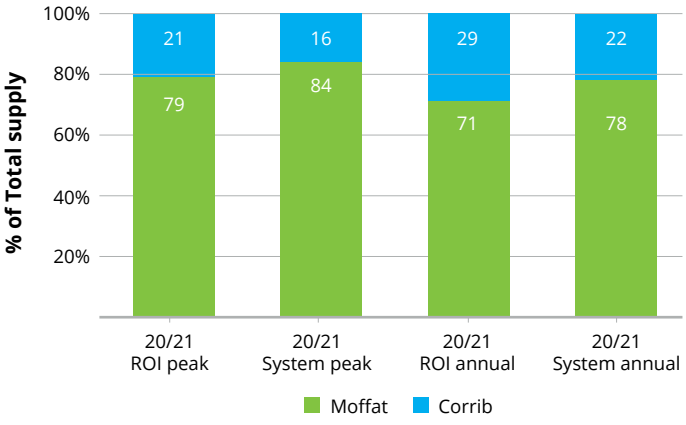
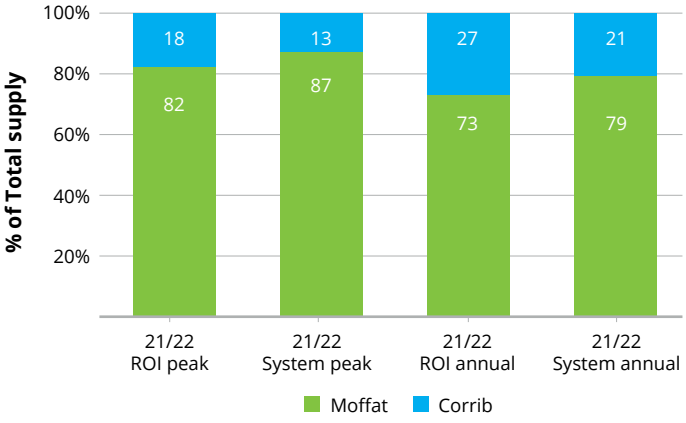
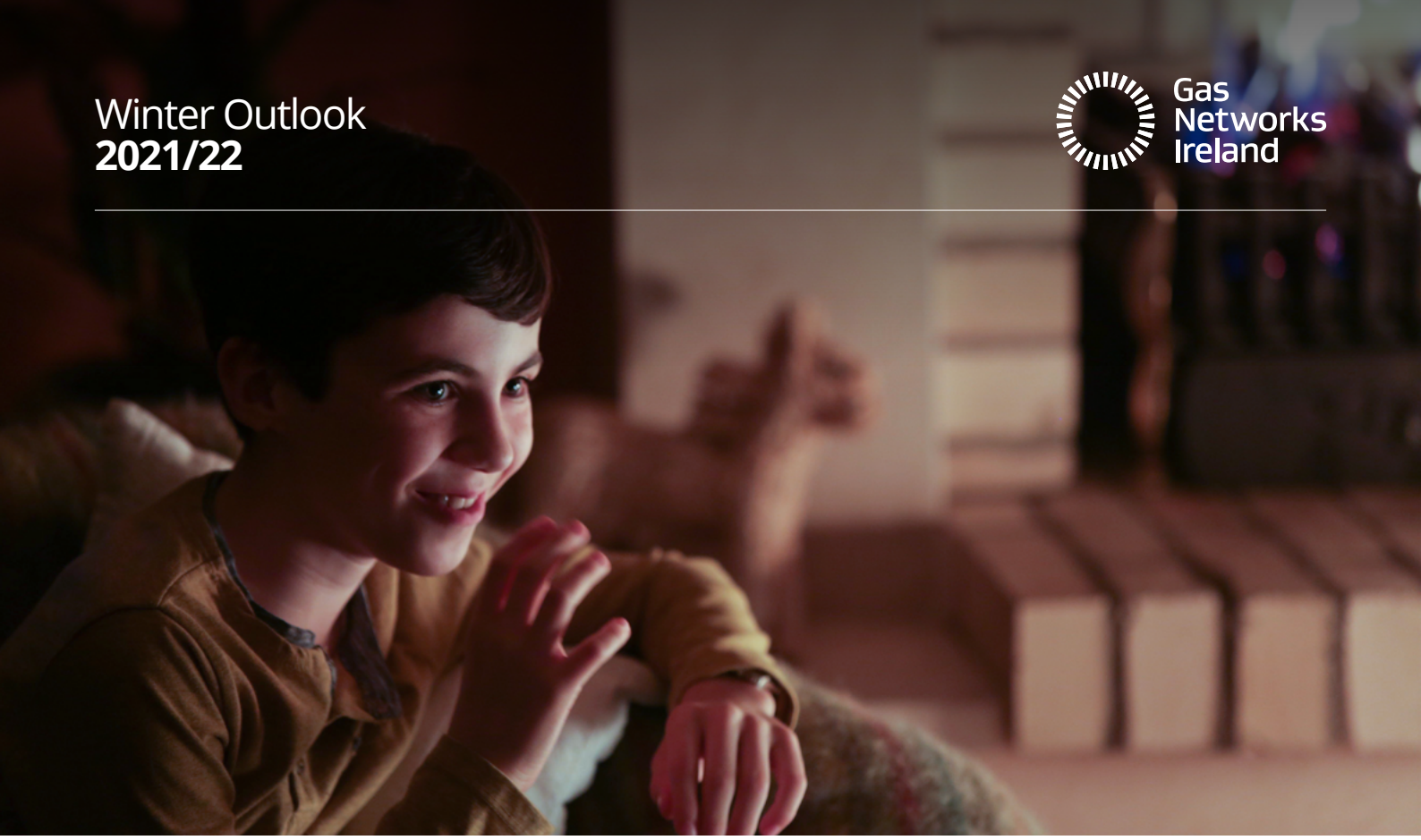


Figure 2: Forecast 2021/22 supplies



1 Gas demand under weather conditions that are statistically likely to occur once every 50 years.



Winter period 2020/21

The winter period 2020/21 saw a slight decrease in Residential gas demand of 0.7% compared to the previous winter. The 2020/21 winter period was slightly warmer (0.4%) than the previous winter period based on a Degree Day (DD) comparison. Hence, the weather corrected Residential gas demand for winter 2020/21 showed a marginal increase (0.1%) when compared to the previous winter period.

In the Industrial and Commercial sector, gas demand decreased by 3.3% below the previous winter period. This can be directly attributed to the impact of COVID-19 related restrictions on the economy, given that the restrictions were first introduced in March 2020.

In the Power Generation sector, gas demand was broadly in line with the previous winter; a marginal 0.2% increase was observed. This followed a similar increase of 0.3% in winter 2019/20 over the 2018/19 winter period.

Wind powered generation for winter 2020/21 reduced by 1% in comparison to the previous winter, while the installed all-island wind generation capacity increased in the interim period[2] suggesting that average wind speeds were lower in winter 2020/21 than the previous winter.

The Gas Networks Ireland transmission system continues to supply gas to flexible gas-fired power generation on the Single Electricity Market (SEM). Gas contributed an average of 43% of Ireland's power generation fuel mix during the winter 2020/21 period. Over gas year 2020/21, gas accounted for 47% of the fuel mix; gas typically contributes a higher portion of the fuel mix during the summer months due to the likelihood of lower wind generation compared to the winter. On days of low wind, gas has contributed to almost 87% of the generation fuel mix.

The ROI peak day gas demand for winter 2020/21 occurred on the 8th January 2021 with a peak day demand of 22.8 mscm/d. The average temperature on the 8th January 2021 was -0.15 °C. On this peak day, Power Generation accounted for 54% of demand with Industrial and Commercial accounting for 24% and Residential accounting for 22%. Gas-fired power generation accounted for 58% of the SEM fuel mix on this day, with wind generation accounting for 22%. It is notable that wind generation was not particularly low on the peak day. However, electricity interconnectors operated as net exporters of electricity to GB, which when combined with comparatively high electricity demand in ROI, drove very high demand for gas-fired power generation.

January 8th 2021 was also the peak day for Gas Networks Ireland system demand. Total Gas Networks Ireland system throughput on the peak day was 30.2 mscm/d. This figure includes flows to ROI, NI and IOM of 22.8 mscm/d, 6.9 mscm/d and 0.5 mscm/d respectively.

The coldest day in winter 2020/21 occurred on the 9th January 2021, with an average temperature of -1.35 °C; the equivalent day in 2019/20 occurred on the 5th March 2020, with an average temperature of 1.8 °C.

ROI and Gas Networks Ireland system - forecasted peak day demands for Winter 2021/22

Table 1 presents the 1-in-50 and average peak day system demand forecasts for 2020/21. The Winter Outlook projections take into account the sharp increase in fuel prices that occurred in the second half of the summer 2020/21, i.e. July to September 2021.

Gas supply forecasts for winter 2021/22 indicate that for a 1-in-50 peak day, Moffat flows would be at c. 82% of its technical capacity[3]. An average winter peak day would require 74% of the available capacity at Moffat to meet Gas Networks Ireland system demand.

Table 1: Projected gas demand for Winter 2021/22

	1-in-50 Winter peak day (mscm/d)	Average Winter peak day (mscm/d)	Annual total gas year 2021/22 (bcm)	Winter total[4] (bcm)
ROI demand	23.2	22.0	5.4	2.9
Gas Networks Ireland system demand[5]	33.1	30.3	7.1	3.8
Corrib supply	4.4	4.4	1.5	0.8
Biogas supply	0.01	0.01	<0.01	<0.01
Gas Networks Ireland system Moffat supply	28.7	25.8	5.5	3.1
ROI Moffat supply	18.8	17.5	3.9	2.2

In order to stress the peak day gas demand requirement, Gas Networks Ireland carried out a sensitivity analysis on the forecast peak day gas demands for winter 2021/22 to incorporate two notional scenarios as follows:

- sensitivity 1: outage at Moneypoint (1 coal-fired unit out of service) on the peak day;
- sensitivity 2: outage at Moneypoint (3 coal-fired units out of service) on the peak day.)

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 1.3% increase in Gas Networks Ireland system gas demand and a 1.8% increase in ROI gas demand. Sensitivity 2 resulted in a 5% increase in Gas Networks Ireland system gas demand and a 7.1% increase in ROI gas demand.

The increased gas demand in both scenarios remain within the capacity of the Moffat Entry Point and of the Gas Networks Ireland system capacity in the event of a 1-in-50 winter peak day.

National grid UK Winter outlook - Great Britain (GB)

National Grid UK predict sufficient gas availability from a variety of supply sources to meet GB winter 2021/22 demand. Supplies from the UK Continental Shelf and from Norway are expected to be the main sources of supply, with Norway having the potential to export greater volumes of gas to GB in 2021/22 compared to the previous two winters.

Storage, Liquified Natural Gas (LNG) and interconnectors are important components in the GB gas supply mix, providing flexibility to the market. LNG is a global market with supply to the GB market affected by international prices. If low LNG volumes are delivered to GB this winter, European interconnection and domestic storage will make up the shortfall in gas demand. The projected starting level of gas in GB storage at the start of winter 2021/22 is within the range of the previous four winters, recovering quickly from the low stock level in August 2021.

National Grid UK do not anticipate any disruption to gas supplies as a result of the UK's exit from the European Union. Gas demand in GB for winter 2021/22 is expected to be comparable to winter 2020/21 and National Grid UK do not expect any significant operational challenges resulting from the effects of the COVID-19 pandemic.

The margin between forecast peak supply capacity and demand for winter 2021/22 is 104 mscm/d. Under N-1 conditions, i.e. an event resulting in the loss of the single largest piece of National Transmission System (NTS) infrastructure, the supply margin at peak day demand is 32 mscm/d.

3 Moffat Entry Point has a technical capacity of 35 mscm/d
4 Winter total refers to the aggregate forecast demand / supply for the period between 1st of October 2021 and 31st of March 2022
5 The Gas Networks Ireland system demand refers to the total demand transported through the Gas Networks Ireland system, i.e. the combined demands for ROI, Northern Ireland (NI) and Isle of Man (IOM)

COVID-19 Response

There has been no resulting negative impact on the operation of the gas network due to COVID-19. Throughout the COVID-19 pandemic, Gas Networks Ireland have and are continuing to implement the recommendations and guidelines from the HSE and Irish Government to minimise the spread of the COVID-19 virus, and are in frequent contact with relevant Government Departments to ensure that the Government is kept up to date on our activities.

The gas network has maintained security of supply to residences, businesses and power generation customers without interruption during this period. Gas Networks Ireland's Grid Control team in Cork is one of the business-critical teams working 24/7 to ensure that gas flows reliably and safely across our network, to meet our customers' gas requirements in homes, power generation stations and other essential businesses around the country.

Gas Networks Ireland initiated the use of its backup control centre at Midleton, Co. Cork at the beginning of the pandemic. This has allowed the Grid Control team to alternate day- and night-shift crews between the locations in Cork City and Midleton, thereby adhering to social distancing guidelines, with scheduled deep cleans of both locations performed between shifts. The use of the backup control centre has now ceased, but it continues to be maintained and is available for use should the need arise.

Operational challenges for Winter 2021/22

Gas Network Ireland's operational challenges for winter 2021/22 remain consistent with those of 2020/21. Ideally Gas Networks Ireland 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. Within day variation in network pressures is expected to continue as a result of volatility in supply and demand patterns.

Shipper actions that aid Gas Networks Ireland in this regard include:

- ensuring D-1 nominations/re-nominations are accurate;
- avoiding large within day imbalances where possible;
- providing re-nominations in a timely and accurate manner in compliance with contractual arrangements and;
- operating in accordance with the flow nomination information provided to the Transmission System Operator (TSO).

In addition to the occurrence of 1-in-50 winter peak day demands, there are several other factors which need to be considered regarding 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 of Moffat (35 mscm/d) is based on a GCV of 39.8 MJ/scm and;
- the average GCV at Moffat over the Winter 2020/21 was c. 39.3 MJ/scm, typically ranging between 38.9 MJ/scm and 40.2 MJ/scm[6].

 Validated by actual GCV observations at the Moffat Entry Point

Commercial arrangements

Gas Networks Ireland monitors transmission system imbalances as a result of shipper behaviour on a daily basis. Increasing liquidity on the Marex Spectron Trading Platform allows Gas Networks Ireland to trade out system wide imbalances in an efficient manner. Following enhancements to Gas Networks Ireland's Non Daily Metered (NDM) forecasting algorithm, combined with improved Shipper nomination accuracy, the amount and frequency of Gas Networks Ireland balancing actions has reduced since 2020.

The increased price of gas to date in 2021, and the associated 3.5% of the System Average Price that is levied as a penalty against the Shippers for imbalances, appears to be serving as an incentive to Shippers to appropriately balance their portfolios.

The previously highlighted issues of Shippers providing very late entry nominations to Gas Networks Ireland at Moffat, and its associated impact on the efficient running of the compressor stations, has improved. This improvement is attributable to improved Shipper behaviour following repeated highlighting of the issues by Gas Networks Ireland and is also due to a natural increase in flow requirements at Moffat as indigenous production at Corrib declines.