



Gas Transmission Winter Review and Consultation June 2023



Winter Review and Consultation 2023



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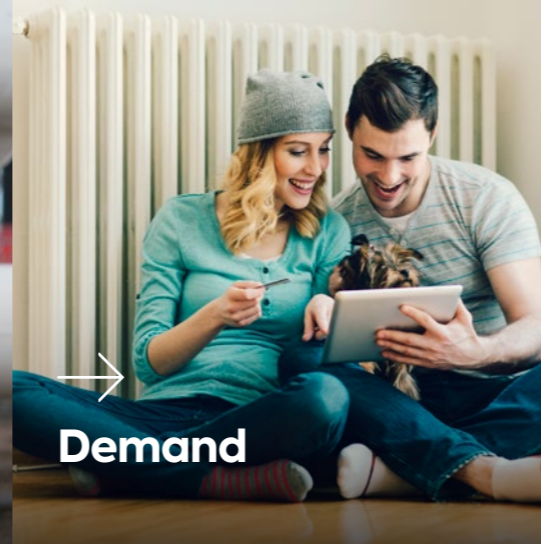
Glossary



Welcome



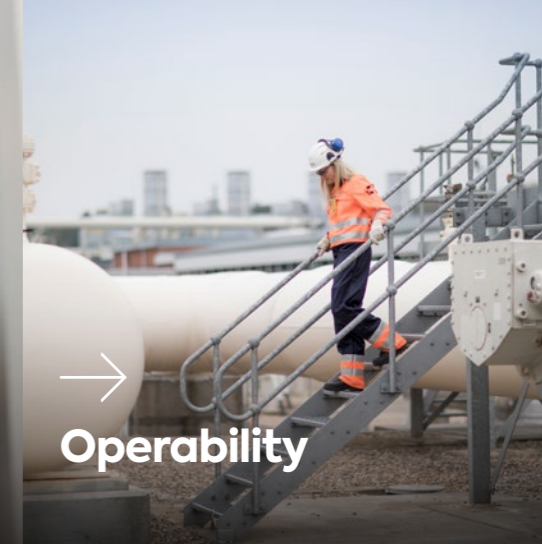
Executive summary



Demand



Supply



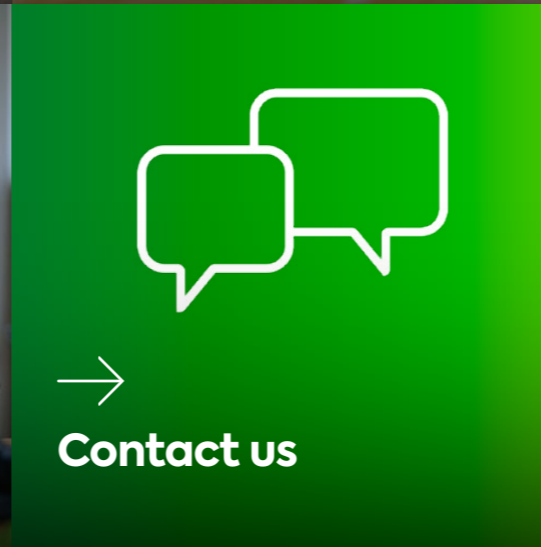
Operability



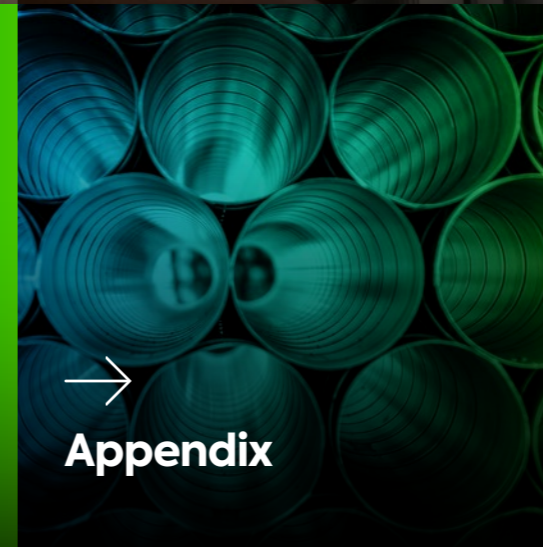
Cold snap spotlight



Looking ahead to winter 2023/24



Contact us



Appendix



Glossary



Welcome

How to use this document

We have published the Gas Winter Review and Consultation 2023 as an interactive document.



Home

This will take you to the home page.

Enlarge/reduce

Hover over the magnifying icon to make charts bigger or smaller.



Arrows

Click on the arrows to move backwards or forwards a page.

'Linked' content

Words in green and underlined have links to other pages in this document, or are URLs.

Welcome to our 2023 Gas Winter Review and Consultation



Earlier this year we separated from National Grid to form National Gas Transmission. We sit within the new National Gas company, which also owns National Gas Metering – you can find out more about us on our [website](#).

Whilst our name has changed, our role in transporting gas around Great Britain (GB) remains the same – it's business as usual. Gas remains an integral part of the GB energy system, underpinning GB energy security. Our network ensures millions of people can access the energy they need to heat their homes; powers British industry; and facilitates flexible electricity generation.

Each year we publish the Winter Review and Consultation, which looks back at gas supply and demand for the previous winter (October 2022 to March 2023). This year we're also sharing initial thoughts about the coming winter (2023/24) and asking for your views too – see more on the [consultation page](#).

Ahead of last winter, we saw unprecedented volatility in the global energy markets, largely due to the invasion of Ukraine by Russia and the resultant reduction in gas supplies to continental Europe. Given the level of uncertainties at play, we introduced scenarios in our most recent Winter Outlook publication to help provide further insight into what we could see in terms of supply and demand behaviours.

Throughout this publication we will share with you the actual supply and demand behaviours we observed over winter, comparing this with the scenarios and forecast information that we provided in the Winter Outlook. Some of our key observations are:

- 7.6 billion cubic metres (bcm) of gas was exported to Europe through our network over winter – the highest level ever and almost double that of the previous winter.
- GB received record levels of LNG deliveries (15.7 bcm compared with 11.4 bcm the previous year).
- We saw increased variability in daily demand for power – 9.4 million cubic metres per day (mcm/d) to 95.9 mcm/d, with 59 days where gas was responsible for at least 40% of all electricity generation in GB.

As with all of our publications, we really value your feedback – let us know what works, what doesn't, and how we could do things better for you. If you'd like to get in touch, you can find contact details towards the end of this document.

I hope this publication provides you with useful insight into what we saw in winter 2022/23 and our early thoughts about winter 2023/24, and I look forward to continuing to engage with you through our various publications and industry forums.



Ian Radley
Director, System Operations

Additional information about us

Other key National Gas Transmission publications:

- [Annual Network Capability Assessment Report \(ANCAR\)](#), published annually in June.
- [Gas Winter Outlook](#), published annually in October.
- [Gas Ten Year Statement \(GTYS\)](#), published annually in November.
- [Gas Future Operability Planning \(GFOP\)](#), published at the request of our stakeholders, with the most recent published in October 2021.

Our role

As the National Transmission System (NTS) Owner and Operator, we have three key responsibilities:

- infrastructure provider
- residual balancer
- market facilitator.

Our licence is established under the Gas Act 1986. It requires us to develop, maintain, and operate an economic, efficient network and to facilitate competition in the supply of gas in Great Britain. We have a responsibility to keep the NTS within safe operating limits.

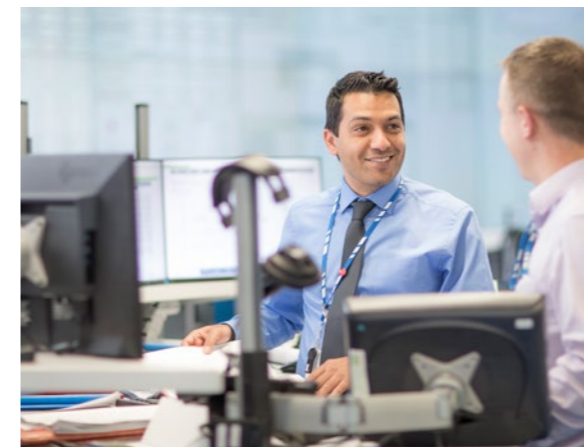
The underlying market arrangements in GB are predicated on the basis that the market will provide the gas itself, and that the market will balance supply and demand.

We don't assess or communicate gas margins during the summer period due to the significant reductions in demand, but throughout the winter period, we will continue to conduct daily assessments of gas margins and communicate this to the industry via our market information portal.

When there is an imbalance between supply and demand, we act as residual balancer by taking energy balancing actions via the On The Day Commodity Market (OCM). These actions are designed to encourage shippers who are out of balance to take action themselves and, if required, we can buy or sell volumes of gas to balance the system. Read more about the tools available to us in the event of a supply and demand imbalance on our [balancing website](#).



We have a responsibility to keep the National Transmission System (NTS) within safe operating limits.





Executive summary

[Demand summary](#)[Supply summary](#)

Demand summary

GB demand (excluding exports and storage injection) in winter 2022/23 was lower than last winter, however, total demand was slightly higher than last year given the high levels of exports. Some specific areas of demand showed different behaviour:

- After adjusting for weather, we observed a 13% reduction in residential (NDM) demand when compared to the previous year. This was largely due to price increases.
- We saw record levels of exports to Europe of 7.6 bcm, around double that of the previous winter (we also saw some imports on high demand days).
- Demand for power has become increasingly variable, with the highest range of daily power demands to date (9.4 mcm/d to 95.9 mcm/d), largely due to the intermittent nature of renewable generation.
- Storage was utilised frequently this winter, providing high supplies to the network during the cold spells and then re-filling.
- Cold snaps occurred at the same time as low wind, which meant that we saw Local Distribution Zone (LDZ) and power demand peak at the same time.

Winter 2022/23 included a demand day of 417 mcm, the highest we've seen since the 'Beast from the East' 5 years ago (read more about this in our [spotlight](#)).



Figure 1
Breakdown of daily gas demand

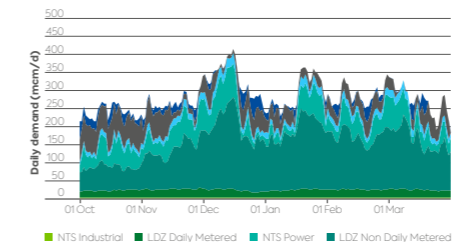


Table 1
Breakdown of gas demand in bcm – a version in TWh can be found in the appendix

Demand in bcm	Winter 2020/21		Winter 2021/22		Winter 2022/23		
	2020/21 actual demand	2020/21 weather corrected demand	2021/22 actual demand	2021/22 weather corrected demand	2022/23 forecast	2022/23 actual demand	2022/23 weather corrected demand
NDM	31.3	30.3	28.1	29.7	28.2	24.8	25.9
DM	4.5	4.4	4	4	3.8	3.8	3.8
Industrial					0.5	0.5	0.5
Power	11	11	10.1	10.1	12.3	9.3	9.3
GB total	49.8	48.7	45	46.6	44.3	38.4	39.5
Ireland	3	3	2.8	2.8	3.2	3	3
Interconnector export	0	0	3.7	3.7	4	7.6	7.6
Storage injection	1.6	1.6	1.3	1.3	1.4	2.5	2.5
Total demand	51.8	50.7	50.3	51.9	53.1	51.5	52.6

Supply summary

- Baseload supplies from the UK Continental Shelf (UKCS) were broadly in line with our expectations, with Norwegian Continental Shelf (NCS) supplies slightly lower than anticipated due to flows being favoured to Europe (due to a positive price differential in Europe).
- Flexible supplies predominantly came from high volumes of Liquefied Natural Gas (LNG) supported by GB storage.
- LNG supplies were at a record level, the highest we have seen during any winter to date.
- During the highest demand days we saw a low level of imports from Europe.



Figure 2

Breakdown of daily gas supply

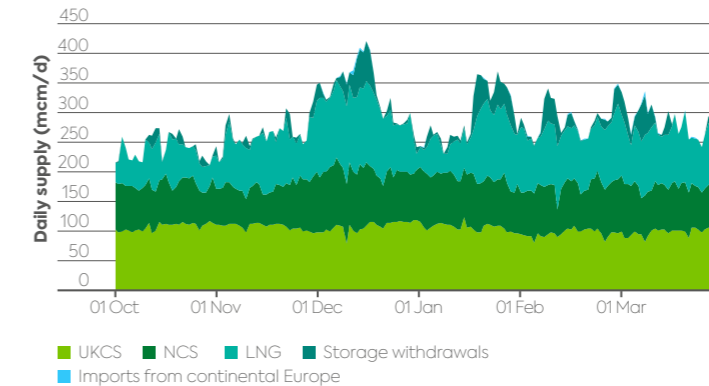


Table 2

Breakdown of gas supply – a version in TWh can be found in the appendix

Winter supply (bcm)			
Winter	2020/21 actual	2021/22 actual	2022/23 actual
UKCS	17.0	16.9	18.8
Norway	18.7	18.9	14.4
EU imports	4.8	0.5	0.06
LNG	8.9	11.4	15.7
Storage withdrawal	2.1	1.9	2.68
Grand total	51.5	49.6	51.7



Demand

[Introduction](#)

[Total LDZ offtake demand](#)

[LDZ daily metered demand](#)

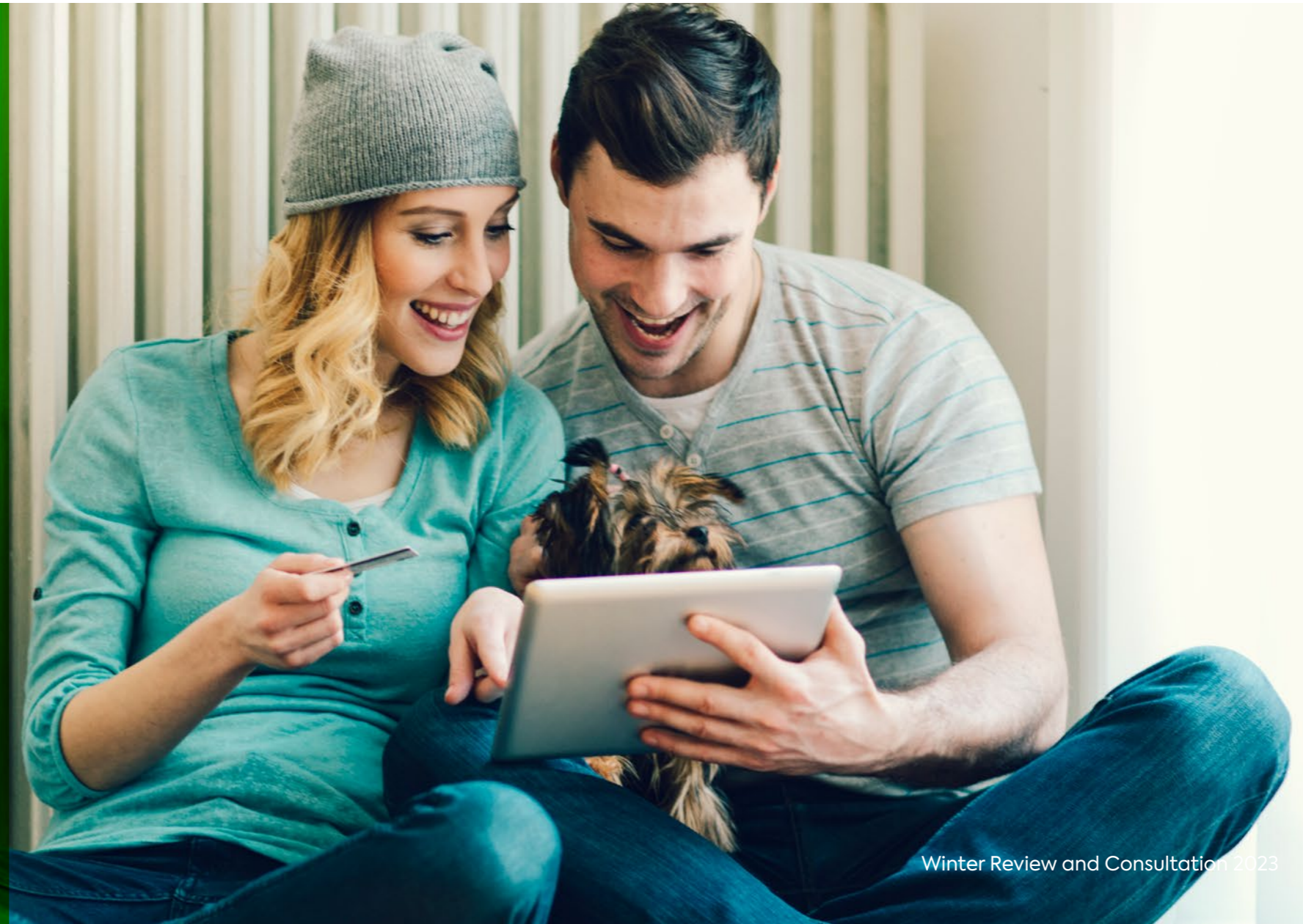
[LDZ non daily metered demand](#)

[NTS demand for power generation](#)

[NTS industrial demand](#)

[Exports to Ireland](#)

[Exports to continental Europe](#)



Introduction to demand and supply chapters

In this section we delve further into each demand and supply category individually.

Each page provides a summary of what we saw over winter and how it compared to both our forecast and the scenarios published in our Winter Outlook in October 2022. We'll also briefly cover how the events of winter 2022/23 have informed our view of what we might expect to see for the coming winter period.

For the supply and demand categories where we saw a significant change vs historical averages, or behaviour worthy of note, we provide a deeper dive to share additional context and insight that we hope will be of interest to you.



Please note:

We share more information on how we're preparing for winter 2023/24, along with our early plans for developing the winter 2023/24 scenarios, in the ['Looking ahead to winter'](#) chapter.



Total LDZ offtake demand (NDM & DM)

What did we expect?

– A reduction in demand of 4% (due to high prices) was built into our Winter Outlook forecast.

What did we see?

- After adjusting for weather, we observed a further 7% reduction in total LDZ demand when compared to the Winter Outlook forecast.
- We believe this has been caused by domestic consumers reducing their consumption due to high prices (demand suppression was still apparent during the cold snap in December).
- The expected demand reduction for businesses (DM) did not materialise.

What this could mean for winter 2023/24

– We expect LDZ demand to remain suppressed due to higher energy prices.

Figure 3
Daily LDZ offtake demand

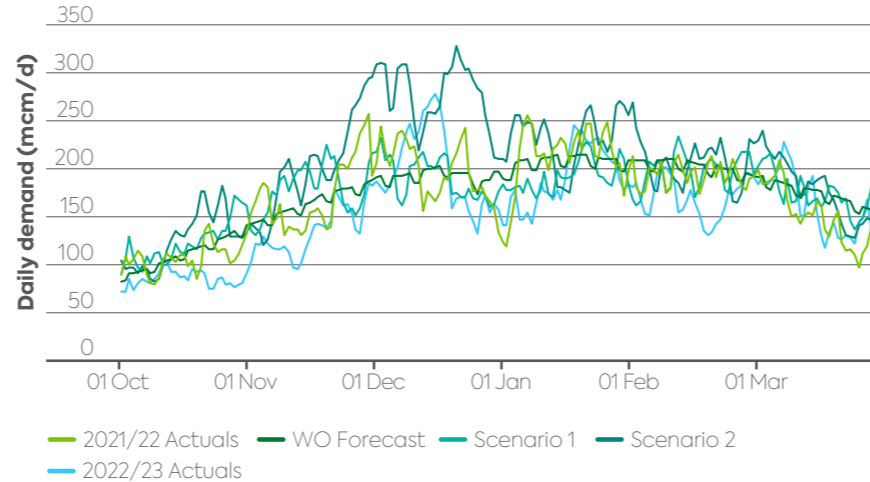
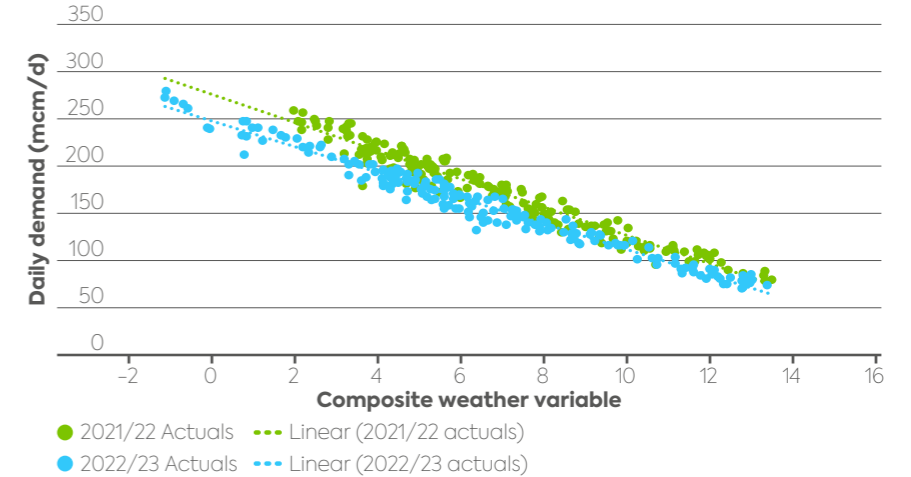


Figure 4
LDZ offtake scatter graph





LDZ daily metered demand

What did we expect?

– A reduction in demand of 8% (due to high prices) was built into our Winter Outlook forecast.

What did we see?

- The expected demand reduction did not materialise. Our initial thoughts are that longer duration fixed price contracts and government support schemes have helped to moderate the impact of higher prices.
- It could also be that businesses have less opportunity to flex their demand.
- DM demand this year was 4% lower than the previous winter

What this could mean for winter 2023/24

– There is no new intelligence to suggest any changes, we therefore expect daily metered demand to continue at similar levels to last winter.

Figure 5
Daily LDZ daily metered demand

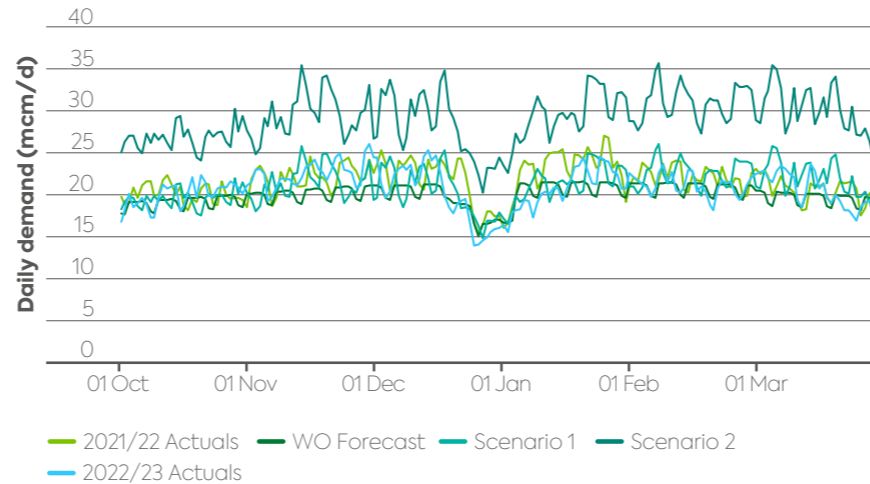
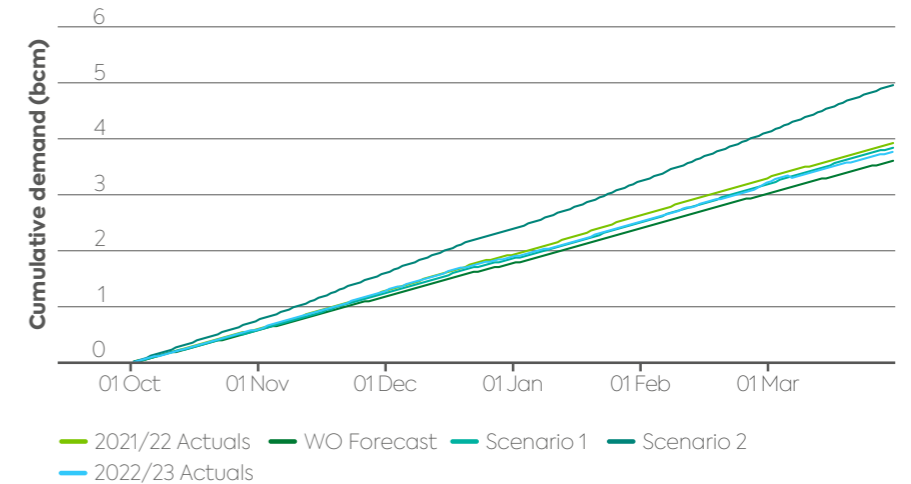


Figure 6
Daily LDZ metered YTD





LDZ non daily metered demand

What did we expect?

– A reduction in demand of 5% (due to high prices) was built into our Winter Outlook forecast.

What did we see?

– After adjusting for weather, we observed a further 8% reduction in demand, when compared to the Winter Outlook forecast.
 – NDM demand this year was 13% lower than the previous winter.
 – We believe this was caused by consumers changing behaviour due to high prices. This demand suppression was still apparent during the cold snap in December.

What this could mean for winter 2023/24

– We expect LDZ demand to remain suppressed.

Figure 7
LDZ non daily metered demand¹

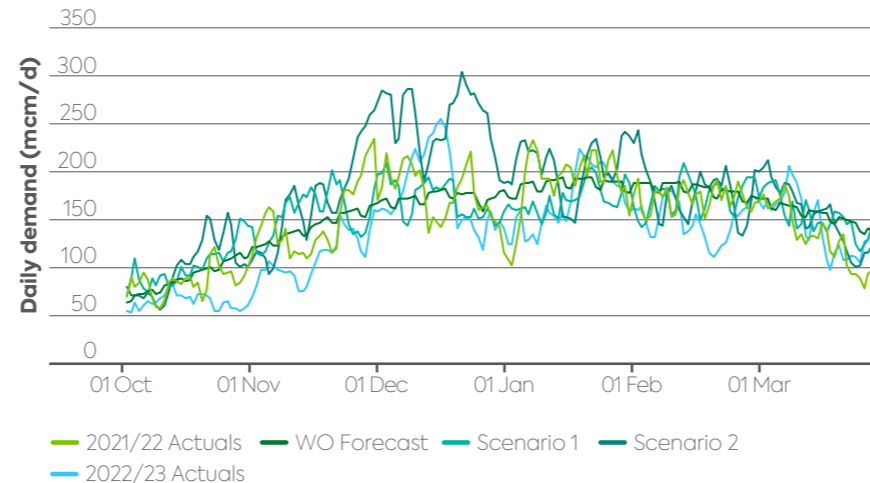
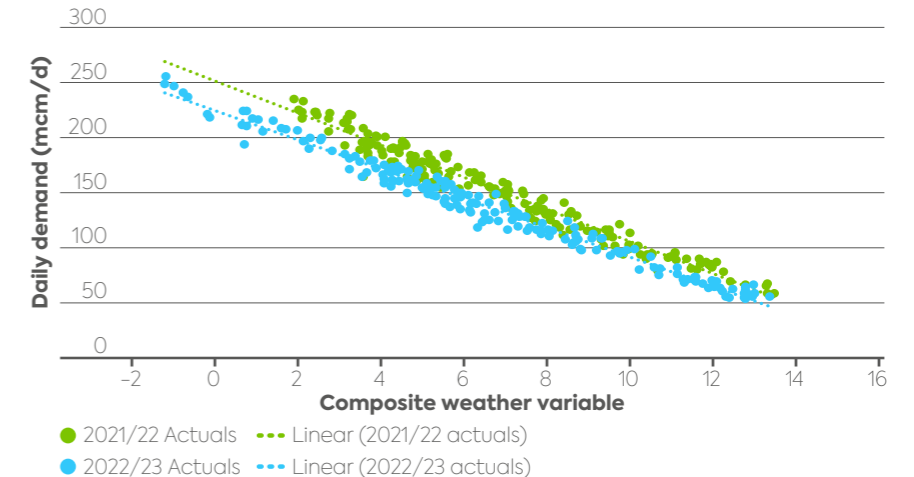


Figure 8
LDZ non daily metered demand scatter graph¹



¹ Non daily metered demand calculated as the difference between LDZ offtake demand and LDZ daily metered demand.



NTS demand for power generation

What did we expect?

– An increase in demand of 22%, due to elevated levels of electricity exports, was built into our Winter Outlook forecast.

What did we see?

- Demand was 25% lower than we forecast in our Winter Outlook, this was largely because the elevated levels of electricity exports did not materialise.
- Actual demand for 2022/23 was comparable to the previous winter.
- High volatility in daily demand, for example going from 90 mcm/d during the December cold snap to almost zero (see more about this on the next slide).

What this could mean for winter 2023/24

– We expect that the total demand will continue to decrease slightly as more renewables come online, but there will be an increase in variability on a day-to-day basis (we cover this in more detail on the next page).

Figure 9
Daily NTS demand for power generation

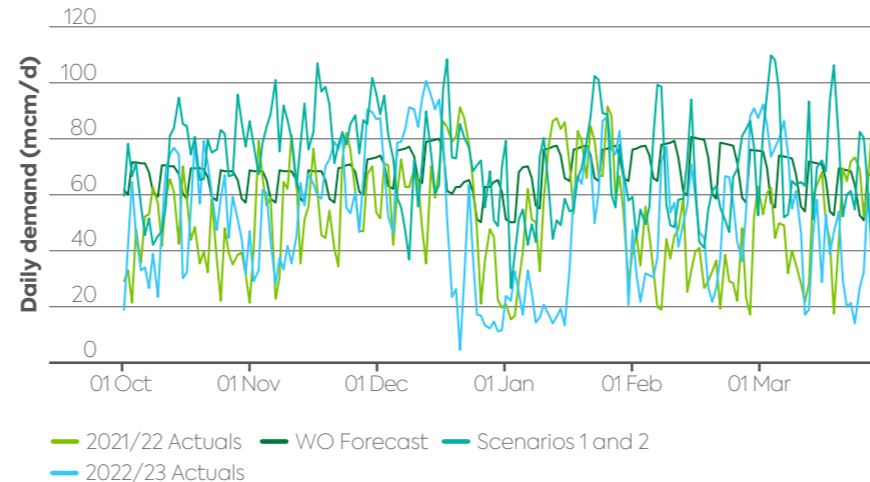
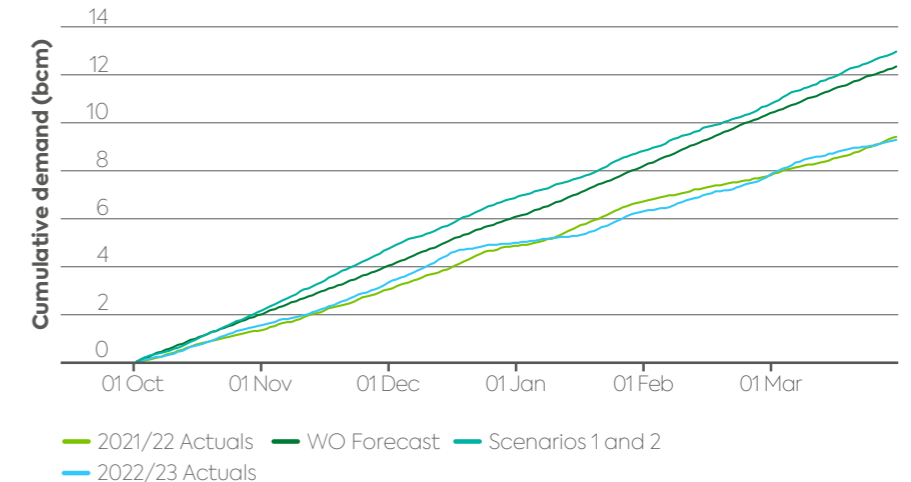


Figure 10
NTS demand power generation YTD



NTS demand for power generation Spotlight

Gas is a key source of energy for power generation in the absence of renewables e.g. if there is no wind, the power that would have been generated by wind turbines needs to be generated from another energy source, such as gas, to meet electricity demands.

As the use of renewable energy increases, we're finding that gas demand for power generation is increasing in both quantity and variability on a day-to-day basis – reflecting the way renewable energy generation can rapidly change in response to weather conditions.

Whilst total demand for power generation is slowly reducing year on year, as more renewable generation comes online we expect the day-to-day variability to increase as a consequence. Figure 11 shows that for winter 2022/23, the range of daily gas demand for power generation had increased, with daily demand ranging from 9.4 mcm/d to 95.9 mcm/d.

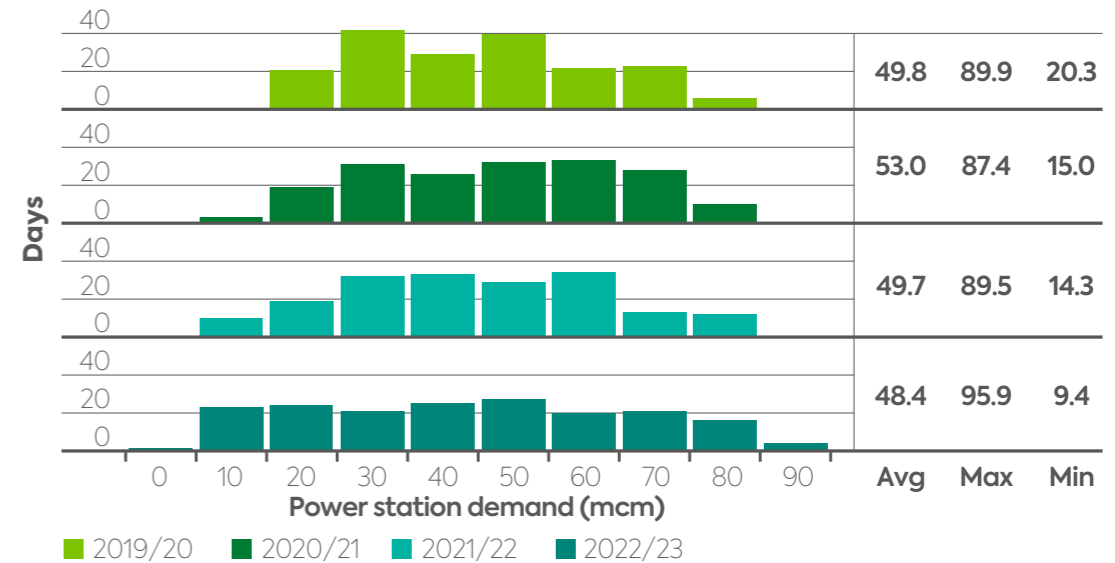


Key insights?

Last winter:

- An average of **33%** of electricity was generated from gas.
- A peak of **58%** of electricity was generated from gas.
- There were **59 days** where at least **40%** of electricity was generated from gas (**21** of these days were over **50%**).

Figure 11
Winter power station daily demands. Number of days' demand for electricity at 10 mcm/d intervals





NTS industrial demand

What did we expect?

– A reduction of circa 0.4 bcm (due to high prices) was built into our Winter Outlook forecast.

What did we see?

– Demand was (0.3 bcm) higher than the Winter Outlook forecast, although quite volatile.

What this could mean for winter 2023/24

– Over the coming months we will seek to gain further insights by talking to the industrial site owners.

Figure 12
Daily NTS industrial demand

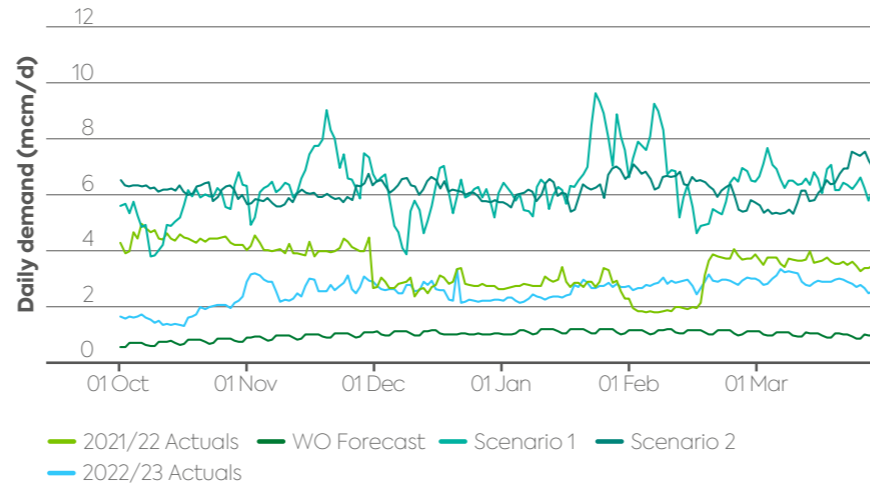
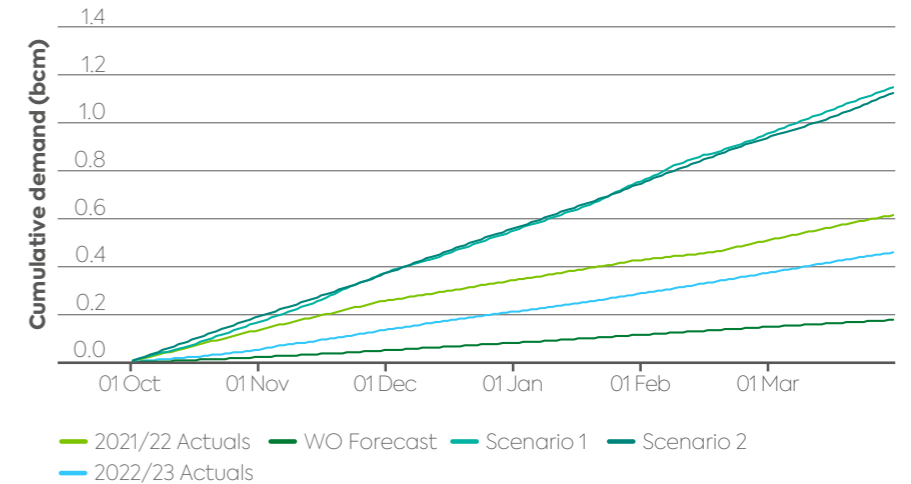


Figure 13
NTS industrial demand YTD



Exports to Ireland

What did we expect?

– An overall increase in demand of 0.5 bcm, driven by the decline of production by the Corrib field but partially offset by demand suppression and fuel switching.

What did we see?

– Demand was 8% lower than forecast in our Winter Outlook, although it increased significantly during periods of cold weather.

– This could be because:

- the Corrib field is declining at a slower rate
- there was a higher level of demand suppression
- there was less need for power generation (exports to Ireland support both heat and power generation).

What this could mean for winter 2023/24

– We will collaborate with Gas Networks Ireland (GNI) over the coming months to understand possible demand patterns.

Figure 14
Daily exports to Ireland

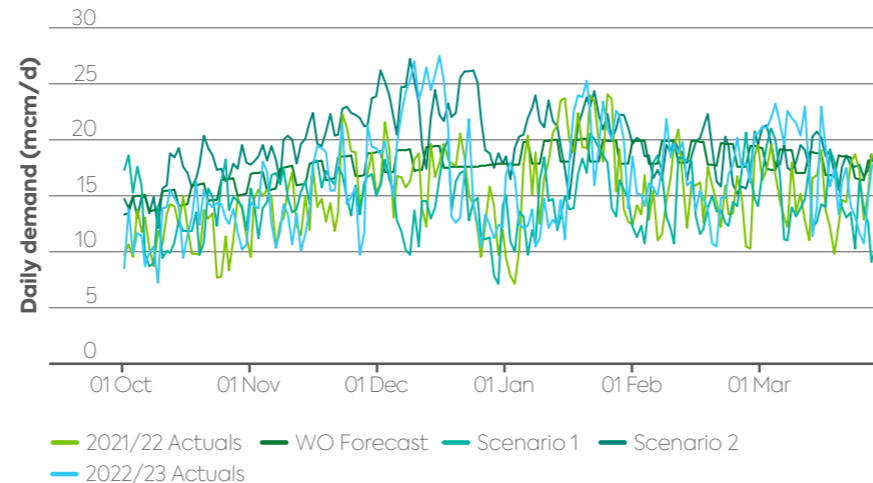
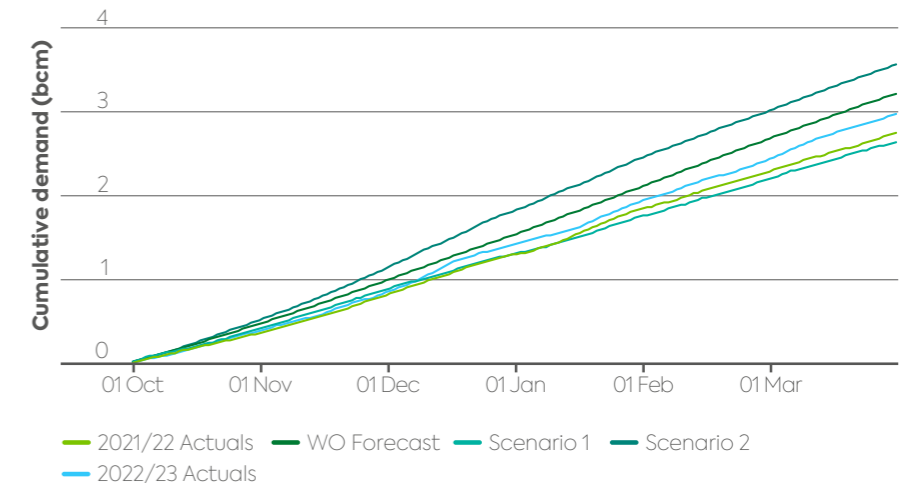


Figure 15
Exports to Ireland YTD





Exports to continental Europe

What did we expect?

- Exports at full capability during October and November were assumed in our Winter Outlook forecast.

What did we see?

- Exports remained high throughout winter when compared to previous years.
- Exports were close to maximum capability during the first part of winter.

What this could mean for winter 2023/24

- We expect interconnector flows to continue to be higher than average, but less than last winter given that there is likely to be additional LNG import capability in Europe.
- If EU storage stocks at the start of winter 2023/24 are lower than they were at the start of winter 2022/23 we could see further levels of export.

Figure 16
Daily exports to continental Europe

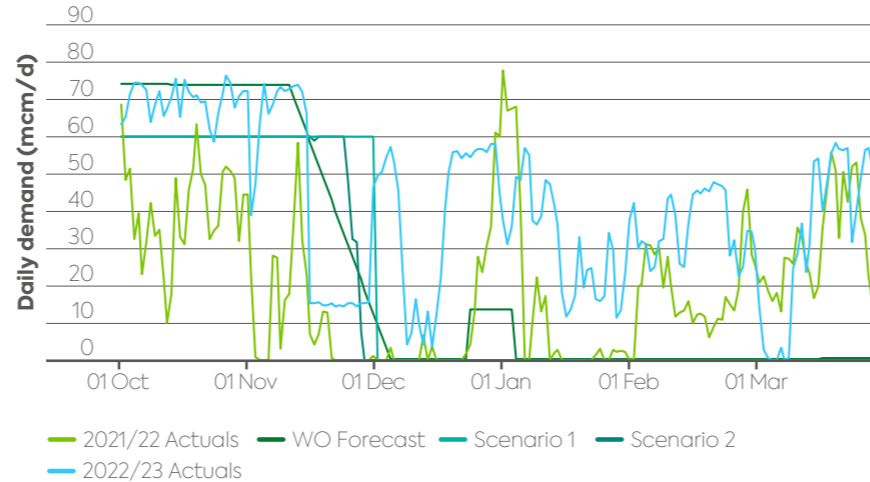
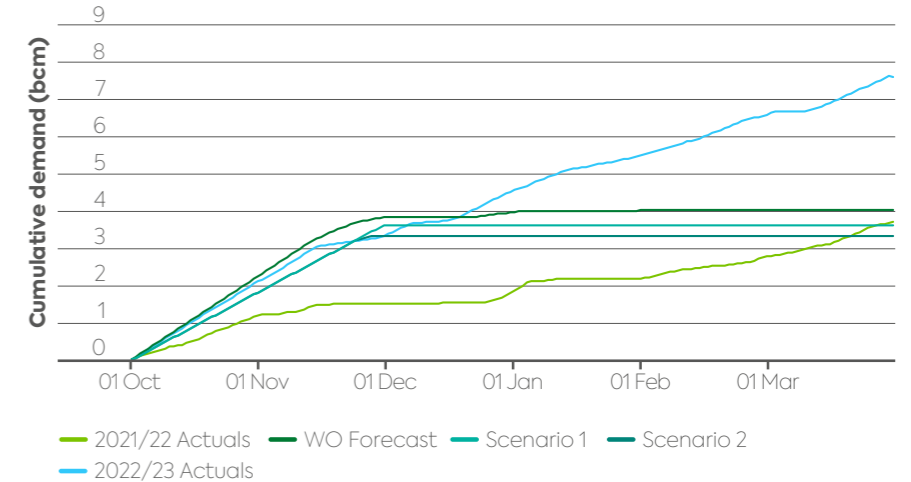


Figure 17
Exports to continental Europe YTD



Exports to continental Europe

The rise in exports of gas from GB to Europe was largely due to the impact of reduced gas flows from Russia, combined with Europe's target to have storage stocks 80% full by 1 November 2022.

The supply constraints and demand levels observed in Europe caused the market to respond as expected, with the price of gas in Europe higher than the prices seen in GB, causing high flows to be directed into continental Europe.

We exported 7.6 bcm to Europe over the winter period, which is the highest number we have seen historically, and around double that of the previous winter.

Exports were close to maximum capability during the first part of winter, then dropped significantly during the second half of November due to Interconnector Ltd being on a planned outage.

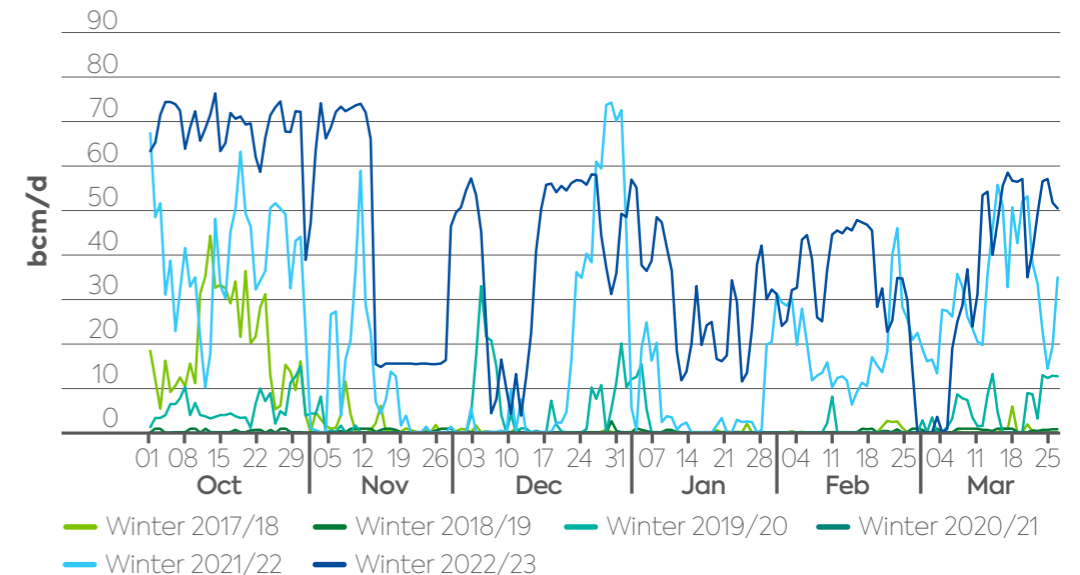
From December onwards exports increased again, however not as close to the maximum levels seen in October and November.

During the cold snaps in December and January exports reduced significantly in response to higher GB demands during periods of very cold weather. At this time, we also saw a small level of imports come to GB.

Gas was also required to support electricity generation in the EU during the first part of winter, due to France's nuclear power fleet having an unusually high number of outages.

During winter, gas was being used for power generation in the UK which was then exported via the electricity interconnectors to the EU.

Figure 18
Winter 2022/23 exports





Supply

[UKCS supply](#)[NCS supply](#)[A deeper dive into Norwegian flows](#)[LNG supply](#)[Storage](#)[Rough storage levels](#)



UKCS supply

What did we expect?

– Steady flows at around 100 mcm/d were assumed in our Winter Outlook forecast.

What did we see?

– Average supplies of 103 mcm/d, which was slightly higher than last year.

What this could mean for winter 2023/24

– UKCS supplies are expected to continue at a steady rate of circa 100 mcm/d.

Figure 19
Daily UKCS supply

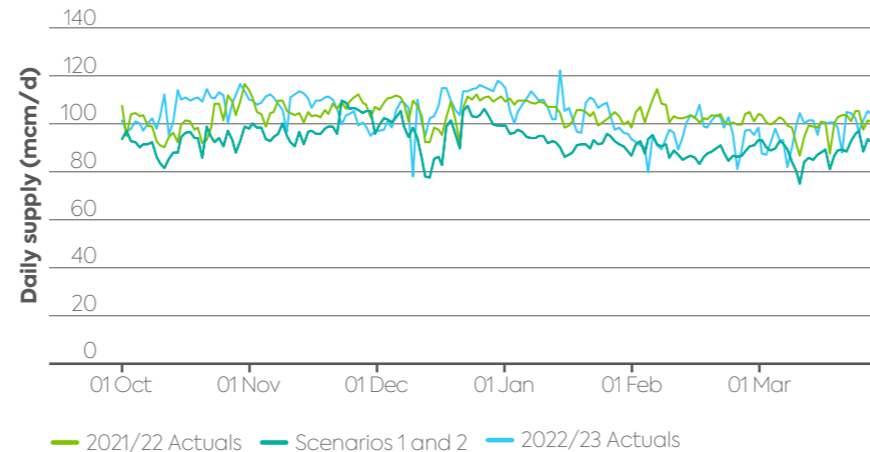
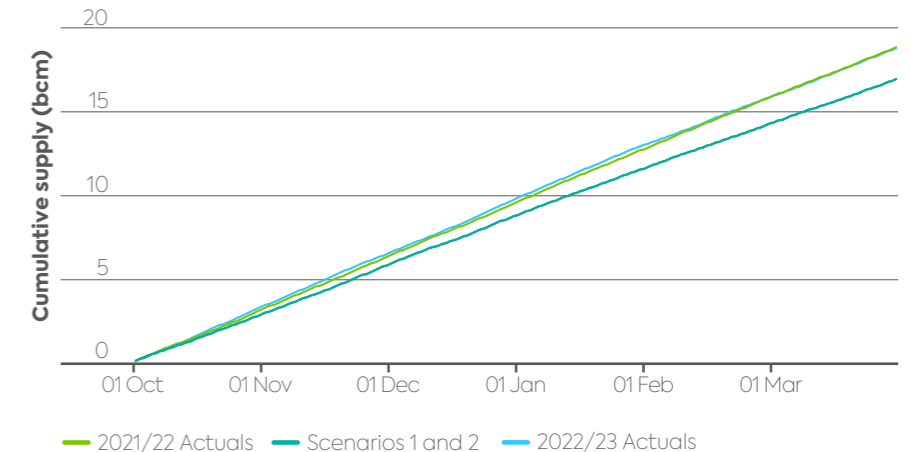


Figure 20
UKCS supply YTD





NCS supply

What did we expect?

– Steady flows to GB at around 100 mcm/d were built into our Winter Outlook forecast.

What did we see?

- Total Norwegian production was lower than forecast at 325 mcm/d.
- Shippers prioritised Europe (due to a positive price differential in Europe) as expected, leading to lower flows to GB at just under 80 mcm/d.
- We observed the market respond to high demand in GB (during the cold snap), with flows to GB prioritised over Europe.

What this could mean for winter 2023/24

– NCS flows will continue to follow market signals, prioritising Europe over GB if prices are higher.

Figure 21
Daily NCS supply

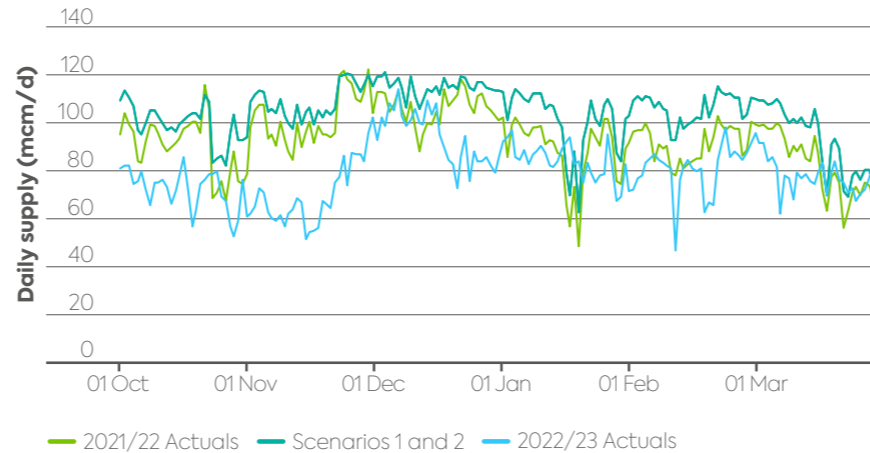
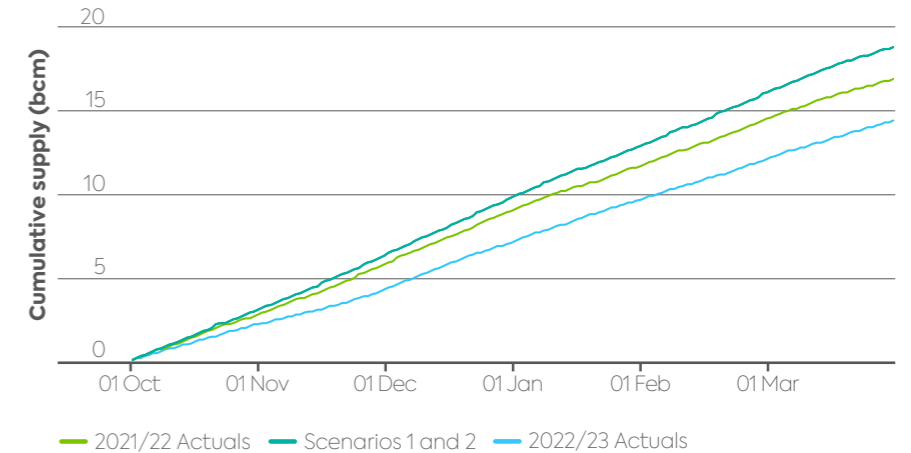


Figure 22
NCS supply YTD



A deeper dive into Norwegian flows

In the early part of winter, we saw Norwegian supplies to Europe at technical capacity (250 mcm/d), with flows to GB being defined by the surplus production available (blue line).

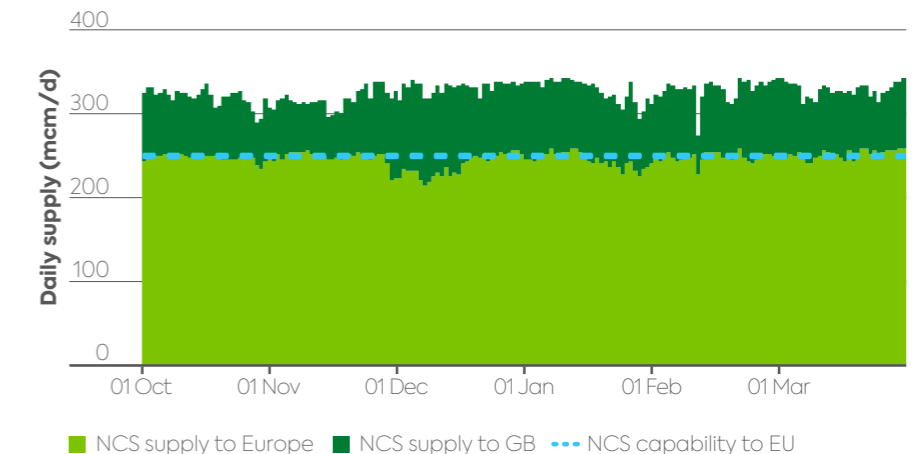
During this period, the prices at European hubs were higher than the UK's National Balancing Point (NBP), meaning gas flows were prioritised to Europe.

As demands increased in December due to cold weather, we saw a price response with GB having a positive price differential to the European hubs. Some Norwegian supplies were diverted from Europe to GB in response to this. The diversion of gas flows was largely from France, with no material change in flows to Germany and Belgium.

The market does not appear to need a high differential to see Norwegian flows respond, which could indicate that during periods of high demand in GB (and a positive price differential) Norwegian flows could divert to GB as needed.



Figure 23
Daily NCS flows





LNG supply

What did we expect?

– We expected LNG to be the main source of flexible supply, in preference to Europe, Norway or storage.

What did we see?

– Total supply of **15.7 bcm**, the highest we have seen in a winter period to date.
– Average supplies of **86 mcm/d**, **37% higher** than the same period last year, supported high levels of exports and cold weather spells in GB. Daily supplies have come close to peak capability.
– Overall, LNG was very similar to scenario 1 (typical winter).

What this could mean for winter 2023/24

– High levels of LNG supply are expected to continue, enabling exports to continental Europe at times of low GB demand.

Figure 24
Daily LNG supply

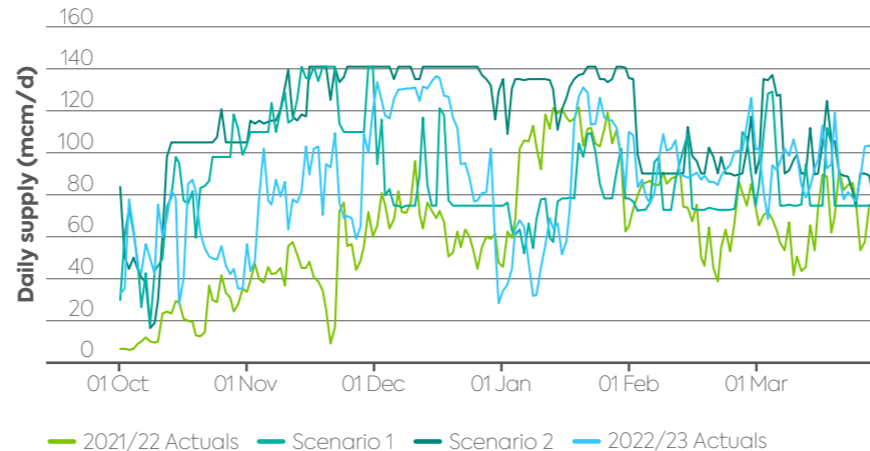
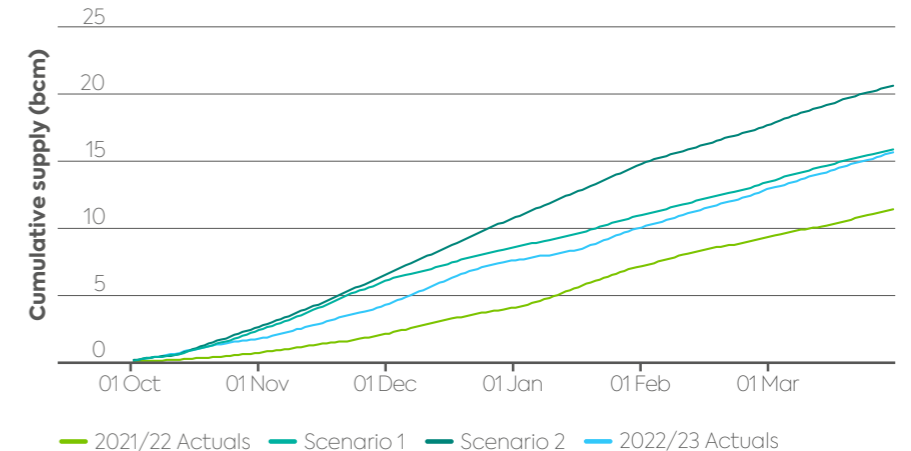


Figure 25
LNG supply YTD



LNG supply – more information

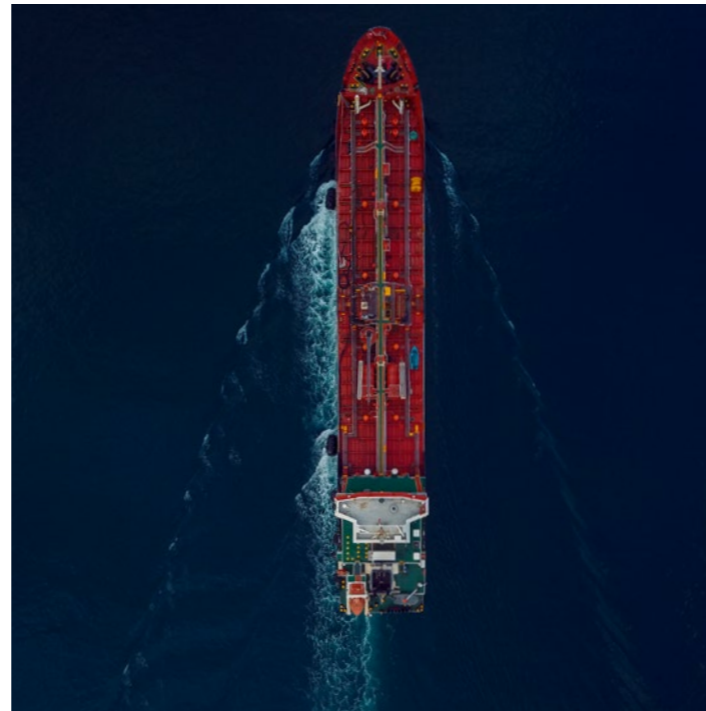
As we expected, LNG supplies were at a record level of 7.6 bcm for winter 2022/23, and some daily supplies have been close to maximum capability.

GB has one of the highest re-gasification capabilities in Europe, we therefore saw the GB network being used as a 'land bridge' with high levels of LNG entering GB to support the record level of interconnector exports.

LNG supplies are flexible and price sensitive. Over the last year, GB has demonstrated the ability to attract LNG shipments in a competitive global market.

During the 2nd half of winter we saw the price differential between European and Asian hubs narrow, which led to Europe receiving more LNG cargoes.

GB continues to receive LNG from a diverse range of global suppliers (see figure 26), with the USA & Qatar being the primary suppliers last winter.

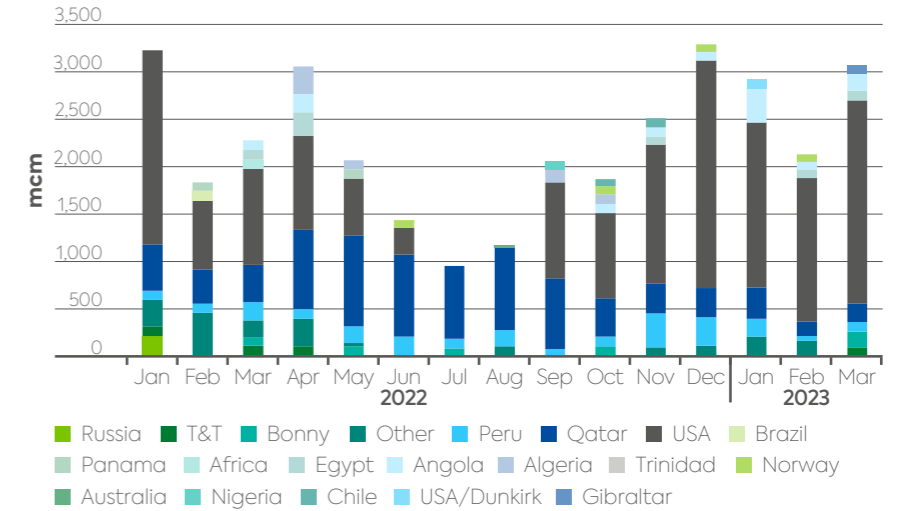


Key insight

For 2 weeks in January, high winds prevented LNG cargoes from docking at Milford Haven. As the winds died down, significant levels of supply flows entered the system which led to some local constraint actions being taken.

You can read more about this in the material presented at our Gas Operational Forum [here](#).

Figure 26
Global LNG supplies to GB



Source: Vesselfinder, Fleetmon, MHPA and Perupetro.



Storage

GB storage facilities behaved as expected, providing flexible supplies on to the NTS when needed. This was particularly evident during the cold snaps in December and January (figure 27).

On gas day 17 January 2023, we saw a total of 70.2 mcm of gas enter the NTS from storage withdrawal, the highest volume observed in the last 18 months.

GB storage played a crucial role over winter, providing supply flexibility (driven by market signals) during periods of high demand and then re-filling during lower demand periods. The level of storage supply available during the cold snaps in winter 2022/23 meant that apart from on a number of specific occasions, EU imports were not required.

Storage stocks at the end of winter 2022/23 were higher than at the same point the previous year due to the Rough storage facility being brought back online by Centrica. If we compare the storage position at the end of winter 2022/23 (excluding Rough), the storage levels are comparable to the previous winter.

Figure 27
Total NTS storage withdrawal

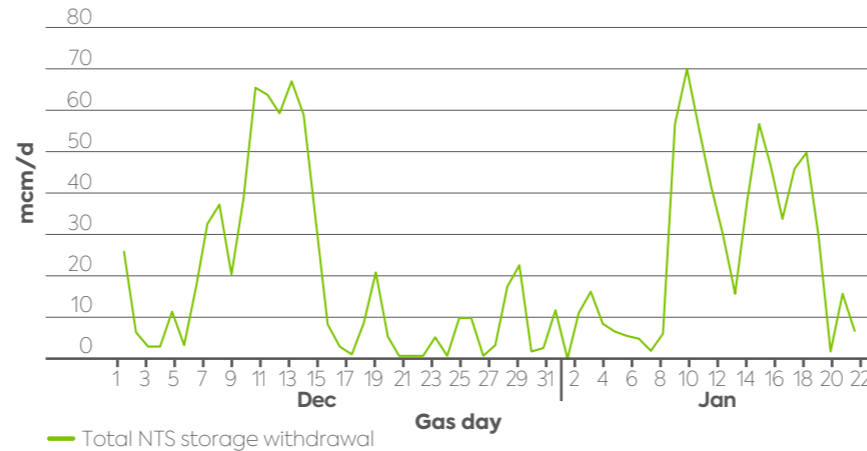
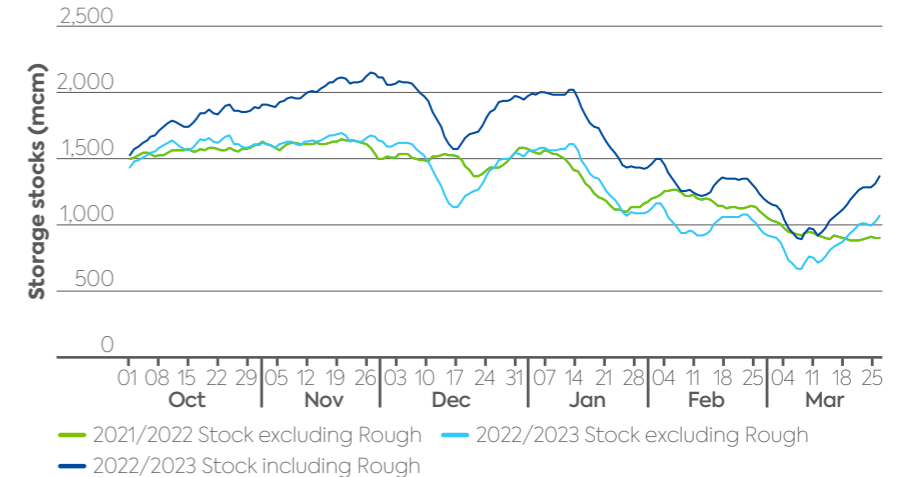


Figure 28
Storage stocks 2021/22 and 2022/23



Rough storage levels

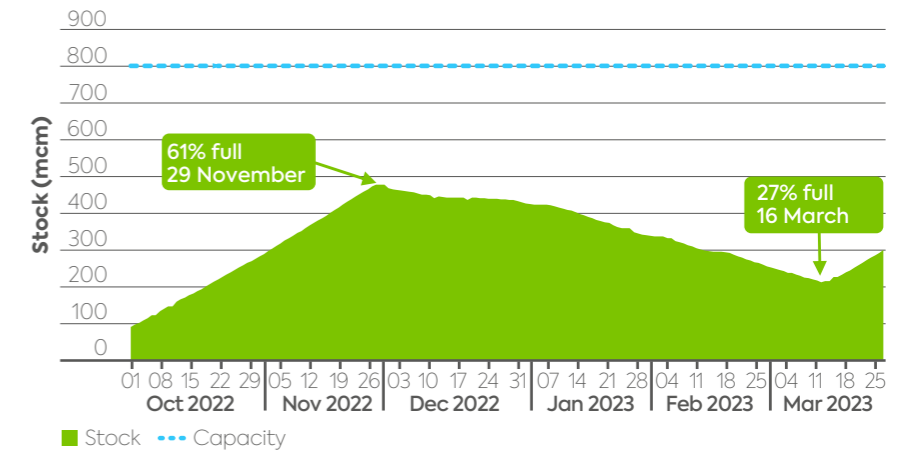


Key insight

- The Rough storage facility, which currently has a capacity of approximately 0.8 bcm, was brought back online ahead of last winter.
- Rough injected gas during the early part of winter and was 60% full by December.
- As expected, when temperatures reduced and demand increased, Rough then started to withdraw gas and was 27% full by 16 March.
- From mid March Rough began to fill again and we'd expect this to continue over summer.



Figure 29
Rough storage levels





Operability

Compressor utilisation and operating the network

Linepack



Compressor utilisation and operating the network

Key observations

- The use of our assets is continually changing due to the variation in supply and demand patterns we see:
- Total compressor running hours were 3,000 hours (11%) higher than the previous winter.
 - The utilisation of individual compressor sites varied significantly across the previous two winters, with some being used for more hours this year.

Figure 30 shows the total supply volumes into each terminal on the NTS (bcm, blue circles), and the compressor utilisation (hours, green circles) over the past two winters (2021/22 and 2022/23).

This demonstrates how different supply and demand patterns change how we operate the network, with different combinations of compressors utilised to move gas from an entry point to meet demand.

An example of this is the use of Kings Lynn compressor, which was used more heavily in winter 2022/23 to enable higher Bacton exports, by directing higher LNG flows from Milford Haven and the Isle of Grain.

The varying nature of supply and demand patterns and the consequential need to use our assets differently, or for more hours, demonstrates the requirement to have healthy and resilient assets to ensure we can continue to meet the needs of our customers.

Figure 30
Variation in supply profiles and compressor running hours between 2021/22 and 2022/23

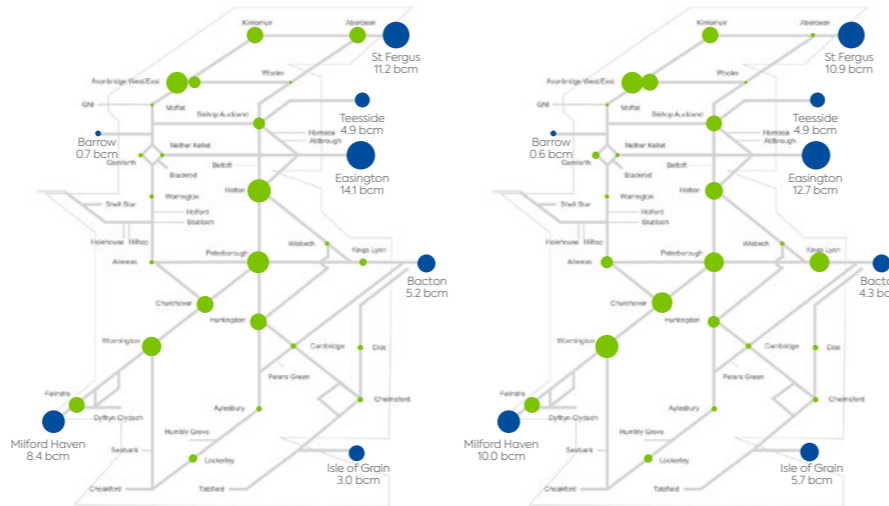
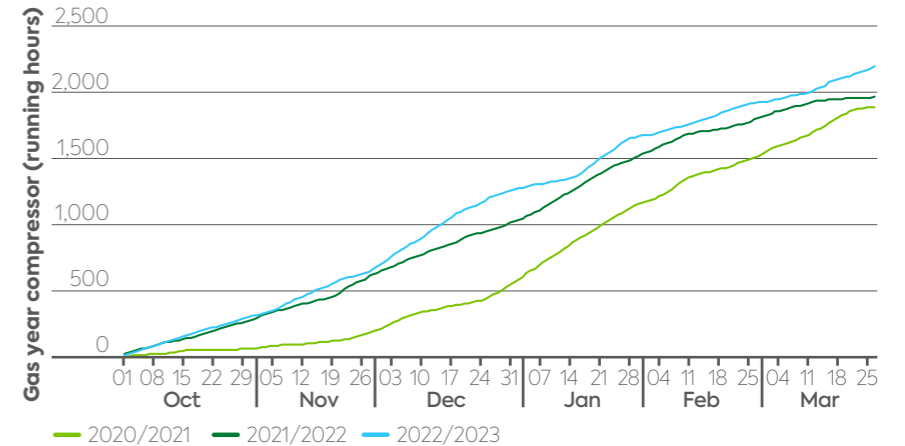


Figure 31
Gas year compressor use (excluding St Fergus compressor)



Linepack

Key observations

- The level of maximum and average linepack utilisation was comparable to previous winters.
- Our customers have told us they really value the ability to supply gas and/or take demand flexibly through the day.



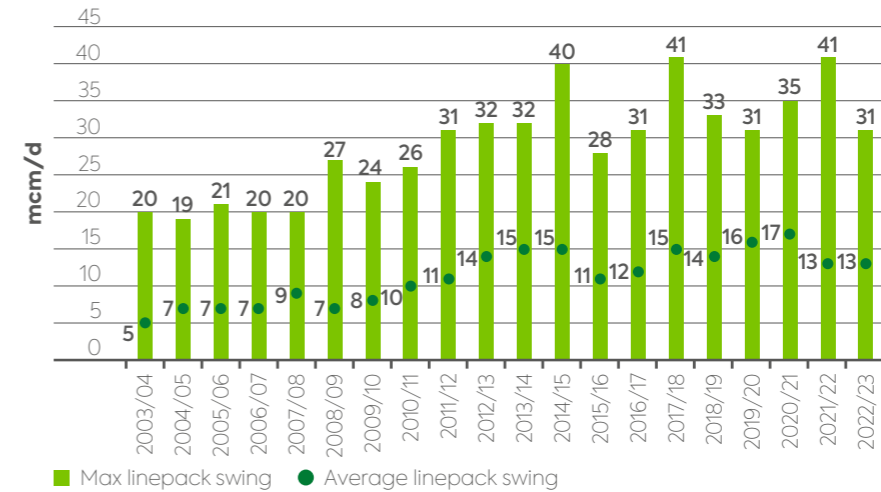
The demand/supply patterns on our network are becoming increasingly unpredictable and volatile. Linepack (the total volume of gas ‘in the pipes’ at any given time) is a critical tool in helping us manage within-day mismatches between supply and demand – the stock of gas in the system allows the network to operate when the volume of supply is different to the volume of demand.

During daily periods of peak demand (typically in the morning and early evening), demand often significantly outstrips supply, with the shortfall being supplied by the system linepack, which is then able to replenish during lower demand periods (such as overnight).

The linepack within the system is regularly utilised by our customers to flex their supply and demand profiles during the day. On the days where there is a high level of linepack swing, additional use of our compressors is needed to maintain gas pressures across the system.

Reliable and resilient assets are therefore crucial to ensure we can manage the variability of supply and demand patterns throughout the day, so that we can move the gas from where it comes in to where it is needed, whilst ensuring system pressures are managed within safe operating limits.

Figure 32
Maximum and average linepack swing





Cold snap spotlight

Cold snap

Cold snap – highest demand day



Cold snap Spotlight

During December 2022 we experienced a sustained cold spell from the ‘Troll from Trondheim’, causing the coldest night of the year, reaching a low of -15.7°C in Aberdeenshire.

The charts on the right show the supply mix during the cold snap this winter (figure 34) and the cold snap scenario based on ‘Beast from the East’ (figure 33), which we presented in our Winter Outlook.

We see a fairly similar supply mix, with steady supplies from Norway and UKCS and LNG & Storage providing flexible supplies. Storage played a very important role during this cold snap, providing higher levels of supply during these cold days.

We observed a small volume of EU imports during the cold snap in winter 2022/23 which shows that the market responded with higher prices in GB driving gas supplies to GB.

Figure 33
Cold snap scenario

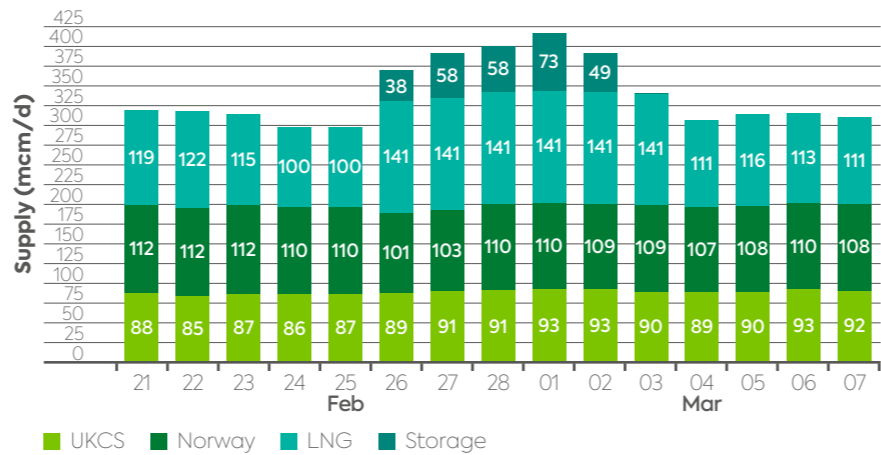
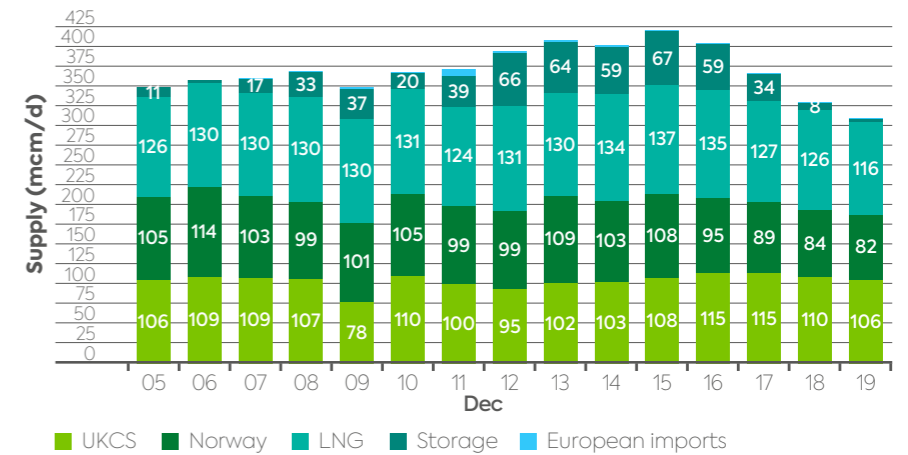


Figure 34
Cold snap – Troll from Trondheim



Cold snap – highest demand day Spotlight

During the December cold snap in winter 2022/23, three days reached over 400 mcm demand, with one of these days reaching 417 mcm (15 December 2022). This is the highest demand seen since ‘Beast from the East’ in 2018.

Due to the diverse and evenly distributed supplies onto the network (figure 35), along with healthy storage levels and linepack, the network functioned reliably.

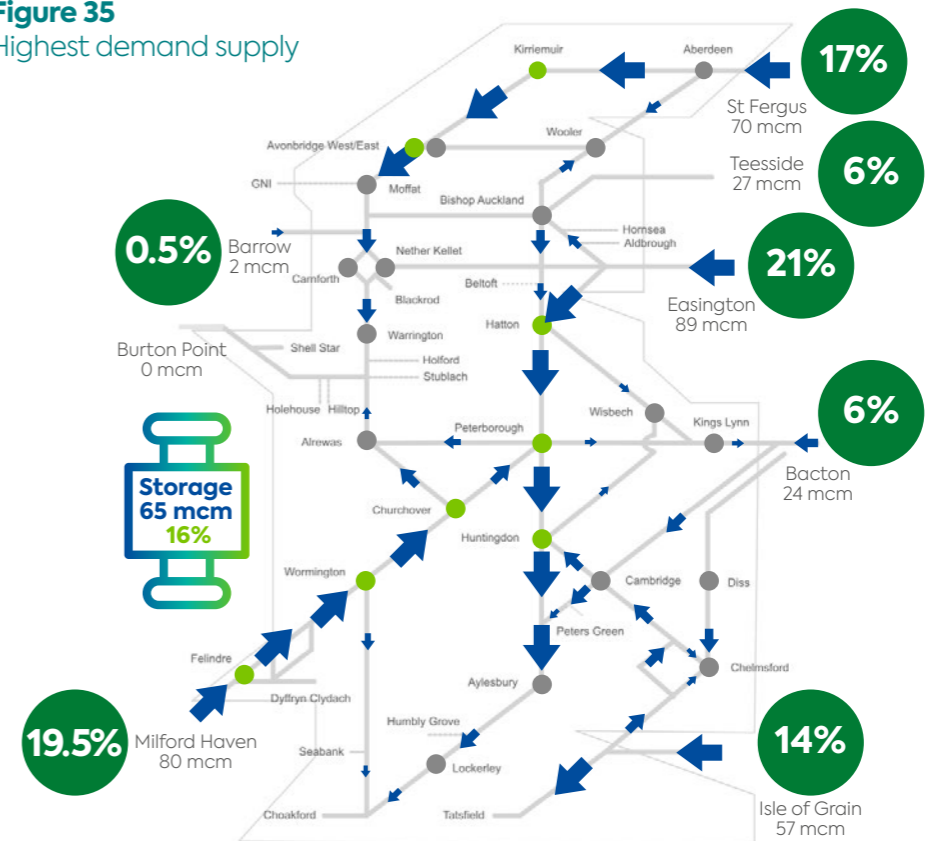
Our operational teams carried out significant and successful preparatory works to ensure asset reliability ahead of winter.

So, why was this day (417 mcm/d) so different to the highest demand day seen during the ‘Beast from the East’ cold snap (418 mcm/d)?

- There were no major supply outages whereas during Beast from the East we witnessed supply outages as the low temperatures led to some offshore assets freezing.
- The line pack was significantly higher than the run up to Beast from the East, which meant we had additional flexibility to manage within-day imbalances.



Figure 35
Highest demand supply





Looking ahead to winter 2023/24

Scenarios

Considerations for winter 2023/24 and our scenarios

Winter preparations 2022/23

Winter preparations 2023/24



Scenarios

In our main Winter Outlook publication in September this year, we will include scenarios again given the uncertainties that remain at play.

We plan to use the same base scenarios for this winter (see table 3), refining them based on what we have learnt from winter 2022/23 and any other intelligence we gather ahead of publishing the Outlook in full.

Some of the factors we will consider in our scenarios can be found on the next slide. If there's anything else you'd like to see in our scenarios, please get in touch with us – contact details are available [here](#).



Table 3

Scenarios

Scenario	Rationale
Scenario 1: Typical winter (2019/20)	We have chosen demands from winter 2019/20 as being representative of the daily demand we would experience in a typical winter.
Scenario 2: Cold winter (2010/11)	We have chosen demands from winter 2010/11 as being representative of a cold winter, as this period contains the highest-ever daily gas demand level seen on the NTS, with sustained high demand throughout the majority of the winter.
Scenario 3: Cold snap (2017/18)	We have chosen demands from winter 2017/18 as being representative of demand levels during an extreme cold snap as this period contains the 'Beast from the East' which resulted in some of the highest daily demand levels seen in the last five years.

Considerations for winter 2023/24 and our scenarios



Please get in touch with us to share your thoughts about the forthcoming winter.

There are a number of areas that we will analyse further and consider for our scenarios as we prepare for winter 2023/24:

- The level of additional re-gasification in Europe along with European storage levels, and how these factors may affect export and import levels.
- The level of demand suppression we may see for both GB domestic demand and Isle of Ireland demand.
- The level of forecast Norwegian production and therefore the potential Norwegian supplies into GB.
- GB storage behaviour observed last winter, and whether this may indicate changes in behaviour.
- Power generation is increasingly dependent on weather and is therefore more difficult to forecast the day to day volatility. We will collaborate with ESO on this element of our outlook.
- We will look into the balance of the global LNG market, considering new liquification projects expected to come online this year along with demand outlooks for key Asian LNG importers such as China and Japan.
- The resilience of our assets inc. completion of asset health and new build works.

Whilst we are, and will be, taking every appropriate step to prepare for the coming winter, there are a number of factors outside of our control that could affect what we see in winter 2023/24, including:

- the weather – a very cold winter will mean higher demands on the NTS
- the cost of energy to end consumers in GB and EU and how this may affect demand
- EU storage position – if low going into winter, we may see greater export demand
- continued disruption to European gas supplies due to the war in Ukraine
- global LNG availability
- currently unforeseen global events.



Winter preparations 2022/23

Ahead of winter 2022/23, as a prudent system operator, we worked closely with the Department for Energy Security and Net Zero (formerly BEIS), Ofgem, and National Grid ESO to develop improvements to ensure we were well prepared to maintain safe and secure operation of the gas transmission system.

We also adapted our approach to communicating with you, providing earlier insight into our winter activities via an Early Winter Outlook and more detail in our Outlook publications with the use of scenarios paired with market analysis. We have also continued more extensive and detailed engagement with our regular Operational Forums. We plan to continue to use and improve this approach for as long as you feel it's useful/needed, so please do let us know your feedback on how we're sharing information with you.

1

Margins notice forecast

We added a new margins notice forecast in addition to our existing five-day-view. This was to provide a view of what the day ahead trigger level might be on any day out to D-7.

We based this on the week ahead demand forecast and different storage and LNG assumptions. The information was published daily on National Gas Prevailing View during the winter period.

2

Operating margin tender

The operating margin (OM) is gas we can use to manage the system at times of stress, as a short term measure. The Operating Margins Portfolio is comprised of LNG, gas in storage and demand reduction contracts (including power generation).

Last winter we carried out a supplementary tender to ensure we had adequate OM procured given the uncertainties that were at play,

We don't anticipate the need for further tenders, as we have taken last year's supplementary tender and additional requirements into account for this year.

3

Demand side response reform

We reviewed demand side response (DSR) as part of our winter preparedness activities.

Following extensive engagement with customers and stakeholders we led on reforms, which allowed shippers to pre-contract for DSR with NGT in return for an availability payment, and enabled shippers without access to the On-The-Day Commodity Market (OCM) to participate in this process.

4

Exercise degree

We expanded our regular emergency exercise to ensure it focused appropriately on Network Emergency Coordinator (NEC) communications with all industry participants, through all stages of an emergency, both in the lead up, during, and post a National Gas Supply Emergency (NGSE).

The exercise was held over a number of days covering:

- emerging issues
- pre-emergency
- emergency
- restoration.

5

MIPI changes

We made a number of changes to the Market Information Provision Initiative (MIPI) to make it easier for stakeholders to access data and information.

Some of the key changes were:

- week ahead view updated to show the difference between Margins Notice Trigger and Demand Forecast Values
- live export flows were made available for each individual interconnector
- instantaneous flow graphs were updated to show flow changes across a period of time rather than one individual snapshot
- an additional two years worth of historical supply and demand data.

Winter preparations 2023/24

As a prudent system operator we continually monitor supply and demand behaviour throughout the year, identifying potential risks and taking appropriate mitigating actions. We also look for opportunities to implement improvements in light of the current geo-political context surrounding the energy landscape.

We continue to work closely with DESNZ on the proposals set out in the [Energy Security Plan](#), published in March 2023, which detail focus areas for enhancing energy security whilst GB transitions to Net Zero. This plan covers items like 'the role gas storage can play' along with many others.

Some specific areas we are currently focussing on as we prepare for winter 2023/24 are below. We will continue to provide updates on our winter preparations at the Gas Operational Forum, if you'd like to sign up to future forums you can do so [here](#).

1 Operating margins

For the 2023/24 OM tender we utilised the same methodology we followed for the tenders in 2022/23, which took into account the changed gas market landscape following Russia's invasion of Ukraine.

Currently we have 948 GWh of OM procured for 2023/24.

2 Demand side response reform

During Q1 2023, we worked with the industry to explore further DSR reforms that could increase the DSR quantities available to NGT from daily metered (DM) sites. Based on shipper and consumer feedback, we have now raised 2 UNC Modifications which we aim to implement ahead of winter 2023/24 which will both enable direct contracting with consumers and introduce a D-5 product, expand eligibility and deliver process enhancements.

3 Exercise Everest

The annual Network Emergency Coordinator (NEC) Assurance exercise will be held over three days in early October, encompassing all gas industry participants, and focussed on the testing of the various stages of a National Gas Supply Emergency (NGSE), including the 'pre-emergency' stage where the industry has been invited to participate in the utilisation of the available commercial tools to balance the system. The exercise will also include whole energy system considerations and involve National Grid ESO and UK Government Department for Energy Security.

4 MIPI changes

Our Market Information Provision Initiative (MIPI) system is heavily utilised by our customers, so we try to make it as easy as possible to use.

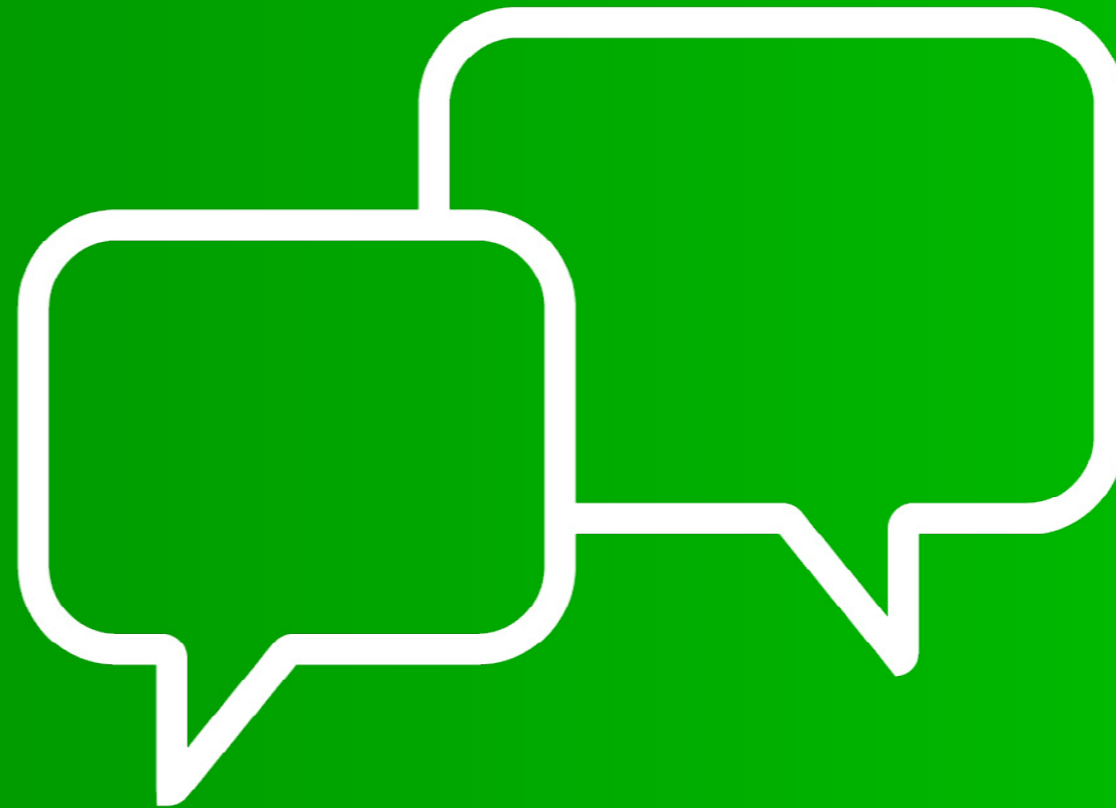
Ahead of this winter we are undertaking a system refresh to make the interfaces more user friendly.



Contact us

[Consultation questions](#)

[Continuing the conversation](#)



Consultation questions

We have set out below some questions that we'd really like to hear your thoughts on, but we would be pleased to hear from you on other topics.

We're particularly interested in understanding:

Publications

- Do you find this publication useful?
- What else would you like to see in our future publications?

Winter 2022/23

- Do you have any insights from winter 2022/23 you can share with us?
- Did you find the scenarios in our Winter Outlook publication useful?

Winter 2023/24

- Are there any specific elements you would like to see included in our scenarios?
- Is there anything specific you are concerned about for this coming winter?

You can find details on how to contact us on the next slide.



Continuing the conversation

We look forward to continuing the conversation with you at our upcoming engagement forums. We regularly attend the Gas Operational Forum to share information and insight around actual supply and demand and how this compares to our forecast and scenarios.

You can find details about the forums, and how to sign up to attend them, on our website.

Your feedback is so important to us

Letting us know what you think of the information we share with you, and how we're sharing it, helps us shape our future communications to ensure we're communicating what matters most, in a way that suits you.

Email us with your views and feedback on our publications to [Andrew Marsh](#).

For any press enquiries, or if you have any comments or questions about the content contained within this publication specifically, please get in touch with our Corporate Affairs team:



Jake Tudge

Contact [Jake Tudge](#) for any enquiries for our leadership team



Ntobeko Chidavaenzi

Contact [Ntobeko Chidavaenzi](#) for any media enquiries



Andrew Marsh

Contact [Andrew Marsh](#) for any general enquiries and feedback

Upcoming Gas Operational Forum dates:

- 22 June 2023
- 21 September 2023
- 19 October 2023
- 23 November 2023.

If you'd like to attend our Gas Operational Forums, you can sign up [here](#).

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Appendix

Data tables in TWh

Data tables in TWh

Table A

Key statistics – historical 2022 and forecast 2023

TWh	2022	2023
GB gas demand *	272.0	243.4
Export gas demand	133.7	60.5
Total gas demand **	462.8	365.7

[A good guide](#) for converting to energy in watt hours from gas volume in cubic metres is to multiply by 11.

So, for example, 4 mcm approximates to 44 GWh, and 80 bcm approximates to 880 TWh.

Note: 1TWh = 1,000 GWh, and 1 bcm = 1,000 mcm

* GB demand is comprised of gas used domestically, and for industry, power generation, and storage injection.

** Total gas demand is GB demand combined with export gas demand (gas exported via interconnectors to mainland Europe and Ireland).

Table B

Breakdown of gas demand in TWh

Demand in TWh	Winter 2020/21		Winter 2021/22		Winter 2022/23		
	2020/21 actual demand	2020/21 weather corrected demand	2021/22 actual demand	2021/22 weather corrected demand	2022/23 forecast	2022/23 actual demand	2022/23 weather corrected demand
NDM	344.3	333.3	309.1	326.7	310.2	272.8	284.9
DM					41.8	41.8	41.8
Industrial	49.5	48.4	44	44	0	5.5	5.5
Power	121	121	111.1	111.1	135.3	102.3	102.3
GB total	547.8	535.7	495	512.6	487.3	422.4	434.5
Ireland	33	33	30.8	30.8	35.2	33	33
Interconnector export	0	0	40.7	40.7	44	83.6	83.6
Storage injection	17.6	17.6	14.3	14.3	15.4	27.5	27.5
Total demand	569.8	557.7	553.3	570.9	584.1	566.5	578.6

NB: All totals include NTS shrinkage and will therefore not tally.



Data tables in TWh

Table C

Breakdown of gas supply

Winter supply (TWh)			
Winter	2020/21 actual	2021/22 actual	2022/23 actual
UKCS	187	185.9	206.8
Norway	205.7	207.9	158.4
EU imports	52.8	5.5	0.66
LNG	97.9	125.4	172.7
Storage withdrawal	23.1	20.9	29.5
Grand total	566.5	545.6	568.7



Glossary

List of glossary terms



Glossary

bcm:

Billion cubic metres.

Compressor:

Compressors are used to move gas around the transmission network through high pressure pipelines. There are currently 71 compressors at 24 sites across the country. These compressors move the gas from entry points to exit points on the gas network. They are predominantly gas driven turbines that are in the process of being replaced with electric units.

Daily metered (DM) demand:

A classification of customers where gas meters are read daily. These are typically large-scale consumers.

Electricity (power) generation:

Electricity generated by the burning of gas.

GB demand:

Demand excluding interconnectors, storage injection and exports to Ireland.

Interconnector:

Two pipelines connecting GB and the EU. The Interconnector (UK) Limited is a bi-directional gas pipeline connecting Bacton in the UK and Zeebrugge in Belgium. BBL is a bi-directional gas pipeline connecting Bacton in the UK and Balgzand in the Netherlands.

Land bridge:

In this context the land bridge refers to connecting the LNG terminals in GB to the interconnector via the NTS.

Local Distribution Zone (LDZ):

This refers to the total amount of gas used by gas consumers connected to the gas distribution networks. This includes residential demand, and most commercial and industrial demand.

Liquefied Natural Gas (LNG):

Natural gas that has been converted to liquid form for ease of storage or transport. It is formed by chilling gas to -161°C so that it occupies 600 times less space than in its gaseous form.

mcm:

Million cubic metres.

Medium range storage (MRS)/GB storage:

Gas storage facilities designed to switch rapidly between injection and withdrawal to maximise the value from changes in gas price.

National Balancing Point (NBP):

The National Balancing Point (NBP) is a virtual trading location for the sale, purchase and exchange of UK natural gas.

National Transmission System (NTS):

A high pressure gas transportation system consisting of compressor stations, pipelines, multijunction sites and offtakes. Pipelines transport gas from terminals to offtakes. The system is designed to operate at pressures up to 94 barg.

NCS/Norway/Norwegian supplies:

Gas supplied to the NTS via pipelines from Norway.

Non-daily metered (NDM) demand:

A classification of customers where gas meters are read monthly or at longer intervals. These are typically residential, commercial or smaller industrial consumers.

NTS shrinkage:

NTS shrinkage is made up of 3 components. Unaccounted for gas (UAG) is unallocated gas or gas that is lost or stolen from the system. Own use gas (OUG) is gas that is used in the running of the system e.g. compressor fuel. And calorific value shrinkage (CVS) is where gas of a particularly low or high CV enters the distribution network which differs with the flow weighted average CV of gas entering that network.

On-the-day commodity market (OCM):

The OCM is the market we use in our role as residual balancer. The balancing market is operated by the ICE Endex exchange, as appointed by National Gas.

Price differential:

The difference in price between markets e.g. GB and continental Europe. Energy supplies tend to flow to whichever market has the highest price.

Total demand:

All NTS demand, including interconnectors, storage injection and exports to Ireland.



Glossary

Troll of Trondheim:

The cold weather spell that came from Scandinavian countries in a weather phenomenon that was called Troll of Trondheim.

UK Continental Shelf (UKCS):

UKCS is made up of the areas of the sea bed and subsoil beyond the territorial sea over which the UK exercises sovereign rights of exploration and exploitation of natural resources.

Weather corrected (demand):

The demand expected with the impact of weather removed. Actual demand is converted to demand at seasonally normal weather conditions, by multiplying the difference between actual CWV and expected CWV by a value that represents demand sensitivity to weather.



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