Gas
Transmission

Gas Summer Outlook Report

April 2021

nationalgrid

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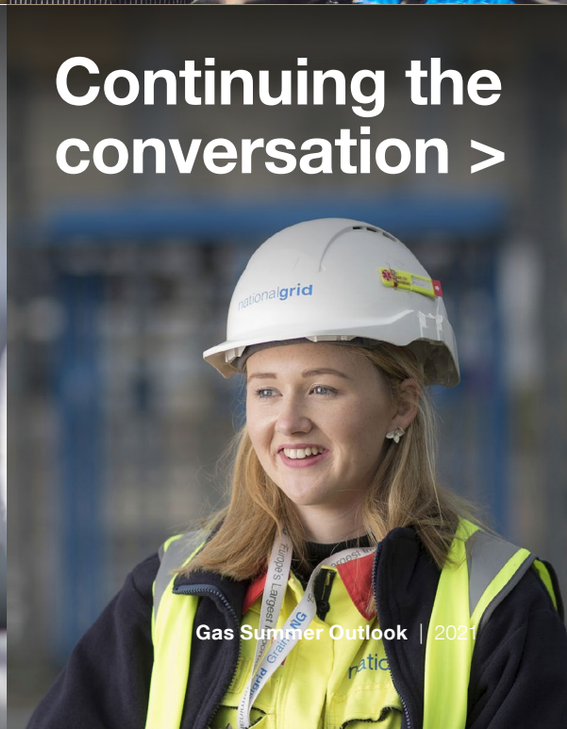


Welcome

How to use this document

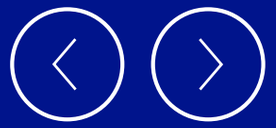
We have published the *Gas Summer Outlook 2021* as an interactive document.

Home

This will take you to the home page.

Glossary

Defined words and additional information (indicated by) can be viewed by clicking the yellow book symbol in the left-hand navigation bar.



Arrows

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

Enlarge/reduce

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

'Linked' content

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

Welcome
to our *Gas Summer Outlook 2021*

This annual publication presents our view of the UK gas system for the summer ahead.

The *Summer Outlook* report is an annual publication delivered each spring. It presents our view of the gas system for the summer ahead (April to September 2021).

The report is designed to inform the energy industry and support their preparations for this summer and beyond.

Other Gas System Operations publications in this suite are:

- ***Winter Review***, published annually, with the next due in June 2021.
- ***Winter Outlook***, published annually, with the next due in October 2021.
- ***Gas Ten Year Statement (GTYS)***, published annually, with the next due in November 2021.
- ***Gas Future Operability Planning (GFOP)***, published periodically based on stakeholder/National Grid requirements.

The analysis within this *Summer Outlook* is underpinned by supply and demand forecasts developed for the *Future Energy Scenarios (FES)* publication produced by National Grid ESO, with the most recent published in July 2020.

I hope you find the *Summer Outlook* both interesting and informative. Please share your views with us to help shape future Outlook reports. You can find details of how to do this at the end of this document in 'Continuing the conversation'. We can also be contacted via .box.OperationalLiaison@nationalgrid.com

Ian Radley
Head of Gas System Operations

Executive summary

Key messages

Executive summary

Key messages

1

We expect there will be sufficient gas supply available to meet energy demands for the coming summer. We expect similar geographical patterns of supply and demand to summer 2020. During periods of low demand, supply availability is significantly in excess of demand and is available from multiple diverse sources. Any reduction in supply at a specific location would be balanced by an increase in supply at an alternative location.

2

We have the right tools and services available to manage operability safely and efficiently. Low demand conditions on the national transmission system (NTS) increase network resilience. We expect to have the assets and the commercial market tools available that are necessary to operate the network as normal.

3

COVID-19 lockdown control measures in 2021 will not affect the safe and secure operation of the NTS. Should similar measures to those experienced in 2020 continue to be in place this coming summer, then the operation of the NTS, under typical seasonal and maintenance conditions for this time of the year, will be unaffected.

Table 1.1

Table 1.1
Key statistics – historical (2020) and forecast (2021)

(bcm)	2020	2021
GB gas demand[1]	25.8	23.2
Export gas demand	7.5	9.0
Total gas demand[2]	33.5	32.4

Weather corrected historical- and forecast-gas demands for the 2020 and 2021 summers respectively. Please note the difference in GB gas demand and total gas demand will not be equal in value to export gas demand due to shrinkage. A version of this table with values in TWh, can be found in the appendix.

[1] GB demand is comprised of gas used domestically, and for industry, power-generation, and storage injection.

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

Demand

Demand

Demand

Table 1.2

Key messages

- Total forecast GB demand for summer 2021 is lower than for previous years, largely due to the reduction in gas-fired electricity generation.
- Exports to Ireland in summer 2021 are expected to increase due to the reductions in gas produced from the Corrib field which supplies gas to Ireland.

Total NTS demand for summer 2021 (32.4 bcm) is forecast to be comparable to that experienced for the same period in 2020 (April to September, 33.5 bcm, table 1.2).

The growth in renewables and the commissioning of a new electricity interconnector reduces forecast electricity generation demand again this summer. Electricity generation is forecast to be 7.9 bcm, continuing a decline from a high of 11.6 bcm in 2016. Whilst declining, demand in this category can still fluctuate based on the weather and market conditions.

The volume of LNG that comes to GB is dependent on global markets; in 2020 we saw significant LNG supply flows and this suppressed the UK domestic gas price, making exports to Europe more viable. As a result of this we saw a higher volume of export flows to Europe in 2020 compared to the previous two summers.

Table 1.2
Forecast total gas demand (bcm) for summer 2020 and 2021, and historical (2015–2020)[1]

(bcm)	2016	2017	2018	2019	2020 forecast[2]	2020 weather corrected actual	2020 actual	2021 forecast
Non-daily metered demand (NDM)	11.1	10.4	10.6	11.4	11.7	11.0	10.4	11.3
Daily metered (DM) and industrial demand	4.1	4.4	4.1	4.2	4.0	3.9	3.9	4.0
Electricity generation	11.6	10.5	10.3	10.6	9.8	9.3	9.3	7.9
GB gas demand	26.8	25.3	24.9	26.2	25.5	24.3	23.7	23.2
Ireland	1.7	1.6	1.6	2.0	2.1	2.2	2.2	2.5
Export to mainland Europe	5.2	7.0	4.5	4.3	4.9	5.3	5.3	4.4
Storage injection	2.6	2.5	2.3	2.2	2.1	2.1	2.1	2.1
Total gas demand	36.4	36.6	33.3	34.8	34.9	34.1	33.5	32.4

[1] All totals include NTS shrinkage and will therefore not tally.
[2] Data provided from *Gas Summer Outlook 2020.*

Note: forecasts for 2020 and 2021 do not account for any potential impact due to COVID-19 control measures. A version of table 1.2 with values in TWh can be found in the appendix.

Demand

Figure 1.1

We expect that exports to Europe in 2021 will be comparable to previous years, however a number of factors could influence the accuracy of our forecast:

- Changes to the charging regime in the UK may influence the commercial incentives for gas to flow across the interconnectors.
- European storage stocks are lower than observed this time last year, which may lead to increased demand for gas in Europe.

An increase in exports to Ireland is expected this summer (2.5 bcm compared to 2.2 bcm in 2020) as production from the Corrib field continues to decline.

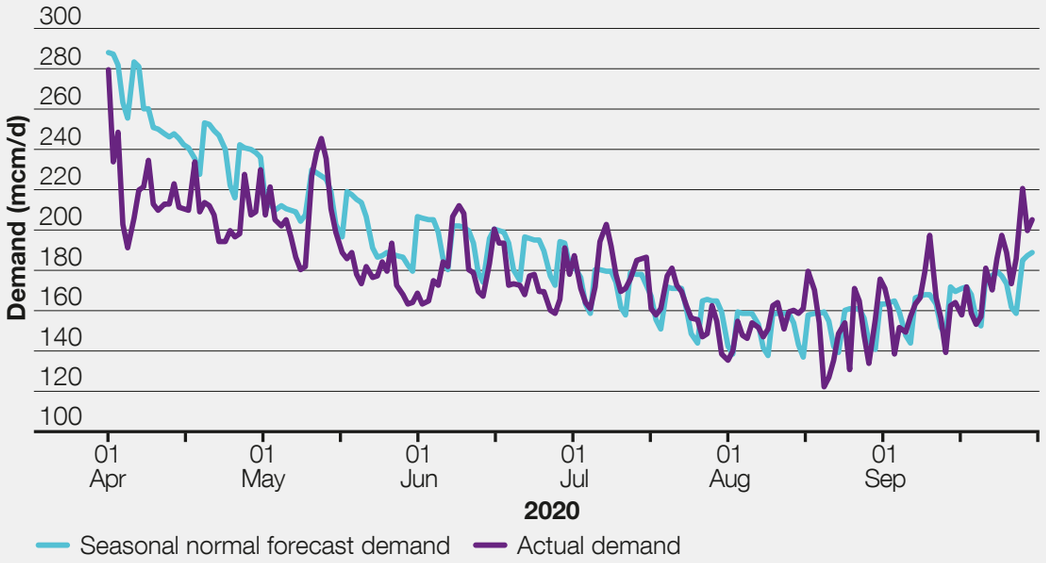
The total observed demand for summer 2020 was lower than the forecasted seasonal normal.

During the early part of the summer (April to the start of June 2020) we observed the largest reduction in demand when compared to the forecast seasonal normal (figure 1.1). This was largely due to the impact of COVID-19 control measures, with industry and businesses being closed.

As the lockdown controls were eased, industry, businesses and homes returned to more normal behaviours of gas use, and the difference between demand and the seasonal normal forecast reduced from June 2020 to the end of the summer.

More information on the impact of COVID-19 on NTS demand can be found in the suite of webinars on our data community website.

Figure 1.1
Forecast seasonal normal total demand vs. actual total demand for summer 2020.



Given the range of control measures experienced throughout 2020, and the difference in demand compared against forecast seasonal normal behaviour, we are confident that the operation of the NTS will be unaffected should similar lockdown controls still be in place this coming summer.

Supply

Supply

Table 1.3 Figure 1.2

Key messages

- The total supply volume over the summer period (April to September) is forecast to be lower in 2021 (32.4 bcm) compared to 2020 (33.1 bcm actual, table 1.3).
- The volume of LNG deliveries to GB are forecast to be lower than the previous two summers, due to competing markets for LNG. Further information can be found in the liquefied natural gas section.

This summer we are anticipating greater volumes of gas being supplied from Norway compared to the same period in 2020, when Norwegian supplies were suppressed by the high LNG flows experienced to GB. Lower LNG flows forecast for summer 2021 will allow for greater flows from Norway (table 1.3).

In 2020 LNG supplies reached a five year high (7.1 bcm), and are forecast to be lower this summer (5.7 bcm). For more information see the liquefied natural gas section.

Supplies from the Continent are again not expected this summer, due to higher prices on both the Dutch (Title Transfer Facility, TTF) and Belgium energy markets (figure 1.2 demonstrating this for TTF) making flows to the UK via the NBP commercially unfavourable. This is unchanged from the past four summers, and is not due to the UK leaving the EU at the end of 2020.

Table 1.3
Summer gas supply volumes (bcm) by source – historical (2016–2020) and forecast for 2020 and 2021

(bcm)	2016	2017	2018	2019	2020 forecast[1]	2020	2021 forecast
UKCS	16.2	17.4	16.8	16.9	15.8	15.9	15.6
Norway	12.4	13.1	13.3	9.8	10.5	8.8	9.8
Continent	0.5	0.1	0.1	0.0	0.1	0.0	0.0
LNG	5.3	3.2	1.4	6.0	6.7	7.1	5.7
Storage	1.2	1.9	1.3	1.4	1.4	1.3	1.4
Total	**35.6**	**35.7**	**32.8**	**36.1**	**34.4**	**33.1**	**32.4**

Figure 1.2
Historical price difference (spread) between the Dutch energy market (TFF) and GB market (NBP) (March 2020 to current date).[2]

[1] Data provided from *Gas Summer Outlook 2020*. A version of table 1.3 with values in TWh can be found in the appendix.

[2] This chart has been developed by National Grid using confidential proprietary data from the Argus Media Group under licence. Argus shall not be liable for any loss or damage arising from any party's reliance on this data.

Liquefied natural gas

Figure 1.3

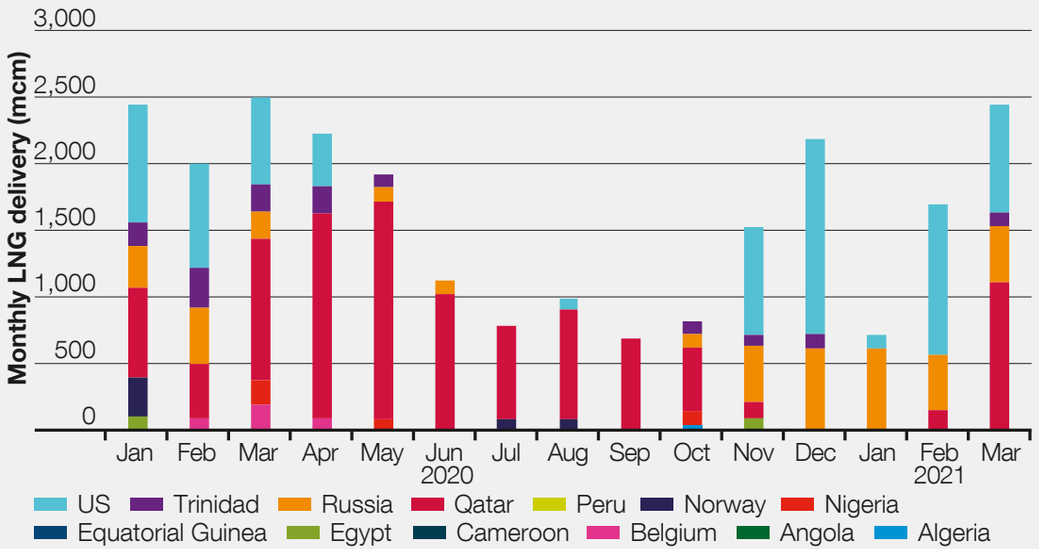
Key messages

- A five year high in the volume of liquified natural gas (LNG) being supplied to GB was observed in summer 2020, however volumes are forecast to be lower in 2021.
- Due to their high diversity of supply, GB and mainland Europe act as swing markets for LNG. A global surplus of LNG production saw LNG supplies to GB reach a five year high in summer 2020. We expect increases in demand in Asian markets to reduce the volumes of LNG available to GB and Europe this summer.

GB has historically had a diverse range of global suppliers of LNG, and this is expected to continue throughout 2021 (figure 1.3).

Summer 2020 saw a reduction in the volume of US and Russian deliveries to GB. Data has suggested that this was not due to shutdowns in production because of the COVID-19 pandemic. These were commercial decisions due to lower prices in the GB gas market making the NTS less attractive to deliver LNG.

Figure 1.3
LNG delivery cargoes by global source – historical, 2020–2021 (to date).[3]



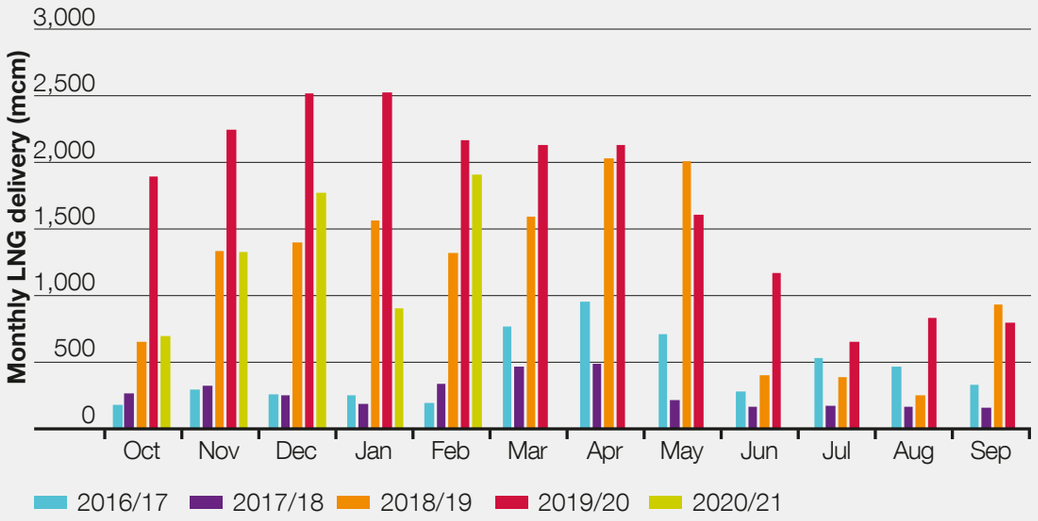
[3] This chart has been developed by National Grid using confidential proprietary data from the Argus Media Group under licence. Argus shall not be liable for any loss or damage arising from any party's reliance on this data.

Liquefied natural gas

LNG flows to GB reduce in the summer months compared to the winter, as it becomes more commercially favourable to transport gas to Asia (figure 1.4) combined with a lower excess of global volumes of LNG.

Figure 1.4

Figure 1.4
Monthly LNG delivery – historical, 2016–2021 (to-date).[4]



[4] This chart has been developed by National Grid using confidential proprietary data from the Argus Media Group under licence. Argus shall not be liable for any loss or damage arising from any party's reliance on this data.

Export to mainland Europe

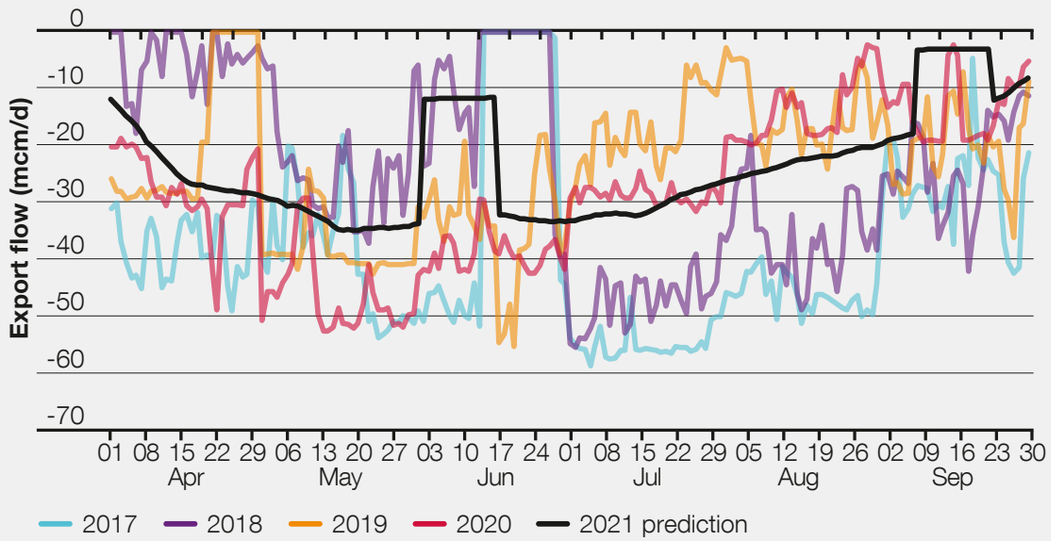
Figure 1.5

Key messages

- We anticipate no additional operability challenges this summer resulting from the UK leaving the EU. We left the EU at the end of January 2020 and the transition period ended on 31 December 2020.
- Forecast export flows to Europe are comparable to previous years, however European storage stocks are lower than observed this time last year, which may lead to increased demand for gas in Europe.

Total historic (2017 to 2020) and 2021 forecast interconnector exports to mainland Europe are presented in figure 1.5. During periods of the 2021 summer (June and September 2021 respectively), both the IUK and BBL interconnectors will be on planned maintenance with reduced capability to export gas from the NTS.

Figure 1.5
Total interconnector export flows for Bacton IUK and BBL – historical (2017–2020) and prediction for 2021.



Export to mainland Europe

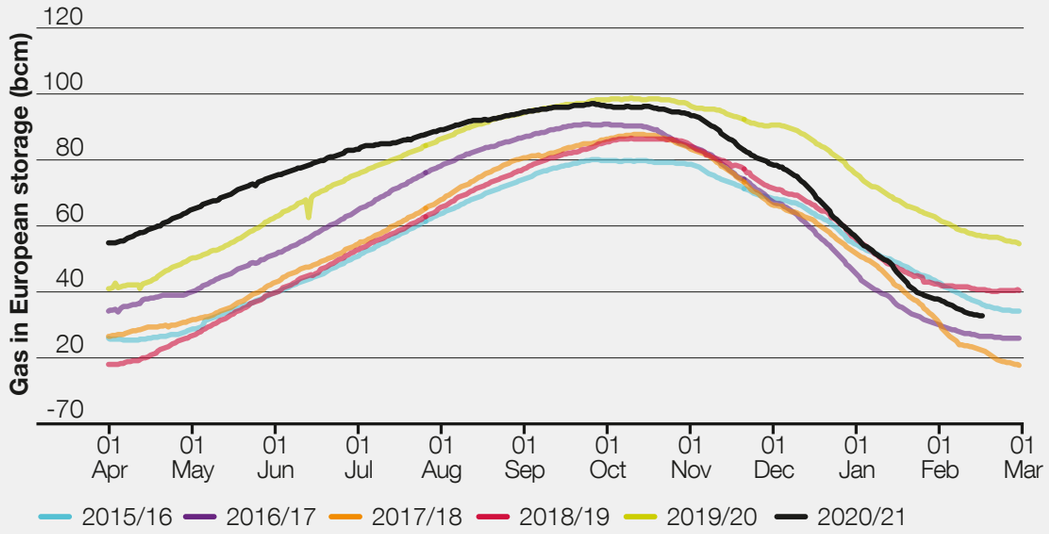
Figure 1.6

As a result of a dispute between Russia and the Ukraine leading up to the 2019/2020 winter, there was a concern regarding Russian gas supplies coming into Europe via the Ukraine. This led to increased restocking of European storage sites in preparation for a potential constraint over that winter. However, this constraint did not occur, which left European storage stocks at the end of the 2019/2020 winter at a higher level than usual (figure 1.6).

In the following summer (2020), high volumes of LNG were observed in GB, which reduced domestic gas prices and led to European storage stocks further refilling because of increased export flows from GB. This winter (2020/21), less LNG has been supplied to GB compared to previous years (see the liquified natural gas section).

At the time of writing (February 2021), although within the normal range, storage stock levels on mainland Europe are lower than for the same time in 2020 (39% full, compared to 64% in 2020, figure 1.6). With lower LNG flows to GB forecast this summer, increased export flows to the Continent to refill storage could still be possible, if there are commercially favourable conditions between the GB and European energy markets.

Figure 1.6
Total gas in European storage, April 2015 to date.[5]



[5] This chart has been developed by National Grid using data from AGSI (https://agsi.gie.eu/). AGSI shall not be liable for any loss or damage arising from any party's reliance on this data.

Storage

Figure 1.7

Key messages

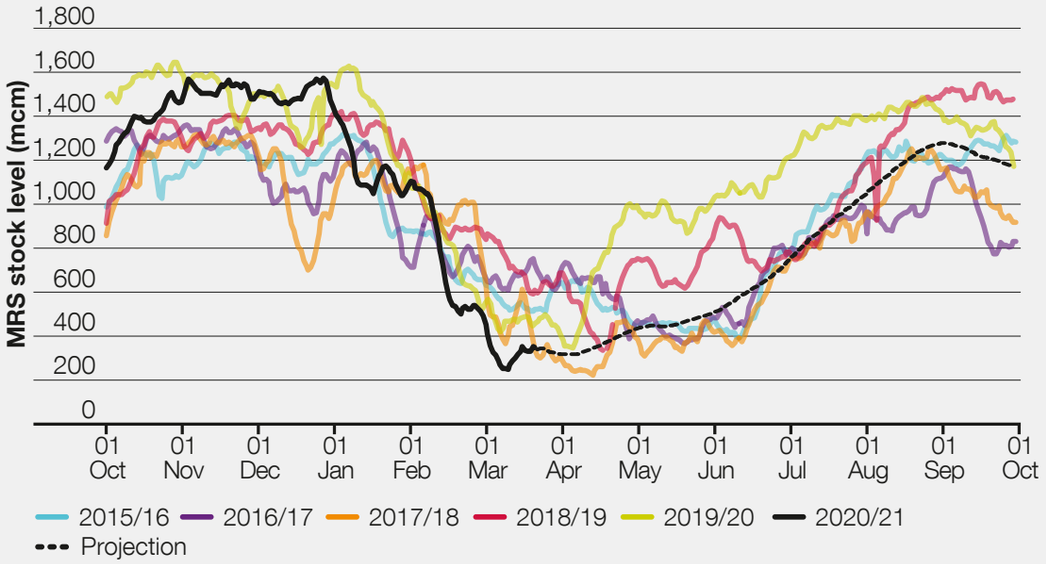
- Storage stocks at the end of this summer, ahead of winter 2021/22, are forecast to be within the normal range.

Medium-range storage (MRS) stock levels over the gas year (October to the following September) are presented in figure 1.7.

MRS stock levels over the previous summer were renewed faster than typically observed over this period of the year. This was due to a combination of the large volumes of LNG being delivered to GB, and lower LDZ demands during the first two phases of the UK's pandemic control measures, creating a surplus of gas.

Based on current projections (in February 2021), due to the reduced volumes of LNG and the increased exportation of gas to mainland Europe (see sections on liquified natural gas and export to mainland Europe), MRS stock levels in October 2021 are forecast be within the normal range.

Figure 1.7
MRS stock levels – historical from October 2015 to March 2021, and projection for summer 2021 (April to September).



Spotlight

Milford Haven

Spotlight

The increase in gas imported from sources such as LNG (and including European interconnectors and Norway), away from GB's historically indigenous sources of gas, has allowed National Grid greater flexibility in managing the operational challenges of a rapidly-changing gas system.

Since coming online in 2009, the Milford Haven LNG terminals in South Wales (Dragon and South Hook) have seen annual flows over the summer of 1 to 9 bcm (figure 1.8, on the next slide). In 2019 we observed an increase in the volumes of gas being delivered by both terminals, and more days on which flows approached maximum capability. This was repeated in 2020 and is expected to continue this summer (figure 1.9, on the next slide).

During periods of near maximum flow, the use of commercial tools alongside physical assets are used to keep the network within safe operating limits. This puts extra reliance on key infrastructure and therefore any short-term asset unavailability (as can be experienced over the summer maintenance period) requires the use of commercial options to maintain the network operating within these limits.

Spotlight

Figure 1.8 Figure 1.9

Milford Haven

Spotlight

Due to a combination of the domestic gas market being commercially attractive at peak times of the year, and the strong global production of LNG, we believe the trend of high LNG supplies to GB is likely to continue.

To manage both this and the need for long-term network flexibility and reliability, we are looking to invest in infrastructure in the western area of the NTS via the PARCA process.

For further information on the PARCA process, please visit this PARCA link, and further information on the Milford Haven ASEP PARCA project can be found here.

Figure 1.8
Total (South Hook and Dragon) volumes of LNG supplied to the NTS from Milford Haven over the 2011 to 2020 summers.

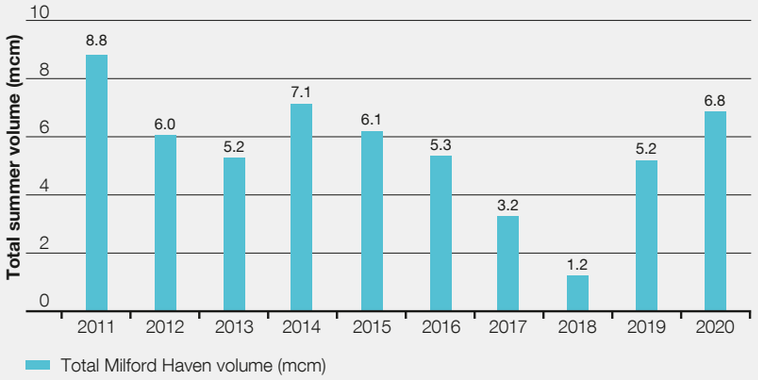
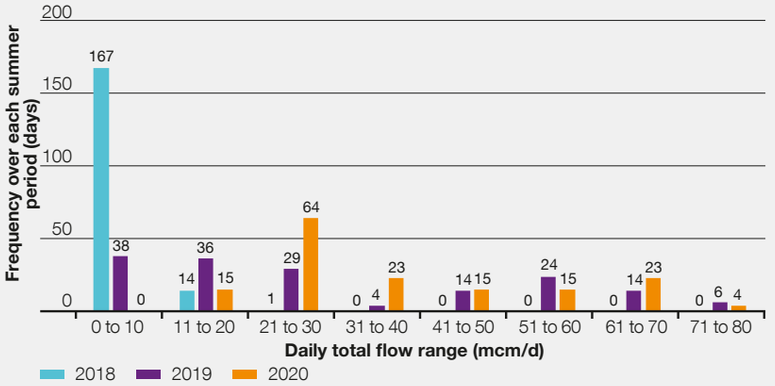


Figure 1.9
The number of days in each summer where total daily flow from Milford Haven (mcm) were observed within 0–80 mcm.



Operational outlook

Operational outlook

Operational outlook

Key messages

- We have implemented plans to enable us to continue to operate and maintain the NTS safely and securely during the current COVID-19 pandemic, and we keep these under continual review.
- We will continue to work closely with our customers to minimise the risk of interruptions in their ability to deliver and offtake gas during the summer maintenance period.

Any changes in the use of gas following the UK's lockdown measures to control the COVID-19 pandemic did not result in any additional operability challenges for us.

We anticipate this position to be the same throughout the forthcoming summer as the easing of controls continues, combined with the new ways of working adopted by National Grid over the past year.

As demand is lower during the summer, and there is a high availability of gas which reduces domestic prices, excess supply is typically met through an increase in demand from both interconnector exports to Europe and domestic storage injection. The requirement for compression changes from needing to move gas to the extremities of the network during the winter to moving gas away from entry points in the summer.

The need for operational flexibility is therefore important. The rapidly changing dynamic of the NTS means that we are prepared to use compression at short notice, to both maintain locational pressures and to respond to changes in the supply of LNG which can occur in the summer due to sensitivities in the global markets.

The summer presents the best time of the year to invest in the maintenance and upgrade of our assets while demands are lower. Compared to previous summers there is a small increase in the maintenance and capital works programme in 2021; resulting in some reduction in network flexibility whilst selected assets are unavailable.

Operational outlook

Network flexibility is managed carefully through the phasing of work, and close working relationships with connected parties, to ensure there is no impact on the overall capability of the network.

The maintenance of our assets, in particular compressors, is vital for enduring network reliability and facilitating operational flexibility. This flexibility allows us to rapidly respond to the diverse supply patterns observed throughout the year, and manage our maintenance programmes with as minimal impact as possible on our customers.

Further details of our maintenance plans can be found via this link.

Improving access to data

In response to a number of recent industry engagements, we have mobilised a programme of work to identify and deliver enhancements to the operational data currently provided to the industry through our website.

For more information please refer to our Operational Data User Guide.

Appendix – data tables in TWh

Table 1.4 Table 1.5

Table 1.4
Key statistics – historical (2020) and forecast (2021)

(TWh)	2020	2021
GB gas demand[1]	254.3	242.8
Export gas demand	81.6	94.2
Total gas demand[2]	338.1	339.1

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

Table 1.5
Forecast total gas demand (TWh) for summer 2020 and 2021, and historical (2015-2020)[3]

(TWh)	2016	2017	2018	2019	2020 forecast[4]	2020 weather corrected actual	2020 actual	2021 forecast
Non-daily metered demand (NDM)	116.2	108.9	111.0	119.3	122.5	115.1	108.9	118.3
Daily metered (DM) and industrial demand	42.9	46.1	42.9	44.0	41.9	40.8	40.8	41.9
Electricity generation	121.4	109.9	107.8	111.0	102.6	97.3	97.3	82.7
GB gas demand[1]	280.5	264.8	260.6	274.2	266.9	254.3	248.1	242.8
Ireland	17.8	16.7	16.7	20.9	22.0	23.0	23.0	26.2
Export to mainland Europe	54.4	73.3	47.1	45.0	51.3	55.5	55.5	46.1
Storage injection	27.2	26.2	24.1	23.0	22.0	22.0	22.0	22.0
Total gas demand[2]	381.0	383.1	348.6	364.3	365.3	356.9	350.6	339.1

[1] GB demand is comprised of gas used domestically, and for industry, power-generation, and storage injection.
[2] Total gas demand is GB demand combined with Export gas demand (gas exported via interconnectors to mainland Europe and Ireland.
[3] All totals include NTS shrinkage and will therefore not tally.
[4] Data provided from *Gas Summer Outlook 2020*.

Note: forecasts for 2020 and 2021 do not account for any potential impact due to COVID-19 control measures.

Appendix – data tables in TWh

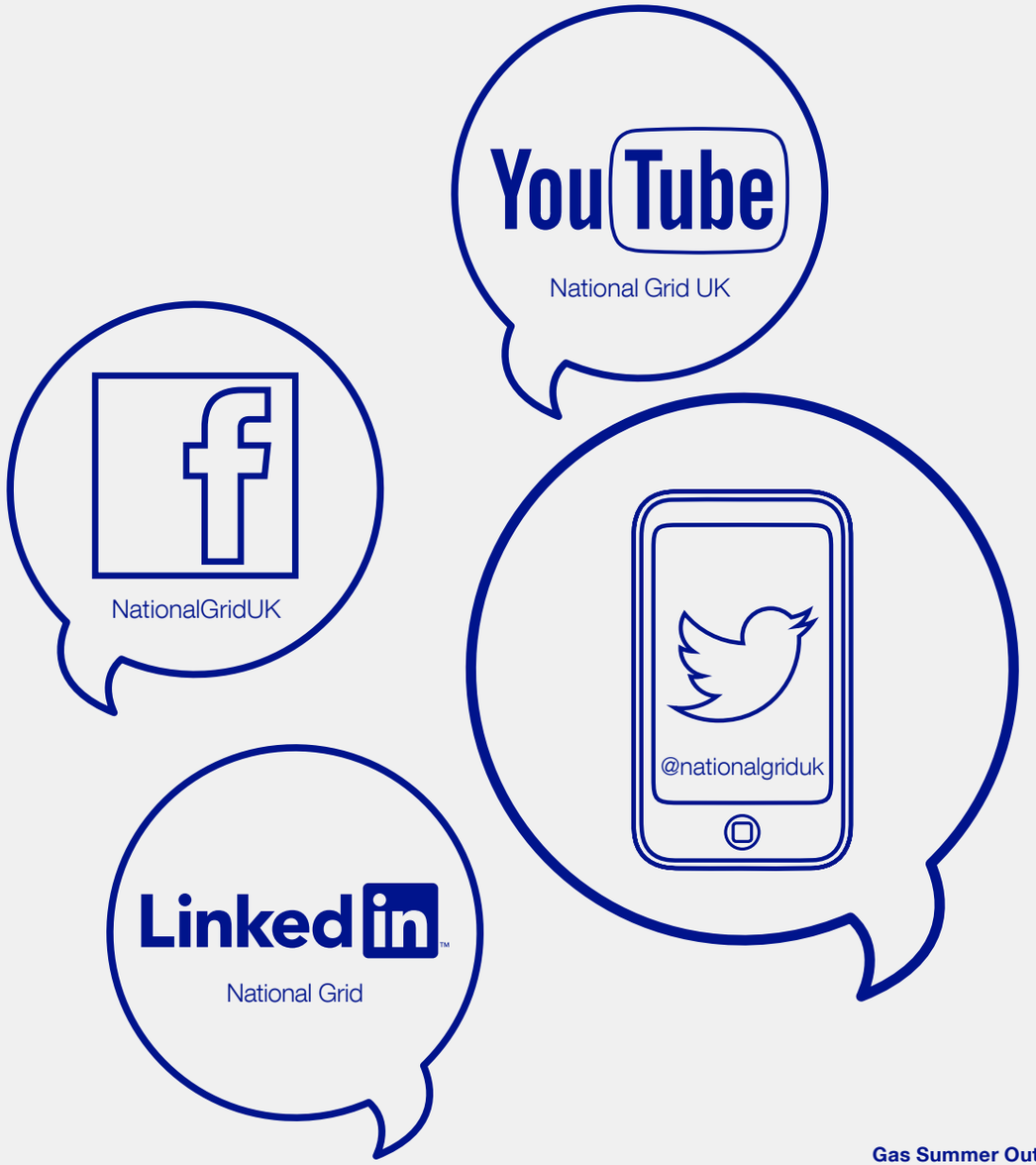
Table 1.6
Summer gas supply by source – historical (2016–2019) and forecast for 2021

(TWh)	2016	2017	2018	2019	2020 forecast[5]	2020 weather corrected actual	2021 forecast
UKCS	169.6	182.1	175.8	176.9	165.4	166.4	163.3
Norway	129.8	137.1	139.2	102.6	109.9	92.1	102.6
Continent	5.2	1.0	1.0	0.0	1.0	0.0	0.0
LNG	55.5	33.5	14.7	62.8	70.1	74.3	59.7
Storage	12.6	19.9	13.6	14.7	14.7	13.6	14.7
Total	**372.6**	**373.7**	**343.3**	**377.9**	**360.1**	**346.5**	**339.1**

[5] Data provided from Gas Summer Outlook 2020.

Continuing the conversation

Email us with your views on the Gas Summer Outlook at: .Box.OperationalLiaison@nationalgrid.com



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Glossary

BCM
Billion cubic metres.

BBL
A bi-directional gas pipeline running from Balgzand in the Netherlands to Bacton in the UK.

Compressors
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 predominately gas driven turbines that are in the process of being replaced with electric units.

Composite Weather Variable (CWV)
The Composite Weather Variable (CWV) is a single measure of daily weather in each LDZ and is a function of actual temperature, wind speed, effective temperature and seasonal normal effective temperature.

Daily metered (DM) demand
A classification of customers where gas meters are read daily. These are typically large-scale consumers.

IUK Interconnector/IUK
The Interconnector (UK) Limited is a bi-directional gas pipeline connecting Bacton in the UK and Zeebrugge in Belgium.

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.

Medium-range storage (MRS)
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 is a virtual trading location for the sale and 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.

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.

Glossary

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) where gas of a particularly low or high CV enters the distribution network which differs with the flow weighted average CV entering that network.

Renewables
Forms of energy generation from renewable resources, which are naturally replenished, such as sunlight and wind.

Seasonal normal
A set of conditions representing the average weather that we could reasonably expect to occur. We use industry-agreed seasonal normal weather conditions. These reflect recent changes in climate conditions, rather than being a simple average of historic weather.

Seasonal normal demand (SND)
The level of gas demand that would be expected on each day of the year. It is calculated using historically observed values that have been weighted to account for climate change.

Swing
Europe provides global gas supply flexibility during periods of the year when there is a surplus or shortage of LNG, making Europe the 'swing market'. During times when there is a shortage of LNG being produced, cargoes are diverted away from Europe, to meet demand in Asia and other regions where prices will be higher. In an oversupplied LNG market, European hubs absorb the surplus.

Storage injection
Gas for storage injection. This is gas which is put ('injected') into a gas storage facility.

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.

Withdrawal
Gas for storage withdrawal. This is gas which is taken from ('withdrawn') from a gas storage facility.