

# Exit Capacity Planning Guidance 2021 Final Outcomes Report

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# Executive Summary

In December 2020 Ofgem published their RIIO-2 Final Determinations for the transmission and gas distribution price controls. These set out the key elements of the price control from 1 April 2021 to 31 March 2026. This included a new licence obligation for the gas transporter licence holders to comply with an enhanced obligations framework in relation to the exit capacity booking process. Standard Special Licence Condition (“SSC”) A57 (Exit Capacity Planning) of the gas transporter licences requires the licence holder (“licensee”) to comply with the Exit Capacity Planning Guidance (“the Guidance”) which is available here: [Exit Capacity Planning Guidance](#)

The Guidance comprises a set of requirements relating to the following areas of capacity booking activity. However, in this initial year specific transition arrangements are in place to confirm a reduced set of requirements.

**Methodology:** GDNs must provide information on the structure of their networks known as Network Topology, and both GDNs and NGG must provide information on their forecasts of demand and the details of the processes in place to calculate these forecasts.

**Engagement:** The GDNs and NGG must collaboratively work with each other and with other stakeholders to maximise booking efficiency across the gas transportation network as a whole.

**Reporting:** licensees must report annually to the Authority on capacity booking methodology, stakeholder engagement, decision-making and data to demonstrate efficient booking outcomes.

The purpose of this document is to satisfy the requirement comprised within the Exit Capacity Planning Guidance (ECPG) document to report annually on capacity booking methodology, stakeholder engagement, decision-making and data to demonstrate efficient booking outcomes.

The report constitutes of three parts:

- Analysis – detailing the conclusions of the forecasting process, and the options identified to accommodate the scenario forecasts within each GDN’s network;
- Interaction with other networks – detailing the interaction between networks, and the consequences other networks have identified with the options each GDN has identified;
- Final outcomes – including the actual NTS exit capacity bookings derived, and a full explanation of the decisions made, with reference to the methodology statement.

If you have any queries or would like any further information, please contact our planning team:

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# Analysis

## Demand Forecast

To meet our license obligations, the National Transmission System (NTS) Exit Capacity that we book needs to be sufficient to ensure we are able to meet demand on a peak 1:20 winter day<sup>1</sup>. Every Gas Year (1st October to 30th September), we are required to book Exit Capacity from the NTS for each of our 23 offtakes.

Under the Gas Transporter Licence Standard Special Condition A9 Northern Gas Networks has an obligation to demonstrate its ability to meet our 1:20 Peak Day Demand<sup>1</sup>, this approach pursues full compliance with regards to that obligation. Northern Gas Networks (NGN) will book capacity as efficiently as possible ensuring we remain compliant with the 1-in-20 licence obligation.

On an annual basis, National Grid ESO (NG-ESO) publish their Future Energy Scenarios (FES) which outline four different pathways for the future of energy between now and 2050. Each one considers how much energy we might need and where it could come from. The intention of FES is that they can be used to inform a range of energy system activities including network operation, investment decisions and energy policy.

The four Future Energy Scenarios are;

- Leading the Way
- System Transformation
- Consumer Transformation
- Steady Progression

For the third year, along with the Future Energy Scenarios, NG-ESO have provided a Central Forecast which depicts the most likely progress for each sector, given the known political, economic, social and technological situation and outlook. This forecast shows sustained growth consistent with the Steady Progression scenario mentioned above. NGN uses the NG-ESO FES Steady Progression and Central Forecast for reference against our internally produced peak day and annual demand forecasts.

NGN use the same simulation methodology as National Grid by using historical weather data back to 1st October 1960 to get a full and representative range of weather. This generates the statistical distribution of possible demands to derive the level of demand we would only expect to exceed once in every 20 years. It's important to note our forecasts aren't based on a set of scenarios. Instead, our forecasts use various inputs to arrive at a set of potential outcomes and from these outcomes we select the most appropriate one for the planning period.

NGN take an additional step of adjusting peaks for day of the week and holiday periods as peaks are most likely to fall on working weekdays when demand will typically be 2-5% higher than the level generated by the statistical distribution. This approach results in slightly higher peak forecasts than NG-ESO produce. Our approach to make peak adjustments on this basis were tested and validated during

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<sup>1</sup> 1:20 peak day demand is the level of daily demand that, in a long series of winters, with connected load held at the levels appropriate to the winter in question, would be exceeded in one out of 20 winters, with each winter counted only once. This is the UNC definition of the 1:20 peak day. It can be found in section W2.6.4(c). [Uniform network Code – General terms Section C](#)

the 'Beast from the East' on 1st March 2018, as our forecast accuracy was calculated to be 97% for Northern LDZ and 100% for North East LDZ.

The forecast for the 1:20 peak day must be derived for each year of the 10-year forecast period. To forecast 10 years ahead a 3-year moving average was used in 2021. The adjusted peak estimates for the years 2018/19, 2019/20 & 2020/21 were used to form the averages. This approach ensures that weather is the sole driver of peak demand.

As a result, the overall trend on each network is as follows:

- Northern**  
 Peak forecasts are above the highest recent observed peak demand of the 1st March 2018, 4.9% above for Gas Year 2021/22. The reason for the increase in year 1 is predominantly down to general growth in the LDZ.
- North East**  
 Peak forecasts are above the highest recent observed peak demand of the 1st March 2018, 4.3% above for Gas Year 2021/22. As with the Northern LDZ. The reason for the increase in year 1 is predominantly down to general growth in the LDZ.

The below tables outline our peak day forecast, the expected consumption down the demand curve and future years.

LDZ	2020/21 Peak Day Forecast (mcm/d)	2021/22 Peak Day Forecast (mcm/d)	% Difference from 2020/21 Peak day Forecast
<b>North</b>	19.87	19.85	-0.1%
<b>North East</b>	23.71	23.80	0.4%
<b>Total</b>	<b>43.58</b>	<b>43.65</b>	<b>0.2%</b>

Table 1 - This year -v- last year

This table denotes the supply and demand profiles from five demand days across the annual forecast NGN demand curve (Peak, D13, D46, D150 and D300).

Yr 1	North	North East
<b>Pk</b>	20.77	24.49
<b>D13</b>	17.94	20.96
<b>D46</b>	13.47	15.95
<b>D150</b>	9.93	11.37
<b>D300</b>	5.29	5.35

Table 2 – This year down the Demand Curve

Pk Demand	North	North East
Yr 2	20.77	24.41
Yr 3	20.78	24.44
Yr 4	20.77	24.44
Yr 5	20.77	24.43
Yr 6	20.78	24.43

Table 3 - Future years

## Exit Capacity – Flat

To meet our 1:20 peak day obligation we use a combination of Enduring and Annual capacity products for years 1, 2 and 3 to ensure we have sufficient capacity allocated to meet the forecast demand outlined in the previous section of this report. NGN do not utilise Daily capacity products due to the risk that they may not be available in the event of an NTS constraint. The level of Enduring capacity plus our Annual capacity bookings enable us to meet the peak pay requirement in both of our LDZs.

Demand at an offtake fluctuates year on year and an assessment is made about where, and if any changes can be made to our bookings. The assessment considers.

- The reason for a increase or Decrease – for example: year on year growth, changes to the offtake or network
- The balance of capacity across the offtakes within the LDZ
- Availability of Unsold Capacity up to Baseline
- The highest demand seen through the offtake in recent years
- User commitment

Each offtake is looked at on an individual basis, with consideration given to the implications of booking at both the Annual and Enduring level. This is approach is to ensure NGN books capacity with the utmost efficiency where possible.

### Options identified

#### Northern LDZ

As forecasts of peak day have not significantly changed since last year the overall capacity change requirement for our Northern LDZ is minimal. The largest change was the requirement for additional Enduring capacity at a Northern LDZ offtake following system reinforcement for our Cumbria region, but this increase has been offset with a reduction at another Northern LDZ offtake, making overall Northern LDZ capacity aligned to last year’s bookings.

As with our North East LDZ, we submitted an ‘ideal’ booking scenario for our Northern LDZ for analysis. As we have User Commitment on 5 of our offtakes from previous bookings, this scenario demonstrated where we would ‘swap’ capacity within the LDZ to improve offtake allocation accuracy.

NGG analysed this scenario but deemed it to be unacceptable due to the current rules around User Commitment and Substitution outlined in the Exit Capacity Methodology. The benefit of providing this additional scenario has reinforced discussion points in the Capacity Access Review.

## North East LDZ

As forecasts of peak day have not significantly changed since last year the overall capacity change requirement for our North East LDZ is minimal.

Following discussions with NGG representatives present at Modification 0705 (Capacity Access Review) and members of the NGG capacity team, we submitted an additional scenario for sensitivity analysis to NGG as part of the Exit Capacity Planning Guidance section 3.5. This posed an additional 'ideal' booking scenario which would see us 'swap' capacity within the LDZ to improve allocation accuracy at each individual offtake.

NGG analysed this scenario but deemed it to be unacceptable due to the current rules around User Commitment and Substitution outlined in the Exit Capacity Methodology. The benefit of providing this additional scenario has reinforced discussion points in the Capacity Access Review.

## Exit Capacity – Flex

'Flex' relates to the amount of storage (linepack) we expect to use on a 1:20 peak day. Our storage simulation model, CONSUS, determines the storage requirement at an LDZ level and then our planning models determine the volume of flex required at each of our offtakes. In addition to the modelling, NGN carry out analysis of actual SCADA data to ensure our bookings and Control Room operating strategy are aligned.

In 2021 Flex Capacity applications were made to allow us to match forecast storage requirements at each offtake.

Where changes have been made from the previous year, this is due to small year on year changes to the flex modelling outputs. Further analysis is undertaken at each offtake to calculate whether Flex capacity breaches would have occurred at the new modelled output level. If a significant number of breaches would have occurred, then the booking level will be adjusted upwards to match the output. Whilst breaches aren't financially punitive, we still aim to align our bookings, models, and operating strategy as closely as possible.

North	Topology	Flex Capacity 2020/21 (mcm/d)	Flex Capacity 2021/22 (mcm/d )	% Difference
		<p style="text-align: center;"><b>This information has been redacted due to its sensitivity in line with BEIS and the CPNI general principles of security around its wider disclosure</b></p>		
<b>OFFTAKE TOTAL</b>				

Table 4 – Flex - This year -v- last year (Northern LDZ)

North East	Topology	Flex Capacity 2020/21 (mcm/d)	Flex Capacity 2021/22 (mcm/d )	% Difference
		<p style="text-align: center;"><b>This information has been redacted due to its sensitivity in line with BEIS and the CPNI general principles of security around its wider disclosure</b></p>		
<b>OFFTAKE TOTAL</b>				

Table 5 - Flex - This year -v- last year (North East LDZ)

## Assured Pressures

In accordance with section J2.5 of the Uniform Network Code NGG has an opportunity to ask for a permanent reduction in Assured Offtake Pressures at Distribution Network Offtakes with effect from October of the following Gas Year. In 2021, NGG requested permanent Start of Day pressure reductions at two North East LDZ offtakes and one Northern LDZ offtake. Off-peak reductions were also requested at the same Northern LDZ offtake.

Network analysis using PRISM deemed the requested permanent reductions to be unacceptable however NGN have accepted the off-peak reduction on a temporary basis.

# Interaction with other networks

There is one inter-LDZ transfer to the SGN network from our Northern LDZ. There is no control over the transfer and the flow is not treated as an inter-LDZ transfer on our Control Room SCADA system as the volume is small. There is no impact on Exit Capacity planning.

## Final Outcomes

### Exit Capacity – Flat Capacity changes in 2021

#### Northern LDZ

During the Exit Capacity application window, we made an application for one Enduring decrease at a Northern LDZ offtake. The Northern LDZ offtake Flat capacity reduction was to reduce excess capacity above the 1:20 forecast level following the cessation of User Commitment.

We have made one Annual increase at one Northern LDZ offtake in order to reinforce supplies to the Cumbria region. We will revalidate the model in 2022 with actual flow data to inform an Enduring booking.

We also made one small Annual increase at another Northern LDZ offtake for Yr1. The minimum quantity of 100,000 kwh/day was booked to cover a small increase in local demand of 53,487 kwh/day.

All 3 Northern LDZ capacity changes were accepted and subsequently allocated by NGG.

North	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Forecast	19.85	19.85	19.85	19.85	19.85	19.85
Booking	21.44	21.36	21.36	21.36	21.36	21.36

Table 6 - Peak Day Forecast -v- Booking (Northern LDZ)

#### North East LDZ

No changes to the previous 2020 flat capacity bookings were made in the 2021 Exit Capacity application window.

North East	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Forecast	23.84	23.75	23.78	23.79	23.77	23.78
Booking	24.76	24.76	24.76	24.76	24.76	24.76

Table 7 - Peak Day Forecast -v- Booking (North East LDZ)

For both LDZs we are compliant with Standard Special Licence Condition (“SSC”) A57 (Exit Capacity Planning) of the gas transporter licence and Standard Special Condition A9, and as outlined above 1 have mitigated the associated risk of insufficient capacity for a peak day.

For all years our 1:20 bookings are in line with our Peak Day forecast and therefore we have met the requirements of the ECPG. Discrepancies between the 2 are either due to modelling factors, such as linepacking or rounding, the restriction on the minimum change that is possible to existing bookings or due to user commitment.

#### Exit Capacity - Flex Capacity changes in 2021

Changes to our Flex Capacity bookings were minimal in 2021, due to small year on year changes to the flex modelling outputs.

#### Assured Pressure bookings in 2021

In our 2021 process there has been no requirement for us to request increases in our Assured Start of Day or End of Day pressures. NGG requests for permanent pressure reductions have been denied by NGN, but an off-peak pressure reduction request at one Northern LDZ offtake has been accepted by NGN on a one-year basis.

## Appendix 1 – Year 1 Flat & Flex

North - 2021/22	Topology	1:20 peak day		Day 13		Day 46		Day 150		Day 300	
		Flat Booking mcm/d	Flex Booking mcm/d	Flat mcm/d	Flex mcm/d	Flat mcm/d	Flex mcm/d	Flat mcm/d	Flex mcm/d	Flat mcm/d	Flex mcm/d
		<p style="text-align: center;"><b>This information has been redacted due to its sensitivity in line with BEIS and the CPNI general principles of security around its wider disclosure</b></p>									
<b>OFFTAKE TOTAL</b>											

Table 8 - Year 1 Flat and Flex (Northern LDZ)

North East - 2021/22	Topology	1:20 peak day		Day 13		Day 46		Day 150		Day 300	
		Flat Booking mcm/d	Flex Booking mcm/d	Flat mcm/d	Flex mcm/d	Flat mcm/d	Flex mcm/d	Flat mcm/d	Flex mcm/d	Flat mcm/d	Flex mcm/d
		<p style="text-align: center;"><b>This information has been redacted due to its sensitivity in line with BEIS and the CPNI general principles of security around its wider disclosure</b></p>									
<b>OFFTAKE TOTAL</b>											

Table 9 - Year 1 Flat and Flex (North East LDZ)

## Appendix 2 – Years 2 - 6 Flat & Flex

North - 1 in 20 Peak	Topology	Year 2		Year 3		Year 4		Year 5		Year 6	
		Flat Booking mcm/d	Flex Booking mcm/d	Flat mcm/d	Flex mcm/d						
		<p style="text-align: center;"><b>This information has been redacted due to its sensitivity in line with BEIS and the CPNI general principles of security around its wider disclosure</b></p>									
<b>OFFTAKE TOTAL</b>											

Table 10 - Flat and Flex for Years 2-6 (Northern LDZ)

North East - 1 in 20 Peak	Topology	Year 2		Year 3		Year 4		Year 5		Year 6	
		Flat Booking mcm/d	Flex Booking mcm/d	Flat mcm/d	Flex mcm/d						
		<p style="text-align: center;"><b>This information has been redacted due to its sensitivity in line with BEIS and the CPNI general principles of security around its wider disclosure</b></p>									
<b>OFFTAKE TOTAL</b>											

Table 11 - Flat and Flex for Years 2-6 (North East LDZ)





Northern  
Gas Networks

we are  
the **network**