Northern Gas Networks

Long Term Development Statement

2025

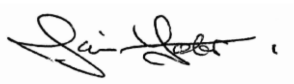
Foreword

Welcome to our Long Term Development Statement 2025. This document provides essential information on the process for planning the development of the gas distribution system, which includes demand and supply forecasts, system reinforcement projects and associated investment. We publish the report at the end of our 2025 planning process for our two Local Distribution Zones, the North East and Northern. The main body of the document provides an overview of the key topics, with further details contained in the appendices.

At the time of publishing this report we are halfway through our fifth year of our RIIO-GD2 price control period and working hard to meet our license requirements and outperform our targets. The past twelve months has seen a steady recovery in demand but the increased cost of living continues to have an impact even as inflation has eased. This will have impacted the typical upturn of demand through the winter of 2024/25.

As the RIIO-GD2 regulatory period comes close to its end, innovation remains more important than ever in supporting delivery of our overarching objectives: provide a safe, reliable gas service; support the transition to net zero; continue to modernise our operations and provide help to our vulnerable customers, ultimately creating a fairer, greener future for the North of England.

We are proud of all these achievements as we continually seek to further improve the service we provide to today's customers and plan to deliver a net zero future.



Iain Foster

Director of Engineering

Version & Circulation

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This document, and any updates to this document will be circulated electronically and uploaded to our website.

Disclaimer

The Long-Term Development Statement is the product of an annual cycle of planning and analysis. The statement sets out our assessment of future supply and demand for natural gas on our network. It also outlines proposals for investment in our local transmission and distribution systems. Interested parties may use this information to gain an understanding of how we expect gas demand to evolve on our networks over the next 10 years. This will help them plan accordingly when considering connection opportunities.

We are required to publish this annual statement in accordance with Standard Special Condition D3 of our Gas Transporters Licence and Section 4.1 of the Uniform Network Code Transportation Principal Document.

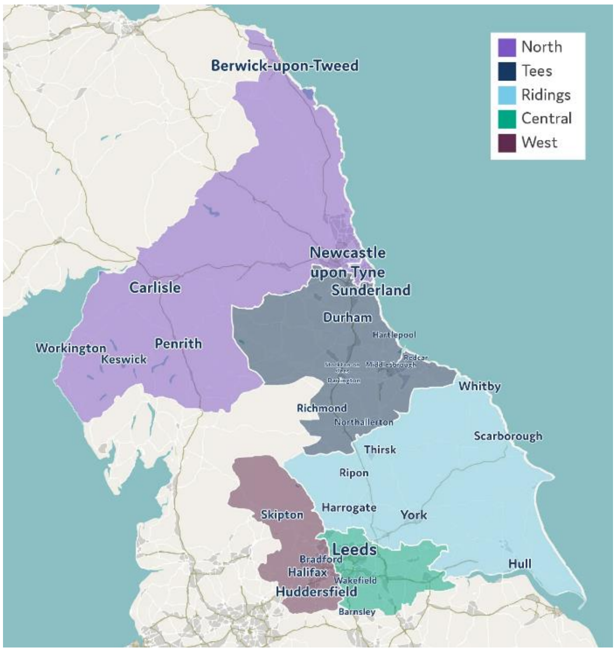
This document is not intended to have any legal force or to imply any legal obligations regarding capacity planning, future investment and resulting capacity.

About NGN

Our mission is to provide a safe, dependable, and cost-effective service to our customers and stakeholders while developing new technologies to deliver low carbon energy.

Innovation and collaboration are at the core of everything we do, and we constantly strive to push boundaries, improve our services, and deliver exceptional outcomes.

From ensuring the gas network runs efficiently, to developing new low-carbon energy solutions and helping our priority customers to stay safe and warm at home, we work with our stakeholders and communities to achieve maximum impact.



2.9m

Heating 2.9 million homes in our region

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Chapter 1

Demand

we are the network

1.1 Demand Forecasts Overview

This chapter outlines the ten-year gas demand forecast for each Local Distribution Zone (LDZ) within NGN, including both the annual and 1 in 20 Peak Day gas demands. It also includes discussion on how current forecasts relate to previously published forecasts. Further information is provided in Appendix 2. Demand forecasts are prepared as part of an exchange of information that is intended to inform respective capacity planning processes between the Gas Distribution Networks and National Gas. These forecasts are compliant with the demand forecasting requirements of Section H of the Uniform Network Code (UNC) Offtake Arrangements Document.

1.2 Demand Forecasts

1.2.1 Annual Demand

This section provides an outline of our latest annual gas demand forecasts up to and including gas year 2034/35 along with the key underlying assumptions. A more detailed view can be found in Appendix 2.

Annual demand forecasts are produced using 'weather corrected demand'. Weather corrected demand removes the impact of variations in weather between years, so years can be compared and forecast for on a like for like basis. Xoserve run the weather correction process on behalf of all Gas Distribution Networks.

The annual demand forecasts are based on analysis of how historic weather corrected demand is influenced by non-weather factors such as the economy, environmental and efficiency initiatives and how the most influential factors are likely to change in the future. Evidence suggests that the most influential factor that determines gas demand annually, after weather, is its price. The largest single components of customer bills are gas and electricity wholesale prices.

Annual Domestic Demand

In our network, domestic demand accounts for the majority of our demand. It has been impacted most by gas prices and other cost of living factors. It has changed considerably (since the cost of living crisis began in 2021) as a result of high variations in both. Between 2021 and 2023 it reduced by 15% and recovered by 6% in 2024 as these pressures have started to ease. Almost of all of this change has been due to comfort levels, as households have adjusted the amount they heat their houses, based on what they can afford.

Our forecast for gas prices and other inflationary pressures on households is of both decreasing gradually and easing economic pressures over the next few years. This results in comfort levels returning to pre cost of living levels (of 2021) in 2028 in both LDZs. Comfort levels are forecast to increase very slightly above this post 2028 in both LDZs. Comfort levels are forecast by econometric forecasting, whereas other factors are forecast individually based on recent trends and existing policy and legislation.

These factors include the following:

- Energy efficiency from improving boiler efficiency, heating controls and some extra insulation in existing houses, reduce demand by 6.5 % in the next 10 years.
- The switch to renewable heating has increased since the BUS (Boiler Upgrade Scheme) incentive was increased to £7,500 in October 2023 but its impact is forecast to still be low, reducing gas demand by 1.4% on average across our networks in our forecast in the next ten years.
- The impact of new houses connecting to our networks is forecast to add 4.0% to gas demand in the next ten years. The impact of FHS (Future Homes Standard) is not included in our forecasts as it has not yet been legislated. If it were to become legislation, it would be included in the forecast and would lessen the impact of new houses

The result of all of this is most of our domestic demand forecast is about recovery from the cost of living crisis, with lesser influence from other factors. This results in domestic demand being 3.0% below 2021 levels in Northern LDZ in 2034 and 0.1% in North East LDZ in 2034.

Annual Non domestic demand

Non domestic demand has been impacted by gas price variations but less than the domestic sector. Most of this demand is forecast via econometric forecasting, although our largest site's demands are forecast individually.

Non domestic demand has also changed considerably due to inflationary pressures and gas prices since 2021, reducing 13% between 2021 and 2023. Falling gas prices in 2024 and an improving economy increased demand in 2024 to be 9% below 2021 levels. Our forecast for generally reducing gas prices and improvements in the economy shows a steady rise in gas demand in these sectors to be 3 % below 2021 levels by the end of the forecast period.

Our forecast remains below 2021 levels for this sector, as the economic growth (forecast from OBR) improves but is limited and gas prices are forecast to remain still slightly above 2021 levels at the end of the forecast period. We have also seen some of our largest sites reduce demand, and do not anticipate this all to return.

Annual Demand - In Summary

All our forecasts are slightly lower this year than last, as our gas price forecast is a little higher than last year and economic forecast from the OBR are a little less optimistic than last year. Our annual demand is forecast to be 2.2% lower than last year in 2033 (the last year that can be directly compared).

Load Band	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
0-73 MWh	35.8	36.5	37.6	39.2	39.4	39.1	39.2	39.2	39.3	39.4
73-732 MWh	4.9	5.0	5.1	5.2	5.3	5.4	5.4	5.4	5.4	5.4
732-5860 MWh	3.7	3.7	3.7	3.8	3.8	3.8	3.9	3.9	3.9	4.0
Small User	44.4	45.3	46.4	48.2	48.5	48.3	48.4	48.5	48.7	48.8
Firm> 5860 MWh	18.6	18.6	18.5	19.1	19.2	19.2	19.2	19.3	19.3	19.4
NGN Consumption	62.9	63.8	65.0	67.4	67.7	67.5	67.6	67.8	68.0	68.2
NGN Shrinkage	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
NGN Demand	63.2	64.1	65.2	66.9	67.3	67.5	67.7	67.9	68.2	68.5

Table 1.2.1 NGN's forecast annual demand by load category & calendar year (in TWh)
Note: Figures may not sum exactly due to rounding.

The chart below illustrates the actual annual throughput and our most recent forecasts through to the end of our RIIO GD3 price control[1] period.

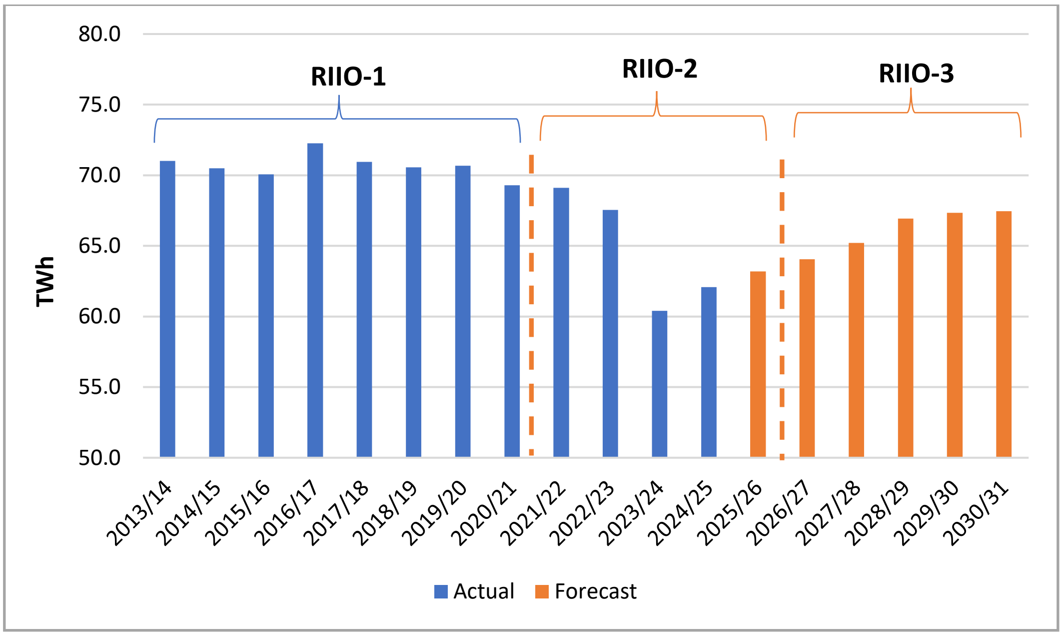

Figure 1.2.2 RIIO1/2 historic annual demand and forecast RIIO 2 & 3 Annual demand

1.2.2 Forecast Accuracy

Table 1.2.3 below provides a comparison of actual and weather corrected throughput during the 2024 calendar year with the forecast demands presented in our 2024 plan. Annual forecast demands are presented in the format of consumption load bands/categories, consistent with the basis of system design and operation.

Load Band	Actual 2024	Weather Corrected 2024	Forecast for 2024	Weather Corrected v Forecast (%)
0-73 MWh	30.74	33.25	38.53	-13.7
73 – 732 MWh	4.48	4.75	5.21	-8.8
>732 MWh	20.85	21.20	24.34	-12.9
Network Shrinkage	0.26	0.26	0.28	-4.5
NGN Network Total	57.49	62.08	68.35	-9.2

Table 1.2.3 Comparison of actual and weather corrected throughput in 2024 calendar year (TWh)
Note: Figures may not sum exactly due to rounding.

On a Network basis, the weather corrected annual throughput in 2024 was 62.08 TWh. This shows a decrease of -3.2% from the 2024 forecast.

[1] RIIO GD3 Price Control RIIO-3 Draft Determinations for the Electricity Transmission, Gas Distribution and Gas Transmission sectors | Ofgem

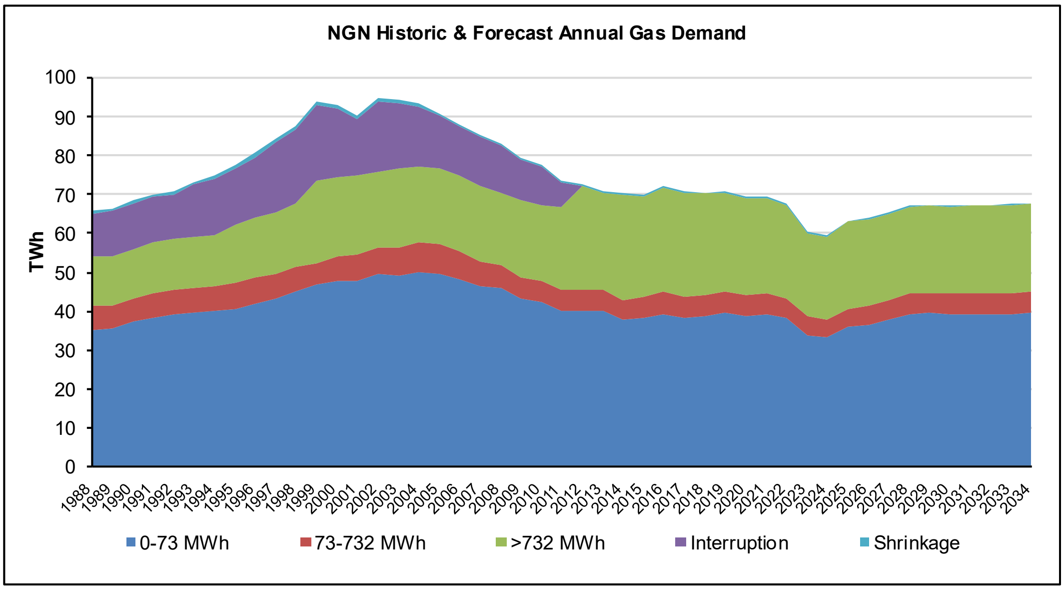

Figure 1.2.4 Historical Weather Corrected Throughput & Forecast Annual Gas Demand by Load Band

The chart above shows weather corrected and forecast gas demand by load band through to 2034. The most significant change in this chart is the change in the Interruptible load in 2011. Following a modification in UNC Interruption Arrangements (Mod 90), which came into effect 01 October 2011, interruptible contracts were only made available at specific supply points where NGN had identified an area in which interruption was necessary. This change to the Interruption process resulted in a significant reduction in Interruptible Load.

1.2.3 Peak Forecast Demand

NGN is required to forecast 1 in 20 Peak day demand on an annual basis. We maintain and operate our network to be able to satisfy this level of demand, as defined in Uniform Network Code section W2.6.4(c):

1 in 20 Peak day demand - 1 in 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.

Peak demand is calculated using an established industry methodology[2] and is based on determining the weather-demand relationship for each loadband in each LDZ. Smaller loadbands, which tend to represent households and smaller businesses, are much more weather sensitive than larger loadbands. This is because they tend to use most of their gas for space heating rather than industrial processes which aren't linked to weather.

The forecast 1 in 20 peak day demand in the 2025/26 gas year is 0.2% lower than the forecast made in 2024. Overall, peak demand is forecast to decrease by 0.80% over the 10-year period within our Northern LDZ and 0.01% in our North East LDZ.

This compares with an increase of 0.12% and 0.04% respectively, for these LDZs in the 2024 forecast. As we move into the winter of 2025/26, we are gaining a better understanding of the impact of the large increase in the gas prices, which reached record levels in 2022, and have since reduced, but remain considerably higher

[2] Further information can be found here: https://www.nationalgas.com/our-businesses/system-operation/capabilities-and-methodologies

than seen prior to 2021. We have seen they have had a higher impact on gas demand in the domestic compared to the non domestic sectors.

In the domestic sector, there have been two main factors influencing demand.

Since the cost of living crisis began in 2022, we have seen daily demands become more sensitive to weather especially at lower temperatures. This offsets some of the reduction in annual demands, and is the reason for our assumption to remove behaviour change due to the cost of living from our domestic peak demand assessment. The assumption underlying this in our current forecast is that at times of really low temperatures, the requirement to stay warm would override the requirement to save money. Whilst the temperature has not been low enough to fully test this, the increased weather sensitivity observed in cold conditions corroborates the assumption in our forecast that as weather gets colder there is a greater cold weather upturn. This is why we have removed behaviour change that exists due to increased cost of living in our annual forecast, from our peak forecast. This assumption becomes less prevalent after the first few years of the forecast, as the impacts of the cost of living crisis become less relevant in the forecast; with our LDZs forecast to return to the 2021 comfort levels around 2028.

The following table summarises our 1 in 20 peak day forecasts for the period 2025/26 to 2034/35. These are the forecasts for each gas year covering the period 1st October to 30th September.

LDZ	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35
North	222	219	220	220	220	220	220	220	220	220
North East	261	260	261	261	261	261	261	261	261	261
Total	482	479	481	481	480	481	481	480	481	480

Table 1.2.5 Forecast 1 in 20 Peak day Firm Demands by LDZ from the 2025 Demand Statements (GWh)
Note: *Figures may not sum exactly due to rounding*

The chart below illustrates the historic peak day demands from RIIO GD1/GD2, and the RIIO GD2 and RIIO GD3 forecasts. Prior to GD1 the highest demand in recent years was seen in the winter of 2010/11.

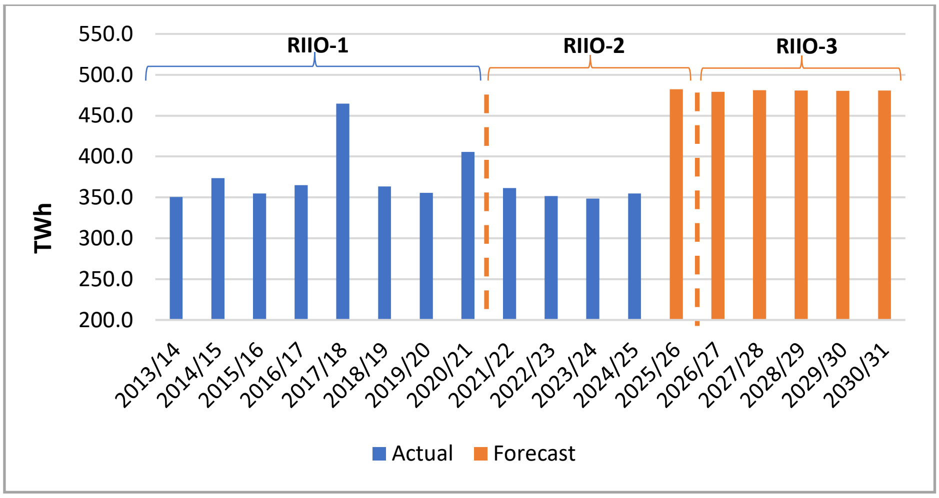

Figure 1.2.6 Historic Peak day Demand Actuals and RIIO 2 & 3 forecasts (GWh)

Comparisons with NESO FES

National Energy System Operator (NESO) carry out Future Energy Scenarios (FES) for both transmission and distribution networks. FES 2025 was presented to us in July and will stand as a document for the next 3 years. The next FES will be produced in 2028. This year three potential future pathways to achieve net zero were outlined as well as a Falling Behind scenario and Ten Year Forecast. FES considers future energy supply (electricity, gas hydrogen) and demand (residential, transport, industrial and commercial) up to 2050. Each pathway considers how much energy we might need and where it could come from. We analyse these pathways against the ones produced last year to understand how NESO drivers are changing. The pathways are dependent on factors such as policy surrounding the decarbonisation of heat, the state of the economy, societies willingness to change, infrastructure and energy supply changes and advancements in technology.

FES 2025 will be used to form the basis of upcoming RESP (Regional Energy Strategic Planning)[3] which will ultimately feed into the CSNP (Centralised Strategic Network Plan)[4] which is intended to inform effective energy network planning. This is to best enable energy networks' design for a Net Zero energy system, and enable some pre-emptive electricity network upgrades to facilitate Net zero at best cost.

Many of the key policies assumed in FES are yet to be announced or legislated, and hence this is a key differentiating factor between FES and our forecast, which is based on legislated policy to ensure security of supply. NESO may apply diversity so that the national generation figure reflects national requirements whereas the distribution network will book sufficient capacity for our large loads to operate at a 1:20 in line with their capacity bookings, without making assumptions about which loads NESO would call into operation. NESO also assumes behaviour changes in energy use and consumers' technology choices, which we are yet to be seen, and so incorporates optimistic changes in their pathways which would be required to achieve net zero. This is very significant for some key factors, most notably heat pump uptake, where their pathways have a much higher heat pump uptake than has been seen, or is budgeted for in current energy legislation.

NGN has concerns that as only Net Zero pathways will be used for RESP and underly CSNP, this process will take into account some changes in the energy landscape occurring faster than reality. This is especially pertinent to heating. This would result in a lower gas demand incorporated into this planning process than reality. As gas networks provide essential security of energy supply, especially for heat, there could be a risk of under investment in gas networks as a result, potentially risking security of supply.

More information can be found at https://www.neso.energy/publications/future-energy-scenarios-fes/

Impact assessments will continue to be undertaken and form part of the future NGN forecasts and FES outcomes.

[3] https://www.neso.energy/what-we-do/strategic-planning/regional-energy-strategic-planning-resp

[4] https://www.neso.energy/what-we-do/strategic-planning/centralised-strategic-network-plan-csnp

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Chapter 2

Supply and storage

Chapter 2 - Supply & Storage

2.1 Supply

Gas is predominantly brought into our network through offtakes connected to the National Transmission System (NTS). Offtakes are above ground installations (AGIs) that connect the NTS to NGN's Local Transmission System (LTS). NGN's offtakes can operate to an inlet pressure of up to 85bar. From the offtake, gas then passes through the Local Transmission System, into the Distribution System and then onward to consumers.

We develop the network to meet our customers' requirements. National Gas will also develop the NTS in line with supply and demand forecasts, provided by us and used in conjunction with their own demand forecasts of network demand. The National Gas Ten Year Statement can be found on their website[5].

The amount of gas NGN requires to satisfy its 1 in 20 peak day demand commitment is secured from National Gas on an annual basis via an offtake capacity booking process. This process involves our network modelling team using the 1 in 20 forecasts at the Local Distribution Zone (LDZ) level to derive a booking quantity at each of our offtakes to satisfy demand at the local level. NGN then request a daily energy quantity and a volume of storage for each of the offtakes. We also indicate the peak hourly flow and associated minimum inlet pressure required. Following discussion between the two parties, National Gas will allocate the capacity and our Control Room will operate the system accordingly.

Over the course of RIIO GD2 we have optimised our capacity bookings to 1 in 20 peak day forecast levels. Historically, capacity was held at levels that were in excess of current demand levels, mainly due to demand levels being higher in the past. In order to reduce our customer bills and free-up capacity on the National Transmission System for other users, we have made significant changes to reduce and optimise our bookings at each of our offtakes. We comply with the Exit Capacity Planning Guidance which is available here: **Exit Capacity Planning Guidance**, and NGN's Exit Capacity Planning Guidance can be found on NGN's Document Library online, in the Safe & Reliable section: **Document Library**.

2.2 Distributed Network Entry

We are committed to enabling the connection of biomethane and other low carbon gases to our network to support the transition to a flexible, low carbon energy system and enable net zero by 2050. We currently have 19 biomethane sites connected to our network which met the heating needs of over 58,000 homes during the 2024/25 regulatory period. We have a further 6 sites with reserved capacity, looking to connect over the next few years.

It is of note that the development of new biomethane sites is significantly influenced by the availability of government subsidies / incentives. The Green Gas Support Scheme (GGSS), which launched in autumn 2021 will be open to applications until March 2028.

We continue to regularly engage with our connected biomethane production sites as part of business as usual and work closely with producers to enable them to maximise their gas injection volumes and minimise down time.

We are actively involved the Gas Entry Customer Technical Working Group (GECTWG), Green Gas Technical Forum and the GB Green Gas Taskforce The purpose of these groups is to drive standardisation, streamlining and continuous improvement of the connections process across the GDNs and thereby improve outcomes for

[5]https://www.nationalgas.com/insight-and-innovation/gas-ten-year-statement-gtys

producers. We are confident in our mature connections process but see value in promoting knowledge and best practice sharing between GDNs to the benefit of potential connections customers.

We are also still receiving a healthy number of requests for detailed analysis relating to available injection capacity in areas of our network, with a handful of enquires reaching the connection reservation stage. We hope to see some of these projects move forward to build and commissioning in the coming years.

2.3 Storage in the Network

2.3.1 Linepack

The compressibility of natural gas allows the use of linepack to compensate for fluctuations of gas demand. Linepack refers to the volume of gas that can be 'stored' in the gas pipeline during periods of low demand when the pressure in the system is lower. When demand increases this stored gas can be released to ensure supply to consumers. Linepack is of strategic importance to NGN in the absence of physical storage vessels such as gas holders.

3

Chapter 3

Investment in the Distribution Networks

we are the network

Chapter 3 - Investment in the Distribution Networks

The Local Transmission System is designed to transport gas across our network and store it for the purposes of satisfying the 1 in 20 peak day forecast demands. The system is developed, based on demand and supply forecasts, to ensure that this capability is maintained.

We will continue to develop and invest in our networks to operate a safe and efficient network and to meet current and future customers' requirements and operating behaviours.

3.1 Below 7barg Distribution System

The NGN below 7barg system is designed to operate between levels of pressure defined by statute, regulation and safe working practices.

We also continue to invest in the replacement of our transportation network assets, primarily for the renewal of mains and services within Distribution systems. This includes expenditure associated with decommissioning of mains and services to a programme agreed with the Health and Safety Executive. This covers the decommissioning of all smaller-diameter iron gas pipes (Tier 1: 8 inches and below) within 30 metres of occupied buildings before December 2032, and the progressive decommissioning of larger iron pipes based on their risk and condition.

Mains Workload (km)	21/22	22/23	23/24	24/25	25/26	TOTAL	ALLOWED
Tier 1	437.7	430.7	469.7	447.8	421.9	2,207.8	2,144.3
Tier 2a	3.2	1.6	0.8	0.5	2.0	8.2	10.1
Tier 2b	19.1	17.7	24.6	22.1	19.7	103.1	102.0
Tier 3	5.3	5.4	5.5	5.7	5.6	27.5	22.7
Iron Mains (ex. >30m)	464.9	455.0	500.5	476.0	449.3	2,346.6	2,279.2
Steel <2"	45.4	33.0	36.0	41.1	44.0	199.5	218.9
Other	35.8	31.0	40.2	41.8	43.6	192.4	189.8
Diversions	11.1	9.4	13.2	6.0	13.3	53.1	56.6
Total	557.3	528.4	590.0	565.0	550.2	2,791.4	2,744.4

This year we have delivered a total of 565.0 km of mains abandonment.

The **Tier 1 Mains** target is 2,144.3km over RIIO-2, or 428.9km per annum. Over RIIO-2 we plan on delivering 2,186.8km, or 437.4km per annum. This is an increase of 8.5km each year, 42.5km over the 5 years, which allows recovery of the Covid-19 related workload shortfall seen in the final year of RIIO-GD1. Furthermore, the additional workload will provide a buffer on delivery as we enter RIIO-GD3. Over RIIO-GD2 we plan on delivering 2,207.8km, 63.5km more than our regulatory target. The increase workload will be funded under the Tier 1 Mains volume driver.

Tier 2a Mains are also subject to a volume driver as the workload is very difficult to predict. We expect to deliver 8.2km over RIIO-2.

We are on track to deliver the allowed workload for **Tier 2b** and >**2" Steel** and expect to over deliver on **Tier 3 Mains.** The main driver for this is the safety and reliability of the network. Undertaking work on these ageing assets keeps overall network risk at acceptable levels.

We expect to deliver broadly in line with the allowed **<2" Steel mains** commissioned workload over the price control, however, we will likely under deliver against the decommissioned targets. Volumes can vary as most of this mains type is replaced when we find it whilst replacing Tier 1 iron mains. The under delivery on decommissioned targets is due to a combination of the lay to abandon ratio used as part of RIIO-GD2 planning, and the volume of these mains found as part of Tier 1 replacement schemes.

4

Chapter 4

Innovation

we are the network

Chapter 4 - Innovation

4.1 Gas in Our Future Energy Systems

Network innovation projects are essential to provide critical evidence and understanding to support the energy systems transition and ensure that impact on customers in vulnerable situations is clearly understood. Such projects help to deliver increased efficiency and value for money, and develop the new technologies and approaches needed for decarbonisation. All of the UK's gas and electricity networks collaborate to share learnings, which ensures that projects are delivering against industry strategy and government energy and consumer policy.

For more information on energy based, please visit the **Smarter Networks Portal** **and** **FEN Innovation Portal**

You can also find out more information about individual projects involving NGN via our latest **Annual Innovation Summary** in NGNs **Document Library** – **The Future**.

NIA

Ofgem Network Innovation Allowance Ofgem Network Innovation Allowance (NIA)

NIA is a core driver of our innovation activity. This funding supports a broad range of projects selected and approved by NGN, all aimed at delivering tangible benefits, particularly for vulnerable customers and supporting the journey to net zero.

In this report, you'll find highlights of some of the inspiring projects we've delivered this year with NIA support.

Read more project details (ENA portal)

Read more project details (FEN portal)

Read NIA case studies

SIF

Ofgem Strategic Innovation Fund (SIF)

Managed by Ofgem via Innovate UK, the SIF provides up to £450 million in funding to electricity and gas networks from 2021 to 2026. Unlike NIA, SIF funding focuses specifically on projects with strong evidence that they can accelerate the transition to net zero and position the UK as a global leader in clean energy innovation.

The fund operates in three stages, from initial concept to full-scale delivery, with increased investment at each phase.

Strategic Innovation Fund

Additional sources for innovation include the Net Zero and Re-opener Development Fund Use it Or Lose it allowance (UIOLI), and additional funding sources, which are detailed below.

Use it or Lose it Fund

In its RIIO-2 Final Determination, Ofgem established a Net Zero and Re-opener Development Fund Use It or Lose It allowance (UIOLI). The purpose of the UIOLI is to enable network licensees to fund small net zero facilitation projects, and to allow for early development work on projects that network companies intend to bring forward at a later stage through other RIIO-2 net zero-related mechanisms. At RIIO-2 Final Determination, NGN were awarded £4.6m* (18/19 prices) under the UIOLI.

*17/18 price base.

Read more about our UIOLI fund

Additional funding sources

Beyond the funding streams referenced above, we also support innovation through alternative channels, including Total Expenditure (TOTEX), third-party partnerships, and other business investments. These sources help us drive operational efficiencies, refine high-readiness technologies, and embed improvements across NGN.

The following are some recent projects from NGN's RIIO-2 innovation portfolio:

Hydrogen Blending

Hydrogen blending is a critical enabler of the UK's hydrogen production ambitions, providing an offtake that supports producer investment, creates demand certainty, and accelerates the development of a hydrogen economy. The UK Government has confirmed it's strategic support for blending, publishing a strategic decision in 2023 to allow up to 20% blending in distribution networks. This was followed by an announcement in 2025 of its minded-to position to enable up to 2% blending in the GB gas transmission network.

Existing safety evidence has demonstrated that blending is deliverable for the UK's existing gas networks. The HyDeploy project has demonstrated that blends of up to 20% hydrogen can be introduced safely into existing distribution systems without requiring changes to domestic appliances. The Health and Safety Executive (HSE) is due to conduct a detailed review of the HyDeploy safety evidence, targeting completion in 2026, and the National Safety Evidence Review project has been established in order for the HyDeploy team to participate in the review process.

In anticipation of a positive formal policy decision that will trigger the necessary legislative and licence changes required to implement blending on the gas system, other NIA collaboration projects currently being undertaken include; the Hydrogen Blending Implementation Programme which will define the operational and market framework requirements for a blended network, and the Welding Residual Stress Measurement and Probabilistic Assessment of Hydrogen Pipeline Welds projects which will define optimal requirements in the repurposing of existing pipelines to convey hydrogen.

East Coast Hydrogen

East Coast Hydrogen is a collaborative project between Northern Gas Networks, Cadent and National Gas, which over the next 15 years, plans to utilise the existing gas distribution and transmission networks to connect planned hydrogen production and storage with industrial and large commercial gas users. This strategic move not only aims to secure jobs and investment in the region but also support industrial decarbonisation. The programme will leverage the natural assets of the North of England, including existing and potential hydrogen storage facilities, and build on the hydrogen production in two of the UK's largest industrial clusters in Teesside and the Humber. This will not only ensure significant private sector investment in the UK's industrial heartlands but also stimulate further investment.

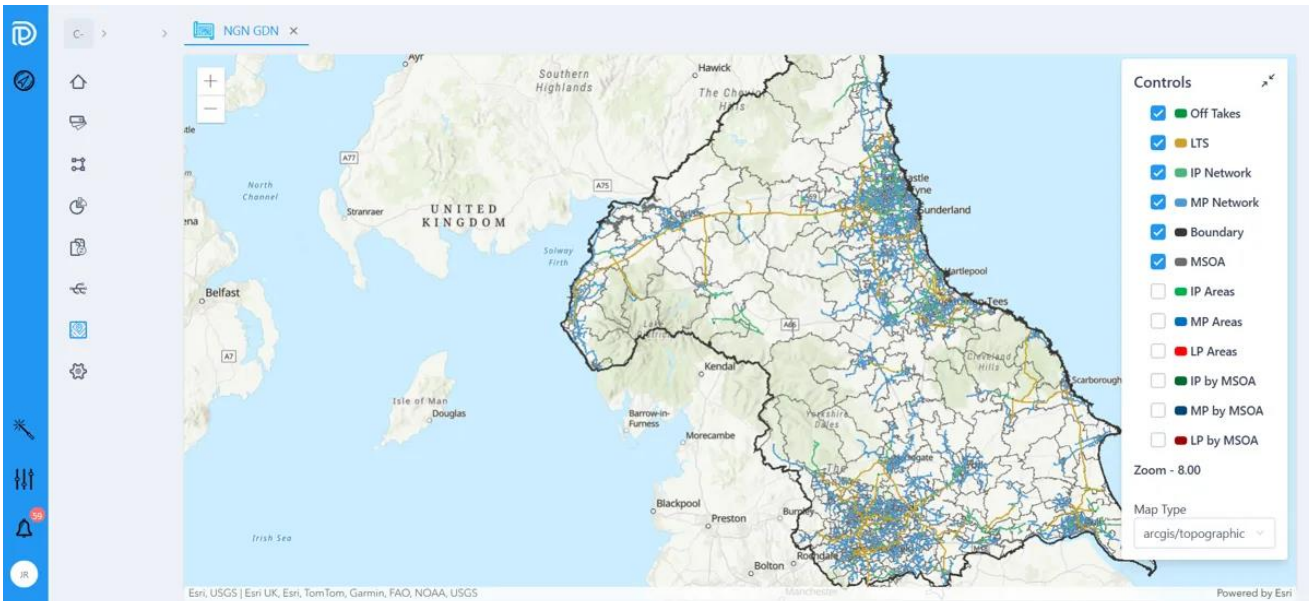
It will be the first major step in converting gas networks to hydrogen and will act as a blueprint for subsequent conversions across the UK. The project also demonstrates the innovation, engineering capabilities, and economic opportunity in the North and has the opportunity to create tens of thousands of highly skilled green jobs in the future hydrogen economy.

On 20th June, the UK energy regulator Ofgem confirmed £96 million funding for the next phase of the project, which over the next two years, will see all three networks deliver Front End Engineering Design (FEED) studies.

The FEED studies are the natural next step in enabling us to start repurposing and constructing our infrastructure, to understand how a hydrogen network can be operational in time to meet the UK government's net zero plans.

You can find more details of the project on https://www.eastcoasthydrogen.co.uk/

Navigator



This year, NGN embarked on an industry-leading innovation project to support strategic energy planning for a net zero future.

Recognising the need for a more comprehensive, data-driven approach, NGN has partnered with Scottish Gas Networks and industry specialists to develop Navigator. The sophisticated tool combines data from gas, electricity, heat and water sectors, along with crucial societal and regional insights, to model decarbonisation pathways in a dynamic, real-world way.

And unlike previous models, Navigator is a whole system energy tool and will take into account those all-important regional nuances, different public behaviours, and ever-changing policy changes for a smarter, more inclusive approach. It will ultimately help regional planners, energy strategists, policymakers, and local authorities make more informed decisions about when and where energy can be used best - ensuring no community is left behind on the path to net zero.

The first phase of the project started in February 2025, focused on the North East of England. Navigator is due to be rolled out in Spring 2026.

5.3 2 Network Innovation Allowance (NIA)

The following are recent projects from NGN's RIIO-2 NIA innovation portfolio:

Scaling Hydrogen with Nuclear Energy

This project documents a large body of evidence for Nuclear Enabled Hydrogen (NEH) production and how it can meet future hydrogen production demands. The overall conclusion is that credible solutions exist for advancing NEH projects, considering key factors such as policy, technology, operating models, regulation, financing, economics, siting, and public perception.

Furthermore, through analysis of credible sites for potential nuclear development and flexible operating models for NEH systems, it has been established that NEH could be produced to support between 10% and 108% of predicted 2050 demand in the NGN region, and between 19% and 189% in the WWU region considering low, medium and high ambition deployment scenarios. All scenarios would represent an increase in the available production compared current system energy modelling. When incorporated into energy transition planning, this could augment current predictions on hydrogen production. Predictable availability of NEH can reduce overall system costs by:

1. Minimising distribution and transition costs by generating hydrogen in strategic locations;

2. Underpinning low-carbon hydrogen supplies within NGN and WWU regions, providing local socio-economic benefits and a credible route to a gas network transition;

3. Optimising where and how much hydrogen storage would be required to meet fluctuating demands on a daily and annual basis.

NEH production could therefore complement predicted production capacity from other low-carbon solutions, offering more choice and flexibility to energy system planners and delivering greater consumer choice in the energy transition.

Reducing Gas Emissions During Pipeline Commissioning

Gas venting remains a necessary part of normal operations for maintenance or safety purposes. Previous research work undertaken by ROSEN and NGN with Wales and West Utilities as project partners, identified activities where venting of natural gas to atmosphere occurs (Gas Venting Research Project, NIA reference number NIA_NGN_282). This project identified pipeline commissioning as an activity that currently discharges significant volumes of natural gas to atmosphere.

NGN's mains laying procedures recommend commissioning of mains using the preferred method of direct purging (flowing natural gas through the main, above the minimum purge velocity, to replace air in the pipeline). Guidance requires the user to calculate the purge duration based upon tabulated purge velocity values. Each of the tabulated purge velocities currently covers a range of pipe diameters which results in the calculated purge duration being much longer than required for some pipe diameters which results in more gas being vented during commissioning than is required to remove all the air from the pipeline.

The project is currently going through the G23 process in which the newly calculated purge times are being calculated across 10 sites with various diameters and lengths. So far 2 sites have successfully completed trials with the results being positive in achieving the original aims of the project, with final results likely to be available by the end of 2025.

https://portal.futureenergynetworks.org.uk/content/projects/NIA_476#supplementary_data

IoT Pressure Sensor Pilot

Gas Distribution Networks are under increasing pressure to lay the foundations for the Energy Systems Transition to low/zero carbon, whilst maintaining customer services and to optimise efficiency. In support of this, NGN aimed to apply new digital technologies such as industrial Internet of Things (IoT) technology incorporating Machine Learning and AI systems that facilitate new insights into the overall management and decision-making processes, substantially reducing operational costs and continually improving performance of the network, for the shareholders and for the customer's ultimate benefit.

At present, NGN has real-time visibility of network performance via its primary SCADA system. The deployment of such technology remains mostly in the high-pressure systems to manage the intake of gas and management through the NGN networks through to the lower pressure tiers. In the lower pressure systems information from the network becomes less dense and moves from real time to near real time via traditional, data logger technology. This means, therefore, that detail surrounding the performance and behavioural characteristics of the high-pressure system is more acute than at below 7 bar, and more so as the pressures drop to 75mbar and below. This reduced level of information can mean a less effective and efficient response to prevailing conditions than would be desirable, with potential for increased costs, impact on customers and improvement opportunities missed.

The IoT Pressure Sensor Pilot focusses' on the application of low cost, simple pressure sensing technologies which promise to offer detailed views of system performance which will underpin the required operations to manage low carbon gas networks effectively, enabling improved situational awareness, and increasing opportunities to enable system flexibility, which will be particularly important for the Energy System Transition. The project has gone through various stages of enhancements to the sensor units after the field trials that were completed at NGNs Net Zero Research Village (NeRV) site in summer 2024. 4 new pressure sensors have been deployed at NeRV that will be collecting pressure data from the site. These units will be deployed to gather valuable data ad build confidence in the units to be deployed in NGNs live network.

Further updates on the IoT Pressure Sensor Pilot can be found at the following link: https://smarter.energynetworks.org/projects/nia_ngn_303/

5.4 3 Strategic Innovation Fund (SIF)

The following are recent projects from NGN's RIIO-2 SIF innovation portfolio:

Gas Network Evolution Simulator (Round 4 Discovery & Alpha)

GNES (Gas Network Evolution Simulator) uses Agent Based Modelling to simulate how people, policies, and infrastructure interact as the UK transitions away from natural gas. By reflecting real-world behaviours and decisions, it helps energy networks, policymakers, and communities explore fair, cost-effective pathways to decarbonisation. GNES reveals how transition choices impact different households and regions, ensuring no one is left behind. Developed by the Centre for Energy Equality with industry and public partners, GNES supports a whole-system approach to planning a just and resilient energy future that works for everyone, not just those able to move first. GNES involves collaboration across the sector, NGN leading the project with SGN, Cadent and NESO collaborating to deliver the Alpha phase which will be completed in April 2026.The project looks to answer Ofgem's challenge aim to 'develop critical evidence to support clarifying role of GB gas networks in net zero transition from a whole system perspective' and begin 'transition planning for an energy system with reducing natural gas demand'. During the Discovery phase of the project, we modelled the 7th Carbon Budget's recommendation of 50% of homes with heat pumps by 2040 within a diverse community that's representative of various building types and financial statuses. The model highlighted the stress on the headroom of various sub stations within the area and highlighted the resilience of the district governors to changes in demand. This will be further looked at in the Alpha and will help with communication with NESO and any strategic panning moving forward.

HyCoRe (Hydrogen Cost Reduction) (Round 2 Discovery & Alpha)

Renewable hydrogen and energy storage options are widely regarded as critical to achieving the UK's 2050 net-zero target. For project developers planning offshore-wind/hydrogen production facilities, an abundance of design choices and configurations exist, each of which has advantages and disadvantages, and questions remain about how to integrate electrolysers/energy storage devices into the existing energy systems.

These include:

1. Where best to locate these systems;
2. What enabling technologies are required to deploy them efficiently;
3. How to validate/demonstrate novel enabling technologies;
4. How to efficiently incorporate the resultant hydrogen into the existing gas network while minimising the costs of a secure, resilient, multi-vector energy system.

The Discovery Project Phase aimed to answer these questions through delivery of the following three primary work streams:

1. Defining the optimal methods of exporting energy from an offshore-wind farm in the context of value for money for customers
2. Defining the energy carrying characteristics of electricity vs hydrogen to establish the cost drivers and identify opportunities for cost reduction.
3. Understanding the impact on the gas/electricity networks of the imminent increase in renewable generation into the network and how strategic deployment of electrolysers, energy storage devices, and novel enabling technologies can reduce energy network investment requirements.

The Alpha Project Phase aimed to follow on from the Discovery phase further developing the project by focussing on the three key research areas below:

- National Modelling: identifying high-potential areas based on offshore/onshore constraints and opportunities.

- Modelling of a selected regional specific solution: understanding infrastructure solutions that will provide connectivity between offshore wind production areas and energy consumers/gas network.

- Technical challenge assessment: identifying technical challenges that may impede deployment and design/optimisation of test/validation solutions to de-risk technology pathways.

The Alpha phase identified UK regions with a strong potential for green hydrogen, produced from offshore-wind and injected into the onshore gas networks, to offer a more economic and deliverable solution than offshore wind farms producing electricity directly. Currently the project team are in discussions about a Beta phase submission.

Further information on the HyCoRe project can be found at the following link: https://smarter.energynetworks.org/projects/ref-10079341/

Appendix 1
Process methodology

A1

Appendix 1 - Process Methodology

A1.1.2 Daily Demand / Weather Modelling

Temperature explains most of the variation in daily LDZ demand, but a better fit can be obtained by including other variables. Within each model the Composite Weather Variable (CWV) which is the gas industry's data item that provides a measure of daily weather in each Local Distribution Zone (LDZ). It is calculated in UK Link using various data items, including weather variables such as temperature, wind speed and a set of parameters designed to provide a strong linear relationship to LDZ gas demand.

In order to compare gas demand between different years, we need to take out the variability of weather and see the underlying pattern. We do this by correcting records of actual weather to seasonal normal weather basis which is the same for all years. This allows comparison of demand under the same weather conditions to see underlying trends. The Seasonal Normal value of the Composite Weather Variable (SNCWV) is therefore a key parameter used in various calculations. CWV and SNCWV are key building blocks in the production of demand models, profiles, peak load factors and the Non-Daily Metered allocation formulae.

For stability across the many industry processes impacted, the Demand Estimation Sub Committee[6] (DESC) review the CWV and SNCWV, as a minimum, every 5 years. A new CWV and SNCWV figures came into effect on the 1st October 2025. Our forecast is based on this CWV. The new CWV incorporates more impacts of climate change than the previous version, but overall makes little change to our annual and peak demand forecast.

A1.1.3 Peak day Demand Modelling

Once the annual demand forecasts and daily demand/weather models have been developed, a simulation methodology is employed using historical weather data for each LDZ dating back to 1st October 1960. This determines the peak day and severe winter demand estimates. The model estimates what demand would be if historical weather from 1960 were to repeat today and generates a statistical distribution of the results which can be used to determine 1 in 20-year peak day demand. That is the level of demand you would statistically expect to occur once in every 20 years.

A1.1.4 High Pressure Tier Planning

Although the development of the GDN's Local Transmission System (LTS) is largely demand led, LTS capacity planning processes are not dissimilar to those utilised for the development of the National Transmission System (NTS). GDNs use forecast demand to model system flow patterns and produce capacity plans that take account of anticipated changes in system load and within-day demand profiles.

The options available to relieve LTS capacity constraints include:

- Uprating pipeline operating pressures
- Uprating offtakes from the NTS, regulators and control systems
- Constructing new pipelines or storage
- Constructing new supplies (offtakes from the NTS), regulators and control systems

[6] Demand Estimation Sub-Committee | Joint Office of Gas Transporters - Gas Governance

As well as planning to ensure that LTS pipelines are designed to the correct size to meet peak flows, there is a requirement to plan to meet the variation in demand over a 24-hour period. Diurnal storage is used to satisfy these variations and for NGN this is in the form of linepack.

A1.1.5 Below 7 barg planning

The lower pressure tier system (distribution system) is designed to meet expected gas flows in any peak six-minute period assuming reasonable diversity of demand. Lower tier reinforcement planning is based on LDZ peak demand forecasts adjusted to take account of the characteristics of specific networks.

Network analysis is carried out using a suite of planning tools with the results being validated against a comprehensive set of actual pressure recordings. The planned networks are then used to assess future system performance to predict reinforcement requirements and the effects of additional loads. Reinforcement options are then identified, costed and programmed for completion before the constraint causes difficulties within the network. Reinforcement is usually carried out by installing a new main or by taking a new offtake point from a higher-pressure tier. In general, the reinforcement project is of such a size that the work can be completed and operational before the following winter.

A1.1.6 Investment Procedures and Project Management

All investment projects must comply with The Investment Planning Policy, which set out the broad principles that should be followed when evaluating high value investment or divestment projects.

The Investment Planning Policy defines the methodology to be followed for undertaking individual investments in a consistent and easy to understand manner. This policy is used to ensure maximum value is obtained. For non-mandatory projects, the key investment focus in most cases is to undertake only those projects that carry an economic benefit.

For projects that are associated with Network Assets a key factor is the successful delivery of the Network Asset Risk Metric (NARM) risk reduction. This is a metric agreed with Ofgem at the beginning of the regulatory period and will help show that investment has delivered the required outputs.

For mandatory projects such as safety-related work, the focus is on minimising the net cost whilst not undermining the project objectives or the safety and reliability of the network. The successful management of major investment projects is central to our business objectives.

Our project management strategy involves:

- Allocating the appropriate project management expertise to manage the project
- Determining the level of financial commitment and appropriate method of funding for the project
- Monitoring and controlling the progress of the project to ensure that financial and technical performance targets are achieved post project and post investment review to ensure compliance and capture lessons learned

NGN have four frameworks in place to help deliver our Capital Investment Programme which were all competitively tendered through the OJEU process. These framework agreements ensure we build lasting relationships with our partners to deliver quality at the most efficient cost for our customers. Our new design framework was re-tendered this year and consists of five designers currently with a further three potentially being added subject to ongoing contract challenges mainly around liability. Our three delivery frameworks were re-tendered during 2021 and went live in May 2022, the Major Framework consists of six framework partners and work is awarded via mini competition, the two Minor Frameworks consist of four framework partners each, two assigned in the North and two in the South, and work is shared between them and prices negotiated. The frameworks have been designed to suit the work type, complexity, and volume to deliver the most economical value. All four frameworks are based on the NEC forms of contract which are renowned and approved worldwide as a project management contract, focussing particularly on cost and programme.

All projects are completed in line with the Capital Projects Integrated Management System (IMS) which covers the project lifecycle. The IMS is critical to ensuring NGN delivers projects consistently and in line with all relevant legislative requirements fulfilling NGN's obligations as the employer.

Our project management of capital investment projects is designed to ensure that they are delivered on time, to the appropriate quality standards at minimum cost. The project management process makes use of professional consultants and specialist contractors, all of whom are appointed subject to competitive tender.

Performance of the Contractors is monitored using Key Performance Indicators (KPI's) to ensure that the standards of Health & Safety, Environmental Performance, Quality, Commercial Performance and Programme management are all of the required level. Within the new framework, these figures will be used to incentivise high levels of performance, whilst still providing a tool to ensure consistent levels of performance.

Where Third Party funded schemes are raised, these are sanctioned, awarded, and managed in exactly the same way with a focus on value, programme and quality, however the Project Manager role may be sourced from the Professional Services Framework (as opposed to an NGN employee) on an ad-hoc basis to ensure that the Capex workload is delivered without compromise.

Appendix 2
Gas Demand Forecasts

A2

Appendix 2 - Gas Demand Forecasts

A2.1 Annual Demand

Annual demand forecasts are developed without knowledge of future weather conditions. Consequently, we calculate a Seasonal Normal Temperature (SNT) based on past averages. To compare throughput between years, actual demand data is adjusted to account for the variance of actual weather and SNT. This is known as weather corrected demand.

The network code states that the calculated methodology used to derive seasonal normal values must be reviewed periodically. The 'seasonal normal composite weather variables' (SNCWV) have been reviewed and the new figures went live on the 1st October 2025. Seasonal normal values reflect the general upturn, in warm weather, that has been experienced over the past decade.

Derivation of the seasonal normal values is designed to reflect the most accurate statistical relationship between demand and weather. Unlike previous versions of CWV and SNCWV this version attempts to estimate the impact of global warming and as such the peak 1 in 20 weather assumptions have altered to reflect the greater variation in extreme temperatures. This results in a slightly colder 1 in 20 peak weather condition for our networks. Our internal processes previously had an adjustment to recognise this, which is now no longer required, and the resulting change to our 1 in 20 peak demand is limited because of the move to the new CWV and SNCWV basis.

Over the next ten years annual gas demand is forecast to increase by 8.96% in the Northern LDZ and an increase of 7.90% in the North East LDZ, and 8.40% overall for NGN. As discussed in section 1.2, most of this is due to recovery of gas demand to levels seen in 2021 prior to the cost of living crisis. Some of this recovery has already been seen in 2024, which increased 6.2% in 2024 compared to 2023. Most of this recovery was in the domestic sector, which has been most affected by the cost of living crisis. When compared to 2021 gas demand levels the gas demand at the end of the forecast period is 3.00% lower than 2021 in the Northern LDZ and an 0.11% lower in the North East LDZ.

This is a little lower than last year's forecast and due to slightly more pessimistic views of the economy and slightly higher gas prices forecast than in our previous year's gas demand forecast. There is always an uncertainty over the economic outlook and UK gas prices; amongst other factors which are outlined in section A2.2.

The following tables show the LDZ specific forecasts:

Northern LDZ

Load Band	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
0-73 MWh	16.5	16.9	17.3	18.0	18.0	17.9	17.9	17.9	18.0	18.0
73-732 MWh	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4
732-5860 MWh	3.8	3.8	3.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9
> 5860 MWh	6.7	6.7	6.7	6.8	6.8	6.8	6.8	6.8	6.8	6.8
LDZ Shrinkage	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
LDZ Demand	29.3	29.8	30.2	31.1	31.2	31.1	31.1	31.1	31.1	31.2

Table A2.1A Forecast Annual Demand by Load Category & Calendar Year for North LDZ from 2025 Demand Statements

Note: Figures may not sum exactly due to rounding.

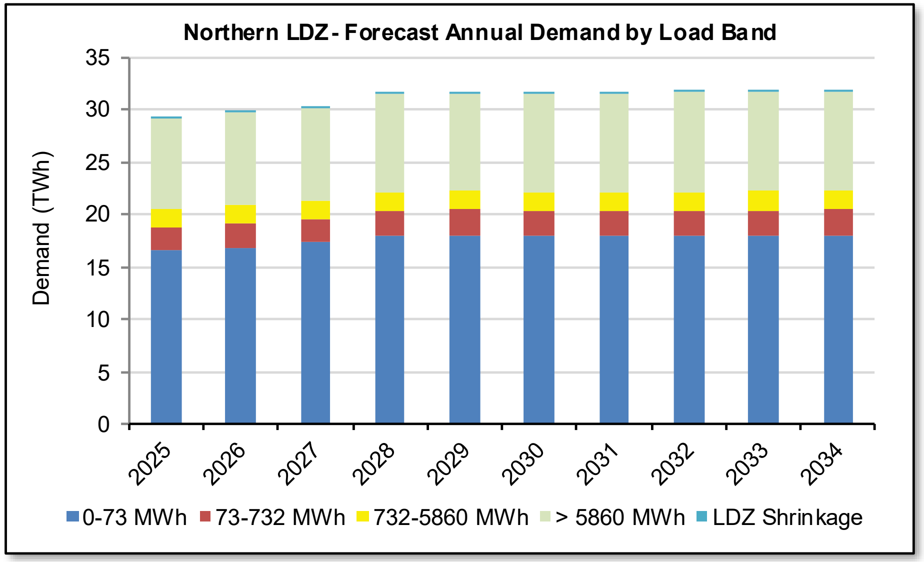


Figure A2.1A Northern LDZ - Forecast Annual Demand by Load Band

North East LDZ

Load Band	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
0-73 MWh	19.3	19.7	20.3	21.2	21.3	21.2	21.3	21.3	21.4	21.4
73-732 MWh	2.7	2.7	2.8	2.9	2.9	2.9	2.9	3.0	3.0	3.0
732-5860 MWh	4.3	4.4	4.4	4.4	4.5	4.5	4.6	4.7	4.7	4.8
> 5860 MWh	7.5	7.4	7.4	7.4	7.3	7.3	7.3	7.3	7.2	7.2
LDZ Shrinkage	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
LDZ Demand	33.9	34.3	35.0	36.0	36.2	36.1	36.2	36.3	36.4	36.5

Table A2.1B Forecast Annual Demand by Load Category & Calendar Year for North East LDZ from 2025 Demand Statements (TWh)

Note: Figures may not sum exactly due to rounding.

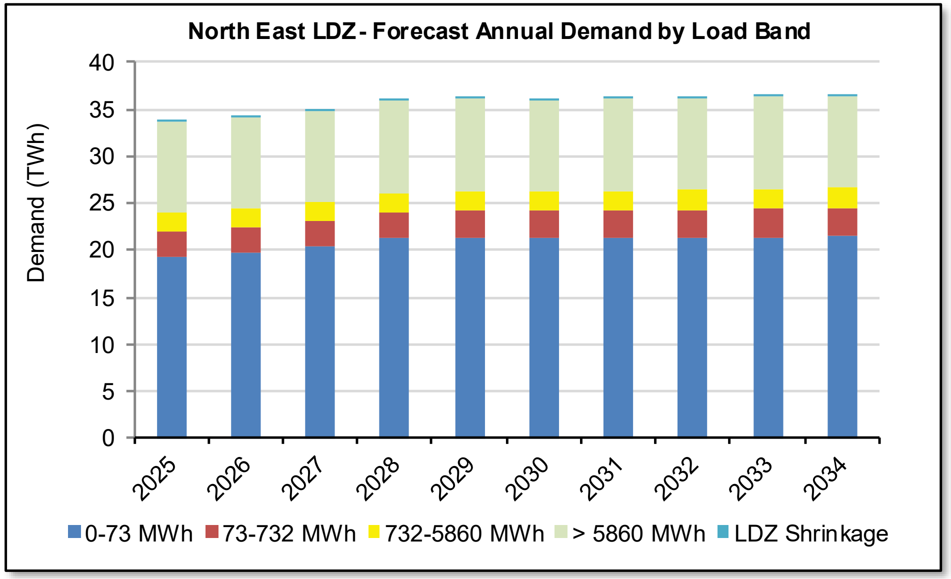


Figure A2.1B North East LDZ - Forecast Annual Demand by Load Band

A2.2 Forecasting approach and Key Assumptions in developing the 2025 NGN Demand Forecasts

Our annual forecast is based on bottom up granular forecasting where possible. Where this is not possible, econometric analysis is used. Annual demand is forecast first, then relationships between annual and peaks demands are established and used to derive peak. This is done per demand load band. The method for our annual forecast is:

- For our domestic customers all elements except one are forecast on a bottom-up basis. Modern houses and older houses are forecast separately, as they have different thermal efficiencies. The bottom-up elements forecast separately include:
  - numbers of customers connected to our networks
  - impacts of energy efficiency, both thermal and heating from boilers and heating controls.
  - The numbers of houses switching to renewable heating, via heat pumps
  - Comfort levels – the degree to which people heat their homes - is then forecast via econometric forecasting, and applied to all houses.
- Our largest customers are forecast individually.
- Econometric forecasting is used to forecast demand for the rest of our customers. This is done by LDZ and by loadband.

Our peaks forecast are derived from annual demands per loadband. This uses the analysis of historical demand and the composite weather variables per LDZ derived by Xoserve. Whilst the annual demand forecast is a bottom up process where possible, the derivation of peak demands is a top down approach, per load band. This section provides an overview of the key assumptions used to inform our 2025 demand forecasts – both economic and non economic assumptions. The commentary underpins the forecasts made back in the first quarter of this year, in which the continued impact of the cost of living crisis and high energy prices on the economy are still being felt. The base date for our 2025 forecast model captures the currently high levels in gas prices, but also recognises they have started to reduced from their highest points. Our modelling has assessed the impacts these have had on different sectors of demand. We forecast prices will generally continue to reduce although there remains uncertainty how the market and prices over the coming years.

Our analysis of how demand in different load bands are affected by economic factors concludes that domestic prices have been greatly affected by high prices and the current economic situation, whereas non domestic sectors have been considerably less affected by these factors, especially price.

For the domestic sector we have managed to assess how comfort levels (the temperature to which people heat their homes) have been impacted by prices and other factors. This forms the largest element of gas demand changes in our forecast. As previously described, most of the forecast variation is recovery towards 2021 demand levels, as economic burdens ease.

This section provides an overview of the key assumptions that have most impact on our 2025 demand forecasts – both economic and non economic assumptions

Gross Domestic Product (GDP) and Gross Value Added (GVA)

GVA measures the contribution to the economy of each individual producer, industry or sector in the United Kingdom. GVA is used in the estimation of GDP, which is a key indicator of the state of the whole economy. Therefore, it is an important driver for gas demand. A significant decline in GDP occurred during 2008/9 set against a long period of growth from 1992, and a more recent decline occurred as a result of the covid pandemic in 2020. Other than these periods, there has generally been steady and sustained growth in GDP. The economic figures produced by the Office of National Statistics (ONS) show the impact to the economy during 2024 (see graph below).

The preliminary figures from the ONS show that annual GDP growth for 2024 is around 1.1%. This is an increase from the outturn figure for 2023 of 0.1%. The level of growth is expected to increase to 2.0% in 2025, before reducing to 1.8% in 2026, 1.5% in 2027 and 2028 to increase slightly to 1.6% in 2029. The Office for Budget Responsibility (OBR) published their forecasts GDP in October 2024 which is shown in figure A2.2.1A.

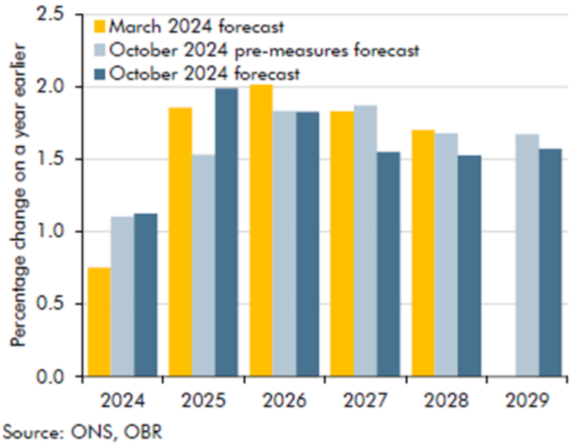


Figure A2.2.1A – UK Real GDP Growth Chart

Gas & Energy Prices

We have witnessed a delinkage between gas markets and energy markets in recent years, most notably a delinkage between oil and gas. This has been particularly noticeable since the Ukraine conflict. As a result we forecast gas markets separately, and do not focus on other energy markets to inform the gas price forecast we use.

Analysis shows that gas prices and demand are inversely related; an increase in price leads to a demand reduction. This section focusses on changes in wholesale gas price. There is a delay before this feeds into other retail markets, for domestic commercial and industrial gas prices. These vary between markets, and each year we assess the linkage and incorporate this into the forecasts we have for wholesale gas prices. The retail gas prices we use for gas demand forecast are ultimately derived from the wholesale forecast that we have.

Figure A2. 2.1B– Wholesale gas price in 2024 prices (p/therm)

Wholesale Price

The wholesale price has changed considerably in the last few years. Since a substantial increases in 2021 and 2022 mainly due to the war in Ukraine, it reduced significantly in 2023 and furthermore in 2024, due to gas supplies stabilising to Europe. It started increasing to some extent towards the end of 2024 and early 2025.

The forecast provided is the price forecast provided by our forecast provider. It is based on an assessment of market fundamentals, and sentiment, and is informed by and benchmarked with available gas price forecasts at the time of its creation. These include forecasts of wholesale price used by NESO and DESNZ for their energy demand forecasts, but adjusted to account for the current levels. From the next 2 years prices are a little higher than in the forecast last year to reflect the current market price, but remain unchanged from last year's forecast as the market and supply fundamental have changed little in the last 12 months. It results in an enduring forecast that remains relatively stable on an annual basis at levels that are significantly lower than 2021 and 2022, but is also higher than the average price experienced in 5 year period from 2016 to 2020.

Efficiency

Thermal efficiency of properties improved greatly between 2008 and 2012, due the Carbon Emissions Reduction Target (CERT). This was a government policy that ran between 2008 and 2012, which required larger gas and electricity suppliers to achieve targets for reducing carbon emissions from domestic premises in Great Britain. At its peak, it was installing over 1 million measures of retrofit thermal insulation into properties per year. These were mainly cavity wall, loft and solid wall insulation measures.

Since 2012 the main government policy to incentivise thermal efficiency improvements in properties has been the Energy Companies Obligation (ECO), which is now on its 4th iteration – ECO4. ECO has resulted in lower levels of retrofit insulation, and each iteration of ECO has delivered less the previous. This is largely due to having a smaller target market, with only householders in receipt of benefits being eligible.

In the last 2 years new policies have been launched to aid retrofit insulation measures in gas fired houses. These are the Great British Insulation Scheme (GBIS), WH:SHF (Warm Homes: Social Housing Fund (previously SHDF)) and WH:LG (Warm Homes: Local Grant). The WH:LG includes on gas grid homes for the first time this year. WH:SHF has very little impact on our forecasts, as its focus is more on whole house retrofit for social housing, and its budget does not cover many houses. The WH:LG is also a smaller scheme with little impact, however the GBIS is designed for wider rollout of insulation measures, and as a result has a larger impact on the gas demand forecast, and its performance has improved recently. We have included forecasts of all of these schemes in our demand forecast, based on current performance levels. Whilst they have some impact on overall efficiency improvements, there is only a limited reduction in gas demand over the forecast period. Overall, they result in a reduction of 3.4% of domestic gas demand over the 10-year period.

Another efficiency element that we forecast for domestic demand is the increasing efficiencies of boilers. Since 2005 the government requirement for all boilers to be high efficiency condensing boilers has had a significant impact in reducing domestic gas demand. However as boilers have become more efficient, the future improvement potential has lessened. Our forecast for improving boiler efficiency results in a 2.3% reduction in gas demand over the ten year period.

Domestic Behaviour changes

Comfort levels – the degree to which people heat their homes, has had the greatest single impact on gas demand in our LDZs in the last couple of years. Between 2021 and 2023 domestic demand in our networks reduced by 15%. This was almost all due to comfort levels lowering, as people have reduced their heating temperatures, and periods of heating to save as much money as possible, as a result of the cost of living crisis. Our forecast for how this is to change is the result of our economic analysis, and its impact is significant. It accurately forecast the 6% increase in this element in 2024, as cost of living pressures started to ease.

Our forecast of fuel prices, household disposable income and wider impacts are used to establish the behaviour change in our forecast. Overall reducing gas prices and a slowly improving economy and household disposable income, result in increases in our forecast over the next few years. Our forecast for this results in comfort levels returning to pre cost of living crisis levels in our LDZs around 2028, and are the main reason for increases in our gas demand forecast over the next 10 years. Although it should be noted the forecast increases are not really underlying increases, but recovery to demand levels seen in 2021.

New houses

For gas demand from new houses we forecast the number of new houses and also the gas demand per new house. The numbers of new houses are forecast at growth rates linked to GDP using the historical relationship of new houses to GDP; and applied to our GDP forecast. New houses have a much lower gas demand than an average house due to higher energy efficiency of new houses. Gas demand per new house is assessed separately using EPC values for new and existing houses as a basis for this analysis. We have not included the potential impact of Future Homes Standard in the forecast, because at the time of the forecast and writing, this is yet to be legislated and there remain uncertainties as to what any final legislation, may be. The forecast remains based only on legislation that is in place, and does not speculate on that which may occur. Any impact of this policy should it come into place would be relatively low, around 1-2% in total at the end of the forecast period, due to the relatively low numbers of houses built in this period, and their low gas demand.

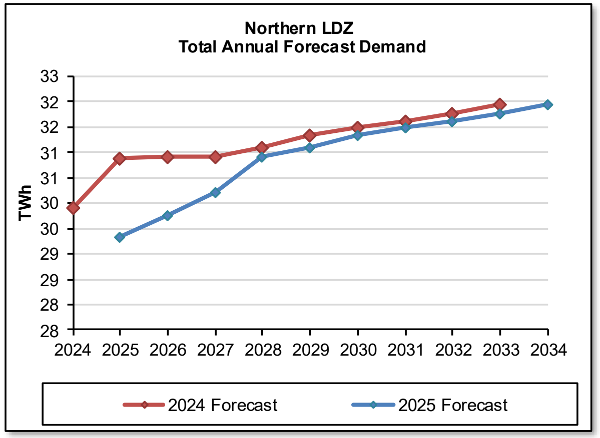
Renewable Heating

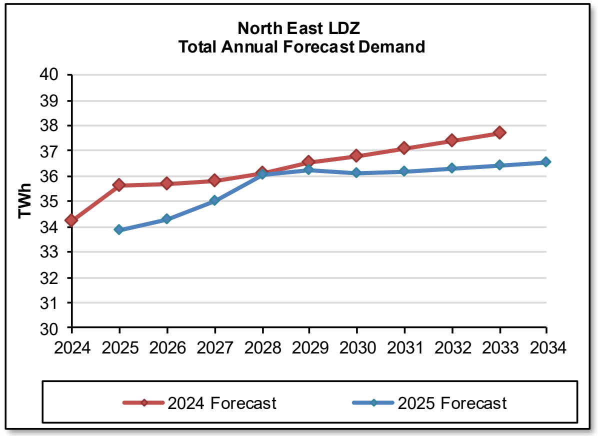
To aid the move to renewable heating, the Boiler Upgrade Scheme (BUS) began in April 2022. The scheme provides grants to encourage property owners to replace existing fossil fuel heating with, low carbon heating systems. Our forecast for BUS reflects the performance since the September 2023 incentive and budget were increased. This performance continues until 2028, the end of the new budgeted period. It then continues for the rest of the forecast period at this rate. Whilst the performance of this scheme has increased notably in 2024, its impact remains low as the numbers of boiler replacements for low carbon heating numbers remain relatively low.

The impact of boilers being replaced by heat pumps averages 1.4% reduction in total domestic demand in 2034.

A2.3 Forecast Comparisons

The following charts provide a comparison of the current forecasts with those published in the 2024 Demand Statements (DS).





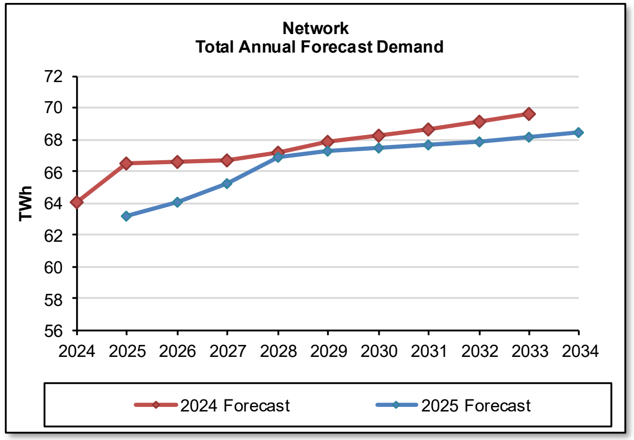


Figure 2.3A – Northern LDZ Total Annual Forecast Demand

Figure 2.3B – North East LDZ Total Annual Forecast Demand

Figure 2.3C – NGN Total Annual Forecast Demand

Northern Forecast (TWh)			
Year	**2024 DS**	**2025 DS**	**% Difference**
2025	30.89	29.33	-5.07
2026	30.92	29.76	-3.77
2027	30.92	30.22	-2.24
2028	31.11	30.92	-0.63
2029	31.36	31.11	-0.78
2030	31.49	31.36	-0.42
2031	31.62	31.49	-0.44
2032	31.78	31.62	-0.49
2033	31.95	31.78	-0.54
2034		31.95	

North East Forecast (TWh)			
Year	**2024 DS**	**2025 DS**	**% Difference**
2025	35.62	33.86	-4.93
2026	35.71	34.30	-3.94
2027	35.78	35.00	-2.20
2028	36.13	36.03	-0.30
2029	36.55	36.22	-0.89
2030	36.81	36.10	-1.93
2031	37.08	36.19	-2.40
2032	37.38	36.29	-2.93
2033	37.70	36.42	-3.41
2034		36.54	

NGN Forecast (TWh)			
Year	**2024 DS**	**2025 DS**	**% Difference**
2025	66.51	63.19	-5.00
2026	66.63	64.06	-3.86
2027	66.70	65.22	-2.22
2028	67.24	66.94	-0.45
2029	67.90	67.34	-0.84
2030	68.29	67.45	-1.23
2031	68.70	67.68	-1.50
2032	69.16	67.91	-1.81
2033	69.66	68.20	-2.09
2034		68.49	

Appendix 3

Actual Flows 2024

A3

Appendix 3 – Actual Flows 2024

A3.1 Annual Flows

Annual forecasts are based on average weather conditions. Therefore, when comparing actual throughput with forecasts, throughput has been adjusted to take account of the difference between the actual weather and the seasonal normal weather. The result of this calculation is the weather corrected throughput.

The basis for any calculation of forecast demand is the accuracy of the previous forecast.

Table A3.1.A and chart A3.1.B provide a comparison of actual and weather corrected throughputs during the 2024 calendar year, with the forecast demands presented in the 2024 Demand Statements. Annual demands are presented in the format of LDZ and NTS load bands/categories, consistent with the basis of system design and operation.

The 2024/25 winter severity, compares the latest winter against the previous 65 winters starting from October 1960, and it was deemed to be a warmer than average winter. The 6 month period from October 2024 to March 2025, was the 12th warmest winter in the last 65 years.

Northern LDZ 2024	Actual Demand	Weather Corrected Demand	Forecast Demand	Corrected v Forecast (%)
0 to 73.2 MWh	13.99	15.43	17.77	-13.2
73.2 to 732 MWh	2.03	2.18	2.35	-7.5
>732 MWh	9.47	9.69	11.45	-15.4
Shrinkage	0.12	0.12	0.13	-5.1
Total LDZ	26.77	28.57	31.71	-9.9

Table A3.1A Northern LDZ Throughput 2024 **Note:** Figures may not sum exactly due to rounding.

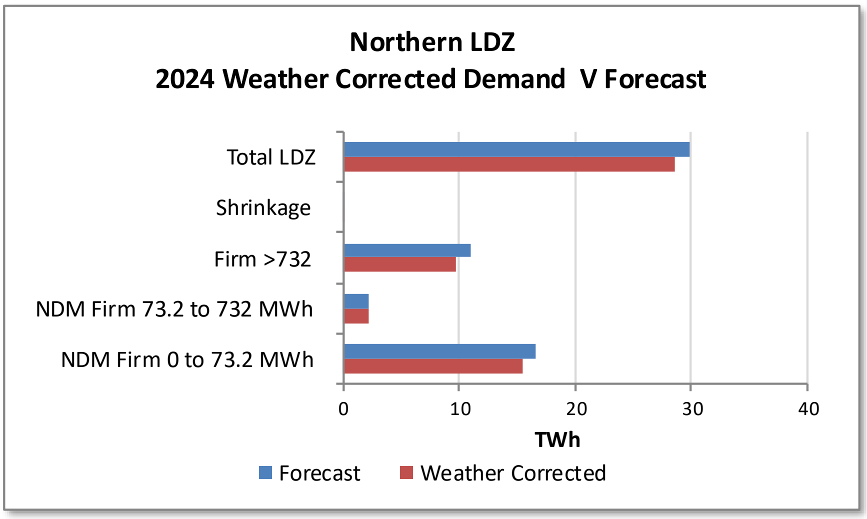


Chart A3.1B 2024 Northern LDZ Weather Corrected Demand V Forecast

In the Northern LDZ, the forecasts for each of the loadbands, were higher than the actual throughput. Overall the total LDZ weather corrected throughput was 9.9% lower than forecast.

North East LDZ 2024	Actual Demand	Weather Corrected Demand	Forecast Demand	Corrected v Forecast (%)
0 to 73.2 MWh	16.74	17.82	20.76	-14.1
73.2 to 732 MWh	2.45	2.57	2.85	-9.9
>732 MWh	11.38	11.52	12.89	-10.6
Shrinkage	0.14	0.14	0.15	-3.8
Total LDZ	30.72	33.51	36.65	-8.6

Table A3.1C North East LDZ Throughput 2024 **Note:** Figures may not sum exactly due to rounding.

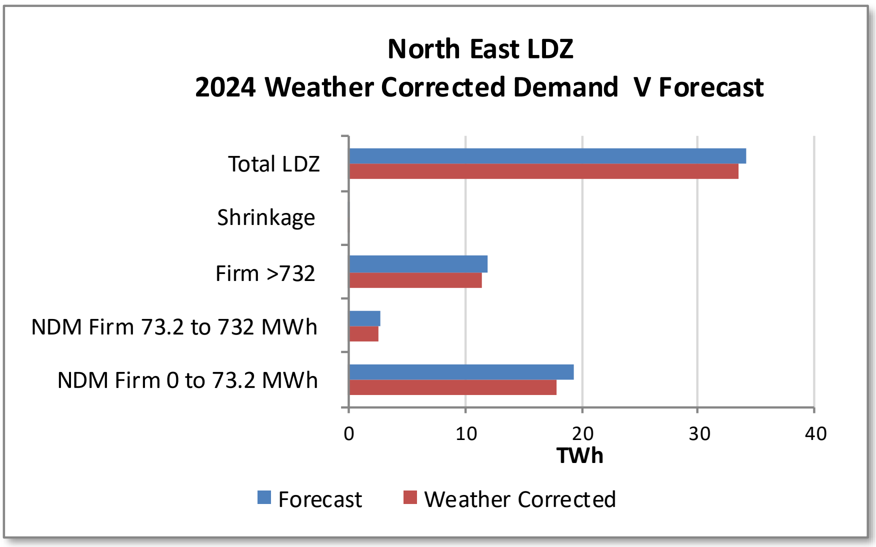


Chart A3.1D 2024 North East LDZ Weather Corrected Demand V Forecast

Similarly, the North East LDZ forecasts were overstated for all load bands. At LDZ level, the weather corrected throughput was 8.6% lower than forecast.

A3.2 Peak Flows

Our 2025 forecasts suggest that over the next ten years, the 1 in 20 Peak day forecast demand will decrease by 0.8% in the Northern LDZ and decrease by 0.01% in the North East LDZ in line with annual forecasts, as shown by the charts below.

The maximum demand day for Northern LDZ during winter 2024/25 was 9th January 2025, when the network demand was 14. 66 mcm, equating to **74.2%** of the expected 1 in 20 peak day for winter 2024/25. This was 3.7% higher than the highest demand day in 2023/24 of 14.41 mcm.

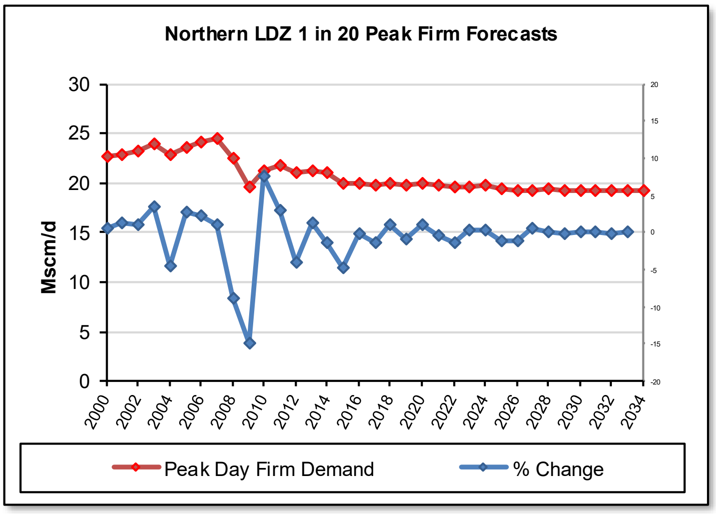


Figure 3.2a Historical Throughput & Forecast Peak day Firm Demand for Northern LDZ

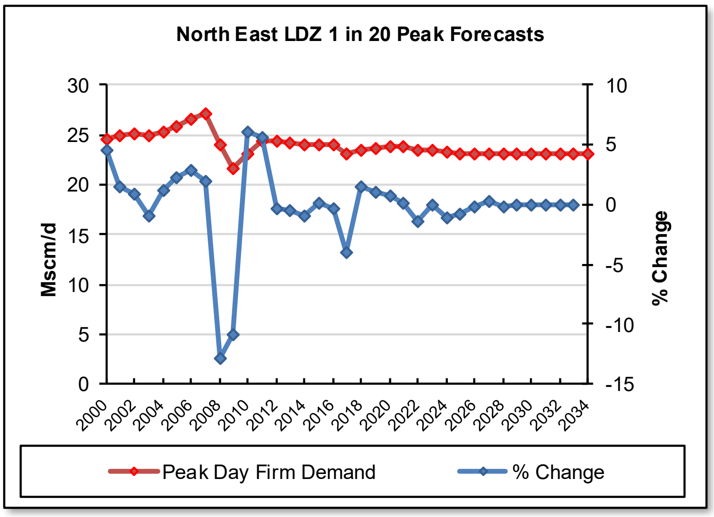


Figure 3.2b Historical Throughput & Forecast Peak day firm Demand for North East LDZ

The maximum demand day for North East LDZ during winter 2024/25 was 9th January 2025, when the network demand was 17.09 mcm, equating to **73.2%** of the expected 1 in 20 peak day for winter 2024/25. This was 1.5% higher than the highest demand day in 2023/24 of 16.83 mcm.

Appendix 4

Connections to our system

A4

Appendix 4 – Connections to our System

A4.1 Connection Services

Within the space of a few years, the gas industry in the UK has evolved from a situation where one company provided all new connections, to one where many alternative connection services are now available on a competitive basis.

Indeed, whilst Northern Gas Networks continues to offer connection services in line with our Gas Act obligations, customers and developers have the option to choose other parties to build their facilities, have the connection vested in or adopted by the host gas transporter (depending upon circumstances), pass assets to a chosen system operator, transporter, or retain ownership of them.

The following are the generic classes of connection;

Entry Connections: connections to delivery facilities processing gas from gas producing fields or, potentially in the future, LNG vaporisation (i.e. importation) facilities, for the purpose of delivering gas into the NGN system. Biomethane is a fully renewable source of energy and NGN is fully committed to maximising the entry of biomethane into our gas network.

Exit Connections: connections that allow gas to be off taken from our system to premises (a 'Supply Point') or to Connected System Exit Points (CSEPs). There are several types of connected system including:

- A pipeline system operated by another gas transporter
- Any other non-NGN pipeline transporting gas to premises consuming more than 2,196MWh per annum
- Storage Connections: connections to storage facilities for the purpose of temporarily off taking gas from our system and delivering it back at a later date

Please note that storage may both deliver gas to the system and offtake gas from the system, therefore specific arrangements pertaining to both Entry and Exit Connections will apply. In addition to new pipes being termed connections, any requirement to increase the quantity of gas delivered or off taken is also treated as a new connection.

A4.2 Connections to the Local Transmission System

There have been 10 HP Connection enquiries and 0 HP connections for the gas year Oct 24 – Sep 25. There have been no new physical HP connections.

A4.3 Non-Standard Connections

NGN have seen a continued reduction in the number of quotation enquiries for large load flexible generation connections - 1 year to date (Oct 24 – Sept 25). We expect that flexible generation enquiries will continue to reduce in numbers throughout the remainder of GD2 and into GD3 due to the areas of the UK that require flexible generation already being covered and the increasing focus on decarbonisation. We currently have 12 live issued quotes with customers and expect a number of these to be accepted and progress to a connection.

There are 17 flexible power generation sites currently connected to NGN's system, with another 5 accepted sites anticipated to progress across RIIO-GD2 and into GD3. There are also 2 compressed natural gas (CNG) sites connected to the network.

Over the past year, NGN has experienced a rise in data centre connections enquiries. Many of these requests have been substantial in scale and will have a notable impact on the network. We anticipate continued and growing interest in data centre connectivity in the future.

NGN have numerous ongoing innovative hydrogen projects and are continuously working with producers and the wider industry to facilitate a mixture of both blending and 100% hydrogen injection enquires.

A4.4 Additional Information Specific to System Entry and Storage Connections

We require a Network Entry Agreement or Storage Connection Agreement as appropriate, with the respective operator of all delivery and storage facilities to establish, among other things, the gas quality specification, the physical location of the delivery point and the standards to be used for both gas quality and the measurement of flow.

A4.4.1 Network Entry Quality Specification

For any new entry connection to our system, the connecting party should notify us as soon as possible as to their likely gas composition. We will then determine whether the gas can be accepted, taking into account our existing statutory and contractual obligations.

The ability of NGN to accept gas supplies into the system is affected by, among other things, the composition of the new gas, the location of the system entry point, volumes entered, pressure ranges and the quality and volumes of gas already being transported within the system.

In assessing the acceptability of any proposed new gas supply, we will take account of the following.

a) Our ability to continue to meet statutory obligations (including, but not limited to, the Gas Safety Management Regulations 1996 (GS(M)R)).
b) The implications of the proposed gas composition on system running costs.
c) Our ability to continue to meet our contractual obligations.

For indicative purposes, the schedule set out below is usually acceptable for most locations and encompasses, but is not limited to, the statutory requirements set out in the GS(M)R. https://www.legislation.gov.uk/uksi/1996/551/schedule/3/made

A4.5 Additional Information Specific to System Exit Connections

Any person can contact NGN to request a connection, whether a shipper, operator, developer or consumer. However, gas can only be taken off the system where the Supply Point created has been confirmed by a shipper, in accordance with the Uniform Network Code.

More information regarding NGN connections can be found here https://www.northerngasnetworks.co.uk/gas-connections/

A4.6 National Transmission System (NTS) Connections

For information regarding NTS Connections visit https://www.nationalgas.com/our-businesses/connections

A4.7 Distribution Network Connections

Gas will normally be made available for offtake to consumers at a pressure that is compatible with a regulated metering pressure of 21mbarg.

A4.8 Self Lay Pipes or Systems

In accordance with Section 10(6) of the Gas Act, and subject to the principles set out in the published Licence Condition 4B Statement and the terms and conditions of the contract between us and the customer in respect of the proposed connection, where a party wishes to lay their own service pipe to premises expected to consume 2,196MWh per annum or less, ownership of the pipe will vest in us once the connection to our system has been made.

Where the connection is for a pipe laid to premises expected to consume more than 2,196MWh per annum or the connection is to a pipe in our system which is not a relevant main, self-laid pipe do not automatically vest in us. However, subject to the principles set out in the published Licence Condition 4B Statement and the relevant contractual terms and conditions, we may take ownership of pipes to such premises.

Parties considering laying a pipe that will either vest in us or is intended to come into our ownership should refer to our Connections Methodology Statement and contact our connections team on 0800 040 7766 and (option 2) or email gasconnections@northerngas.co.uk

A4.9 Reasonable Demands for Capacity

Operating under the Gas Act 1986 (as amended 1995), we have an obligation to develop and maintain an efficient and economical pipeline system and, subject to that, to comply with any reasonable request to connect premises, provided that it is economic to do so.

In many instances, specific system reinforcement may be required to maintain system pressures for the winter period after connecting a new supply or demand. Details of how we charge for reinforcement and the basis on which contributions may be required can be found in the published Licence Condition 4B Statement. Please note that dependent on scale, reinforcement projects may have significant planning, resource and construction lead-times and that as much notice as possible should be given. We will typically require three to four years' notice of any project requiring the construction of high-pressure pipelines or plant, although in certain circumstances, project lead-times may exceed this period.

Glossary

Of terms

Glossary of Terms

Calorific Value (CV)
The ratio of energy to volume measured in mega Joules per cubic meter (MJ/m3), which for a gas is measured and expressed under standard conditions of temperature and pressure.

Composite Weather Variable (CWV)
A single measure of weather for each LDZ, incorporating the effects of both temperature and wind speed. A separate composite weather variable is defined for each LDZ.

Distribution Network (DN)
An administrative unit responsible for the operation and maintenance of the local transmission system (LTS) and <7barg distribution networks within a defined geographical boundary.

Diurnal Storage
Gas stored for the purpose of meeting, among other things, within day variations in demand. Gas can be stored in special installations, such as gasholders, or in the form of linepack within transmission, i.e. >7barg, pipeline systems.

Formula Year
A twelve-month period commencing 1st April, predominantly used for regulatory and financial purposes.

Gas Supply Year
A twelve-month period commencing 1st October, also referred to as a Gas Year.

Gas Transporter (GT)
Formerly Public Gas Transporter (PGT), GTs, such as Northern Gas Networks, are licensed by the Gas and Electricity Markets Authority to transport gas to consumers.

Kilowatt hour (kWh)
A unit of energy used by the gas industry. Approximately equal to 0.0341 therms. One megawatt hour (mWh) equals 103 kWh, one gigawatt hour (GWh) equals 106 kWh, and one terawatt hour (TWh) equals 109 kWh.

Linepack
The volume of compressed gas within the National or Local Transmission System at any time.

Load Duration Curve (1 in 50 Severe)
The 1 in 50, or severe, load duration curve is that curve which, in a long series of years, with connected load held at the levels appropriate to the year in question, would be such that the volume of demand above any given demand threshold (represented by the area under the curve and above the threshold) would be exceeded in one out of fifty years.

Load Duration Curve (Average)
The average load duration curve is that curve which, in a long series of winters, with connected load held at the levels appropriate to the year in question, the average volume of demand above any given threshold, is represented by the area under the curve and above the threshold.

Local Distribution Zone (LDZ)
A geographic area supplied by one or more offtakes. Consists of LTS and distribution system pipelines.

Local Transmission System (LTS)
A pipeline system operating at >7barg that transports gas from one or more offtakes to distribution systems. Some large users may take their gas direct from the LTS.

National Transmission System (NTS)

A high-pressure system consisting of terminals, compressor stations and pipeline systems. Designed to operate at pressures up to 85 bar. NTS pipelines transport gas from terminals to LTS offtakes.

Non-Daily Metered (NDM)

Gas distribution networks review their total consumption in an LDZ vs the total consumption of the daily metered (DM) sites within a particular LDZ. The remaining consumption is then allocated as non-daily metered (NDM) consumption, which is then divided between the shippers, who supply gas to that LDZ, by applying an agreed formula.

It should also be noted, that following the implementation of project nexus in 2017, all meter points regardless of the supply class or registered demand volumes are reconciled when a valid meter read is submitted by the consumer.

Odorisation

The process by which the distinctive odour is added to gas supplies to make it easier to detect leaks. We provide odorisation at our offtakes.

Offtake Capacity Statement (OCS)

The Offtake Capacity Statements are received by NGN in September of each year from National Grid specifying assured pressures and the amount of capacity available at each offtake.

Own Use Gas (OUG)

Gas used by us to operate the transportation system. Includes gas used for compressor fuel, heating and venting.

Peak day Demand (1 in 20 Peak Demand)

The 1 in 20 peak day demand is the level of 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.

Seasonal Normal Composite Weather Variable (SNCWV)

The seasonal normal value of the CWV for an LDZ on a day is the smoothed average of the values of the applicable CWV for that day in a significant number of previous years.

Shrinkage

Shrinkage refers to the gas which is lost from the transportation network. Shrinkage is a combination of Leakage, Own Use Gas and Theft of Gas.

Therm

An imperial unit of energy. Largely replaced by the metric equivalent: the kilowatt hour (kWh). 1 therm equals 29.3071 kWh.

Unaccounted for Gas (UAG)

Gas lost during transportation. Includes leakage, theft and losses due to the method of calculating the Calorific Value.

Uniform Network Code (UNC)

The document that defines the contractual relationship between System Users. The Uniform Network Code has replaced the Network Code and, as well as existing arrangements, covers the arrangements between all gas transporters.

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we are the network