SGN

Your gas. Our network.

Long Term Development Statement

2024


GAS


SGN

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Foreword

Welcome to our 2024 Long Term Development Statement (LTDS) – the first I've had the opportunity to introduce in my role as SGN's Director of Engineering and Network Strategy.

Jeremy Deveney
Director of Engineering
and Network Strategy

This annual publication enables us to inform and engage with our customers and stakeholders on the outcomes of the work carried out by our Network Capacity team to produce our gas demand forecasts and share our understanding of how demand is likely to change over the next ten years.

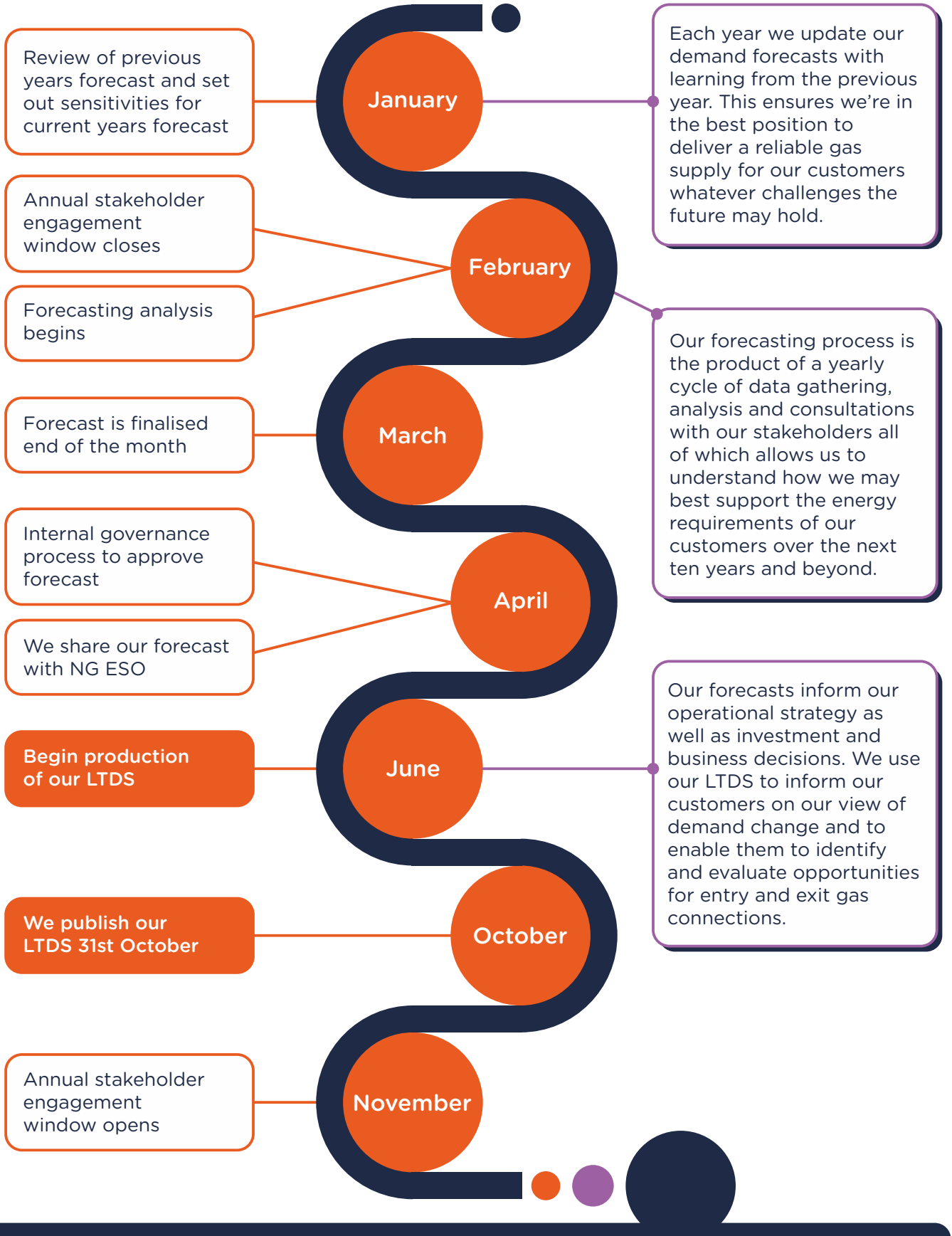
SGN is unique among the UK's gas distribution networks as we manage and operate our three networks within two national boundaries, governed by the central and devolved administrations. Regional geographic differences, as well as the influence of national and regional energy and economic policies, impact the gas demand forecasting methodology across the networks we operate.

There have been significant changes over the last 12 months which have the potential to affect customer energy usage across the UK. These changes include the election of a new central government and leadership change within Scotland's devolved administration. In addition, the National Energy System Operator (NESO) have begun taking up their new responsibilities which will include implementation of the new administration's ideas and policies. The result is a rich and evolving landscape for us and our colleagues across the UK's gas and electricity industry to operate within. As per our ongoing forecast methodology, where we review the previous year's forecast performance before beginning the next, we will assess the impacts of these changes on prevailing demand alongside the performance of existing and new legislated policy impacting demand when we begin the cycle again next year.

As part of our ongoing review and improvement of this publication, we've introduced a section this year which highlights how SGN will play a critical role in the UK's future energy mix and the vital work underway to ensure its net zero commitments are met. I hope you find this publication an interesting, informative read.

Please do reach out to the members of the team listed in **Appendix C** with any feedback which may help inform our forecasts and ensure our LTDS fully meets your requirements in understanding our forecast outcomes.

Forecasting annual cycle



Our LTDS is produced by our Network Capacity team. If you have any comments or suggestions on the publication please feel free to get in touch with the team at network.capacity@sgn.co.uk or contact one of our experts via the contact details in links and contacts.

Our operational footprint

Our gas networks are a vital part of the UK's energy system, ensuring the reliable delivery of gas across Scotland and southern England for direct use by our customers and including the generation of electricity. Our operational footprint enables us to engage with a diverse range of customers and stakeholders across our regions.

Scotland LDZ

Our Scotland networks distribute gas to 1.8 million customers. Including remote areas via our five Scottish Independent Undertakings (SIUs).

South and South East LDZs

Stretching from Milton Keynes in the north, to Dover in the east, and Lyme Regis in the west, including London boroughs south of the River Thames, our Southern networks distribute gas to 4.2 million customers.

We believe the UK's gas networks have enormous potential as part of a fair and affordable energy transition and as an enabler of net zero. Prioritising our customers' evolving energy needs informs strategic planning and management of our networks ensuring we are able to meet both our current and future customers energy requirements.

The forecast year in review

This section gives an overview of our 2023 forecast along with a brief outline of our 2024 forecast.

Our forecasts are developed using a detailed assessment of demand change which reflects on both historic demand patterns relative to the various influences on demand change and the impacts from new and existing energy policies. This helps ensure our forecasts accurately reflect our customers energy requirements as we play our part in the transition of the UK's energy sector to net zero.

Domestic customers make up 71% of all demand

The single largest group benefiting from our networks are our domestic customers with an average of 71% of total SGN peak demand going towards supporting their energy requirements.

Domestic demand is particularly impacted by changes in economic output with the cost of living and how much spare household income there is affecting how we heat our homes. In our forecast we refer to this as 'comfort levels'. Second to comfort levels is legislation related to energy efficiency and to a lesser extent the number of new homes which data shows are planned to be built in our areas over the ten year forecast period.

To gauge domestic demand as effectively as possible we assess these impacts separately before bringing the outputs of this together to form the final picture of demand change. Over the last year actual domestic demand continued to reduce across our areas at an average rate of 0.6% less than our 2023 forecast indicated. The primary reason for this was the continued pressure from increased cost-of-living impacting not only how we consume energy but the economy overall and a households available budget to spend on energy.

Recovery from cost of living impacts and growth in power generation are the two greatest influences on gas demand in our 2024 forecast

Our 2024 forecast shows domestic demand increasing over the 10 year forecast period with comfort levels during this time set to return to the higher 2021 levels earlier than our 2023 forecast indicated. The main driver for this being lower forecasted fuel prices. These assumptions are sensitive to the inputs particularly fuel price fluctuations but also potential legislative and regulatory changes due to the administration changes mentioned earlier. As a result we will be reviewing them carefully when we begin work on the forecast in March next year.

Our forecasts do not include energy policy which isn't legislated

Key to our forecast is our methodology relating to how we incorporate energy policies which impact demand. All current UK Government and devolved Scottish Government policies are assessed to determine their impact, with only those legislated at the time of the forecast used to create the outputs. Even then these inputs are appraised for performance and if appropriate scaled back to suit. An example of this are heat pumps which are targeted to deliver 600,000 installations per annum. However, this policy is currently severely underperforming and general consensus across all industry experts indicate this is unlikely to change without targeted intervention including additional funding and support. Our forecast therefore looks to deliver a more reasonable assessment of the impact of heat pumps and we use current install rates to determine their impact on demand which at the time of our forecast was at around 13,000 heat pumps replacing gas boilers per annum. This means that users of our forecast receive a more realistic view of demand based on data rather than where it could be if the policy was fully delivering as intended.

Scottish energy policy has seen changes that impact our forecast, reducing the numbers of new houses that can connect to our networks, therefore reducing our forecast by a small amount, however there are no new policies that have a material impact in England

We are somewhat unique amongst the GDNs as we supply gas into two different countries, England and Scotland, with the devolved government in Scotland often having a regionally specific perspective on how energy should be managed and net zero may be achieved. One example of this is the introduction of the New Build Heat Strategy (NBHS) which came into effect within Scotland in April 2024. The impact of this is projected to be a reduction in domestic demand in Scotland of 2.2% by the end of this forecast period in 2033. Whilst this legislation was scheduled to come into effect after our forecast was finalised its impact was included in our analysis as it had been legislated and is relevant to the forecast period as a result. However, the Future Homes Standard , the equivalent in England, was still under consultation and therefore is not included in our forecast.

The latest statistics available on the performance of central Government's updated energy efficiency scheme, ECO4, has shown lower performance than we anticipated last year. In England this has not been offset by the inclusion, nor the performance, of two new schemes which are intended to improve energy efficiency, the SHDF (Social Housing Decarbonisation Fund) and GBI (Great British Insulation Scheme). Due to the performance levels of ECO4 we've reduced the amount of retrofit thermal energy efficiency in our 2024 forecast compared to 2023 for both of our two southern LDZs and this resulted in a small increase in domestic demand. In Scotland, the performance of Home Energy Scotland's Grant and Loan Scheme launched in December 2022 alongside the ECO and GBI, has resulted in a small increase in retrofit energy efficiency which reduced demand by 0.6% compared to last year's forecast.

One area where the central Government's net zero policies have been strengthened is the Boiler Upgrade Scheme (BUS). In October 2023 the total budget for the scheme as well as the amount available to homeowners for replacing a fossil fuel boiler with a heat pump increased, with individual grants rising to £7,500. The result of this was boiler replacement rates nearly doubling and we have reflected this within our 2024 forecast. However, whilst this may seem significant, only half of the BUS uptake replaces boilers connected to the gas networks and the increased number of installations uses almost all of the allocated budget for the scheme. Without additional financial support from the government there is little potential for further increases in the rate of installations.

Scotland's equivalent policy mechanism to BUS is Home Energy Scotland Grant and Loan scheme. It's performance in the policy's first year was similar to that of BUS, once the lower number of overall households in Scotland is accounted for. Our view within the 2024 forecast is the Scottish initiatives will perform at similar levels resulting in a small decrease of 0.25% in domestic gas demand by the end of the forecast period.

In non-domestic demand sectors this year we've included less sensitivity to price increases than in 2023 with demand forecast to increase slightly as a result.

Power generation has continued to grow, particularly in peak demand. The largest power generator connected to our networks has been called upon to support the electricity systems at a far greater level than they expected or advised during our stakeholder engagement meetings. We've also seen growth in both connections and demand from smaller embedded power generators and short-term operational reserve sites connected to our networks. Overall the total number of these customers connected to our networks has increased in the last year by 32% with much of this growth occurring in support of the electricity networks due to an increasing reliance on renewable generation.

In summary, the demand reductions seen over the previous few years have now ceased and we are already seeing recovery. This is happening for two main reasons, an improving economy reducing cost of living and fuel prices and the policies intended to move the UK away from gas as a source of energy having little intended impact.

As is our methodology we will closely monitor the economic and demand recovery to ensure our analysis is reflecting prevailing conditions and revise our forecasts accordingly.

The next ten years

Our ten-year forecast provides a comprehensive outlook based on a detailed assessment of existing government legislation, historic and projected demand, as well as current, past, and forecasted customer behaviour.

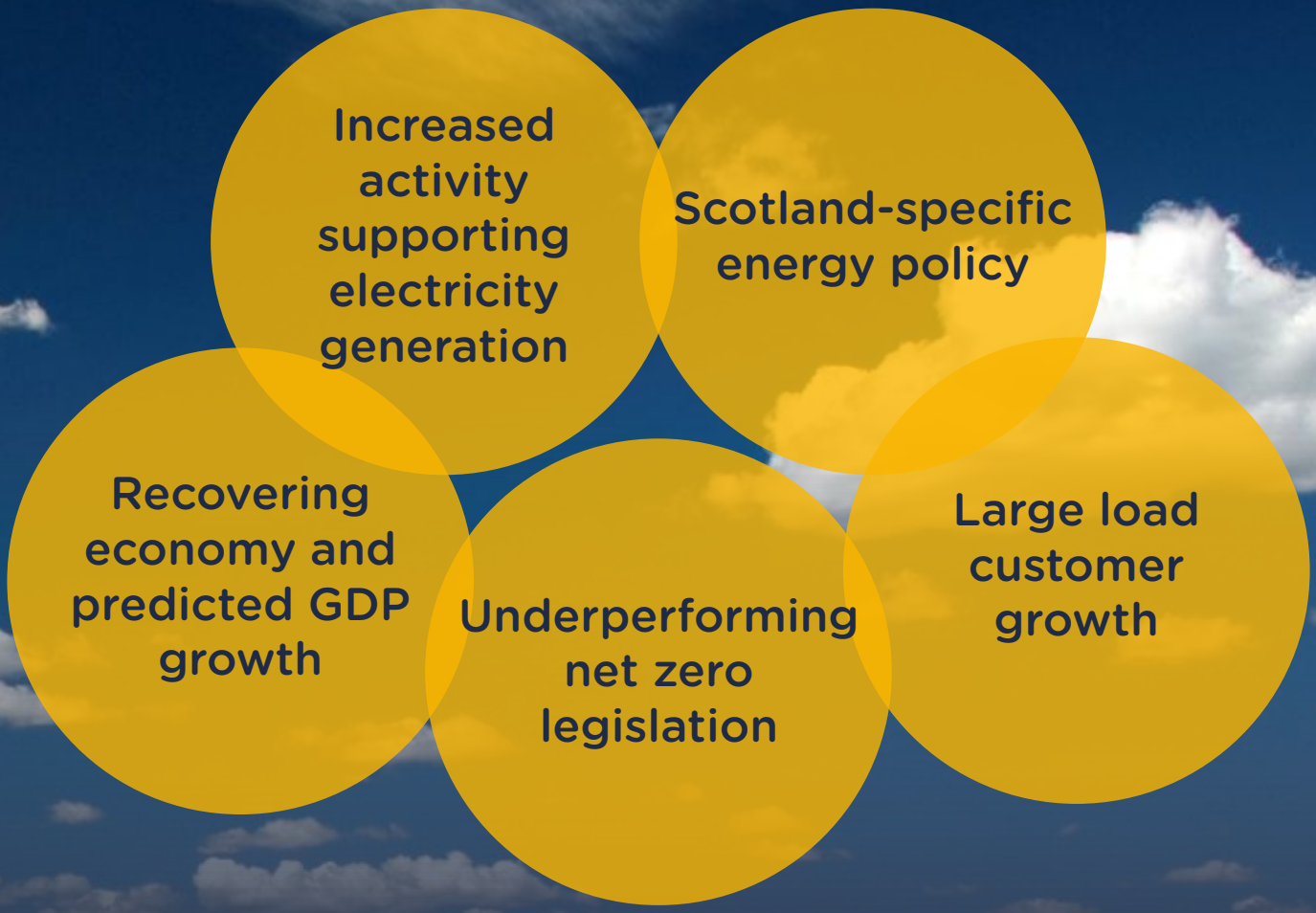
Annual gas demand is forecast to recover to 2021 levels by 2033 across all our three LDZs.

Annual demand Increases 13.1% by 2033

Peak day gas demand is forecast to increase steadily over the next ten years.

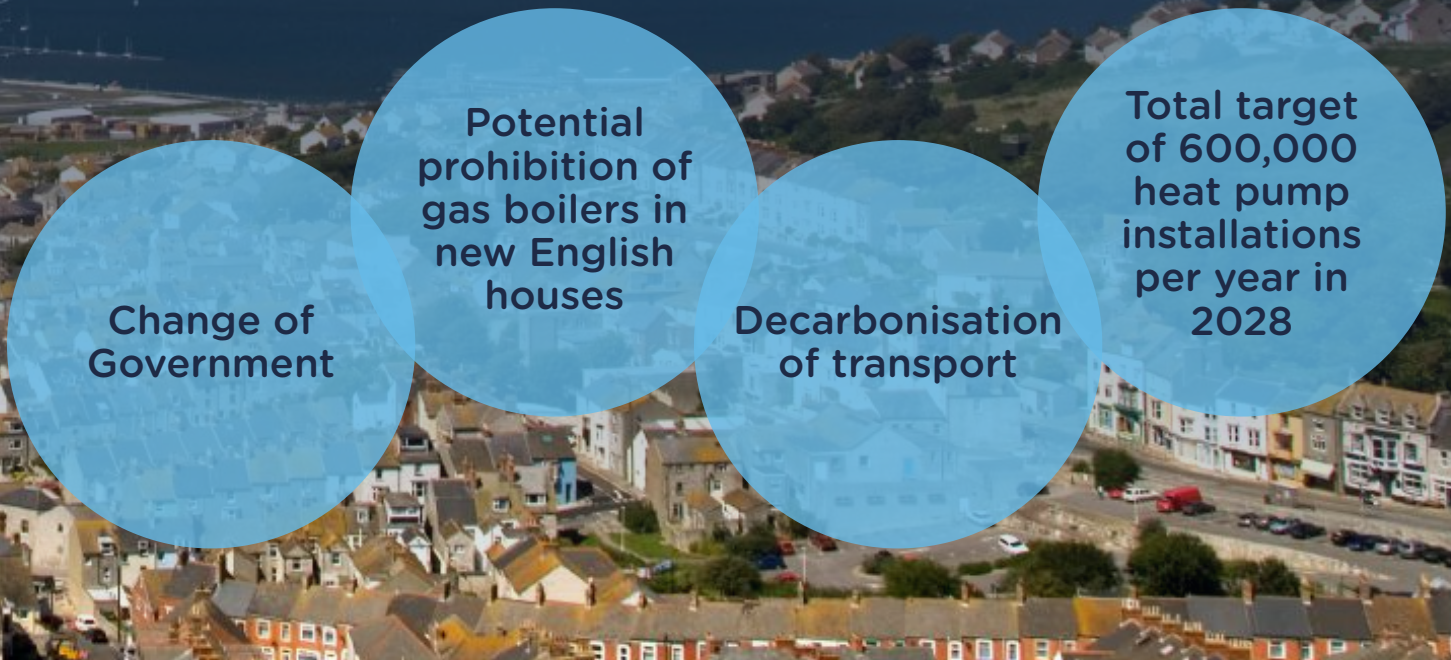
Peak day demand Increases 3.1% by 2033

The factors influencing our 2024 forecasts the most are ...



The following sensitivities are either not yet developed enough, are not performing as intended, or have been assessed as having insufficient impact are...

These include proposed legislation by both central and devolved governments as well as undeveloped technology intended to enable net zero such as CCS.



Impacts of cost-of-living increases

The reasons and effects of cost-of-living increases on demand over the last few years has been extensively detailed in our 2023 LTDS.

Domestic gas demand across our networks reduced by almost 15% in the preceding two years, nearly exclusively as a result of households reducing their comfort levels.

Cost-of-living change and impacts continues to exert the most influence on demand over the forecast period.

The improving economic conditions mean we are now forecasting demand recovery throughout the planning period until 2033.

The methodologies we employ to measure the economic impacts associated with demand change are proving highly suitable. For example, our assumptions of domestic demand averaged just 0.6% higher across our three LDZs than the 2023 forecast indicated may occur.

Domestic gas prices and other inflations are expected to relax as per our economic forecast, meaning gas demand from housing will continue to increase due to higher comfort levels, until they return to pre cost-of-living crisis levels between 2025 and 2028, depending on the LDZ.

We forecast a return to pre cost-of-living comfort levels between 2025 and 2028 across our LDZs.

There are uncertainties related to this, one being fuel prices and the assessment of Bank of England base rates. However, we'll continue to monitor these along with all economic indices to determine how they are driving this element of the forecast.

Power generation

Increasing renewable power generation has helped the UK successfully realise its ambitions to decarbonise our energy requirements.

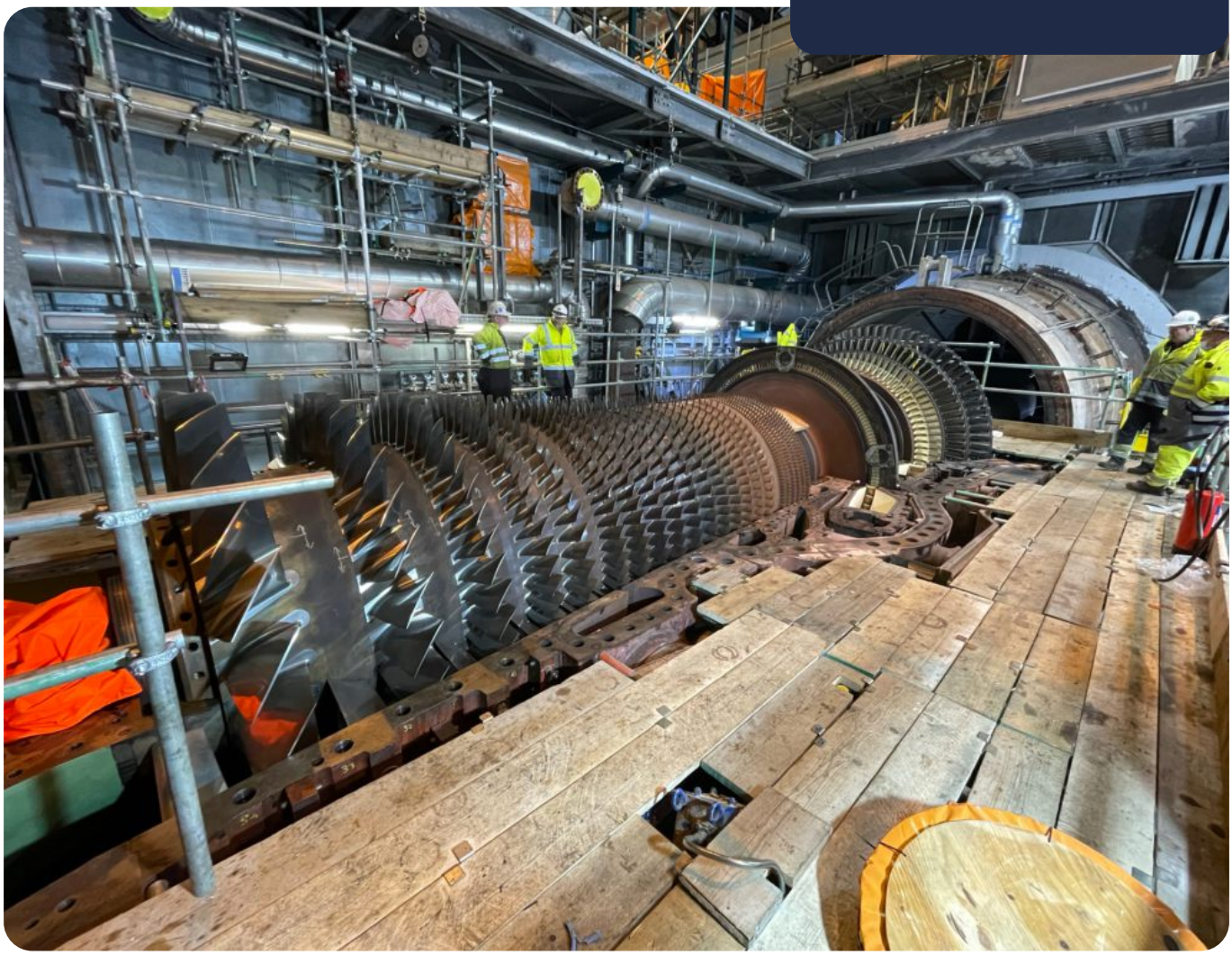
As the outputs from renewable generation is variable and difficult to control the increased amounts within the UK's energy mix, it creates a need for greater volumes of backup resources for when they are unable to generate and the electricity network operator can't move the renewable energy to where it is needed most due to system constraints.

Our gas networks are an important long-term backup option as they are quickly dispatchable and able to run for much longer periods than alternatives, such as batteries, when required. The flexibility our networks provide are enabling the growth in renewables and the UK's decarbonisation plans.

The largest power generator on our networks has increased its demand in each of the last four years.

More than doubling its requirements since 2020.

We saw a 32% increase in power generation customers connecting over the last year.



Domestic energy policy and low-carbon heating

The 2005 legislation requiring all new boilers to be high efficiency condensing models still holds the greatest influence on our forecasts among energy policies. As there are still many non-condensing boilers in UK households, efficiency improvements from boiler replacements still contribute significantly to our forecast. This includes efficiency improvements gained by replacing old condensing boilers with newer, slightly more efficient, boilers as the technology continues to improve. This remains the largest single energy efficiency component influencing our forecasts, reducing domestic gas demand by 2.7% over the forecast period, which is largely unchanged from previous years.

Boiler replacements remain the largest single energy efficiency component influencing the forecast.

Inclusion of two new energy efficiency schemes into the forecast (SHDF and GBI) has not offset the performance reduction of ECO.

Home Energy Scotland Grant and Loan Scheme has reduced domestic gas demand by 0.6% in this year's forecast.

Whilst the number of heat pumps replacing gas boilers has increased within the forecast, the overall impact remains low.

We continue to include the impacts of ECO in both our English and Scottish forecasts. In addition, this year we have included the impact of three new energy efficiency schemes, the Great British Insulation scheme (GBI) which includes England and Scotland; the Social Housing Decarbonisation fund (SHDF) which covers England, and the Home Energy Scotland Grant and Loan Scheme. In England, even with the addition of these schemes, the total amount of retrofit insulation is slightly lower than in last year's forecast.

In Scotland, the inclusion of the recent Home Energy Scotland Grant and Loan Scheme has increased the total amount of retrofit.

This is because the performance of ECO4 has been less than its predecessor, ECO3, despite GBI being quite successful overall. The SHDF is a different type of scheme, which has little impact on overall demand, as it concentrates on deeper house retrofit aiming eventually to largely decarbonise existing social housing. As many of these are older houses, and more costly to decarbonise, large parts of the SHDF budget are allocated to electricity generation and low carbon heating the budget

does not cover as many houses. So, while the scheme can have a large impact on individual houses, it only has a very small impact on domestic gas demand in our LDZs overall.

In summary, the devolved government's own policies mean Scotland continues to see higher energy efficiency measures compared with our Southern LDZs. The figures for the implementation of the Home Energy Scotland Grant and Loan Scheme have been evaluated and included in the forecast, and account for slightly higher retrofit energy efficiency compared to our English LDZs. As anticipated, it has been beneficial to Scottish homes, but has not had a significant impact on our overall forecast for the region. It has decreased domestic gas demand in Scotland by 0.6% compared to last year in the forecast. For England, the impact of retrofit in our forecast is 0.05% less than it was last year.

The main policy to incentivise replacement of fossil fuel heating with low-carbon heating in England is the Boiler Upgrade Scheme (BUS). In October 2023, the incentive and budget were both increased. The incentive increased 50% to £7,500 and the budget for the next three years was set at £1.5bn. While the BUS incentivises biomass heating and heat pumps, heat pumps account for 99% of all installations under this scheme.

The total potential from the budget for is for 200,000 boiler replacements over the next three years and only around half of the applications currently being made are to replace gas grid connected boilers.

Our forecast for BUS is based on the performance since the incentive was increased, which has experienced an increase of around 50% because of the revised incentive.

Scotland is not part of the BUS. It uses the Home Energy Scotland Grant and Loan Scheme to incentivise boiler replacements with low-carbon heating. Its performance has been evaluated separately, and our analysis indicates heat pump rollout is currently at a similar level for boiler replacements per household as England.

Compared to the amount of gas boilers, heat pump replacements numbers are low. The values quoted are also national figures, which we have scaled to the size of our networks. Total domestic gas demand reduces by only 0.25% in 2033 due to heat pumps replacing gas boilers.

We're monitoring whether recent offers from various energy suppliers may increase the uptake of the BUS and Grant and Loan schemes. Some companies are looking to make the total installed cost once incentives have been used comparable with a boiler replacement. How this may impact boiler replacements remains to be seen.

New build properties - Future Homes Standard and New Build Heat Standard

We have already covered elements of how domestic energy policy is impacting demand. In this section we will look at how two key aspects of energy policy have influenced our forecasts...

In Scotland, the New Build Heat Standard (NBHS) was legislated in December 2023 and came into effect in April 2024. This mandates heating in new houses must be zero-carbon.

New Build Heat Standard (NHBS) has been implemented in Scotland. This has led to a reduction of 2.2% in domestic gas demand compared to last year's forecast.

While a ban on installing gas boilers in new houses was imposed from April 2024, this refers to the application date of a building warrant. As a building warrant is valid for three years, our forecast assumes no new houses will be connected to the gas network from April 2027. This policy has a significant impact on our Scotland forecast this year, reducing domestic gas demand in the region by 2.2% compared to last year's forecast.

The Future Homes Standard had not been implemented when our 2024 forecast was completed, so has not been included in the forecast for our Southern LDZs.

In England, an interim Future Homes Standard was introduced in 2022 to increase thermal efficiency requirements of new houses. This has been included in our forecast since its introduction. The Future Homes Standard (FHS) 2023 consultation proposes that all new houses built from 2025 will not be able to connect to the gas network. It proposed two potential options for new houses, seeking views on these options. This consultation had not concluded when our forecasts were created; and at the time of writing, no results from the consultation have been published. As a result of the uncertainty around this, any potential impact of the FHS has not been included in this year's forecast. Should legislation materialise, it should be considered that there will be an inherent delay between legislation coming into force and all houses being built to these standards. This is due to transitional arrangements in the legislation and interpretation of when work on a new building has started. Our analysis concludes if legislation was in place in and effective from 2025, it is unlikely all houses will be built to this standard before 2027.

Smart controls

We annually review the impact of smart technologies, evaluating new advancements and monitoring the installation rates of existing improvements like smart meters and smart thermostats to understand their influence on our customers' energy usage.

The Smart Metering Implementation Programme, led by the Department for Energy Security & Net Zero, reported that by the end of March 2024, 35.5 million smart and advanced meters were installed in homes and small businesses across Great Britain, representing 62% of all meters. However, the same report also highlighted that the first quarter of this year saw an 11% downturn in installation rates compared to the same quarter last year, with the lowest monthly installation rate since March 2020.

The UK Government is targeting 80% of homes and 73% of small business are equipped with smart metered by 2025. Our forecasts indicate smart meters have a relatively small impact on gas demand. In contrast, smart heating controls, such as Nest and Hive, have the potential for more significant energy reductions when used alongside other efficiency measures. However, these smart controls technologies are currently not reaching their full potential, and we will continue to evaluate their impact within future forecasts.

Beyond the next ten years

The UK and Scottish Governments are committed to achieving net zero greenhouse gas emissions by 2050 and 2045, respectively. A crucial element of this transition is phasing out unabated natural gas, replacing it with low and zero carbon energy sources as well as renewables.

Decarbonising the UK's energy landscape is a complex challenge with no single solution and we are actively engaged in numerous projects aimed at understanding the future energy landscape, laying the groundwork for a sustainable, safe, and secure net zero future.

Biomethane

Biomethane is a green energy source produced using organic waste which can be low-carbon, carbon-neutral or even carbon-negative, depending on the production method.

We already do a lot to facilitate biomethane injection into our networks but we are working hard to increase capacity including streamlining our connection processes to enable increased opportunities for injection into our networks.

Hydrogen blending

Blending hydrogen with natural gas could deliver a significant carbon reduction without the need for extensive asset or infrastructure changes for network operators or our customers.

There are already several demonstration projects across the UK gas industry exploring blending 20% hydrogen into existing gas networks.

100% Hydrogen conversion

Hydrogen is a clean burning alternative to fossil fuels which has a wide range of applications across energy sectors, including heat, power, and transport.

We have a pivotal role in several large-scale demonstration projects, gathering evidence for network conversion.

Biomethane

Government figures show only 0.07% of available feedstock, including only 2.5% of the UK's available organic farm waste, is used to create biomethane making it a largely untapped low-carbon energy resource with enormous potential.

We have 42 biomethane plants connected to our networks, delivering clean heat to over 315,000 homes.

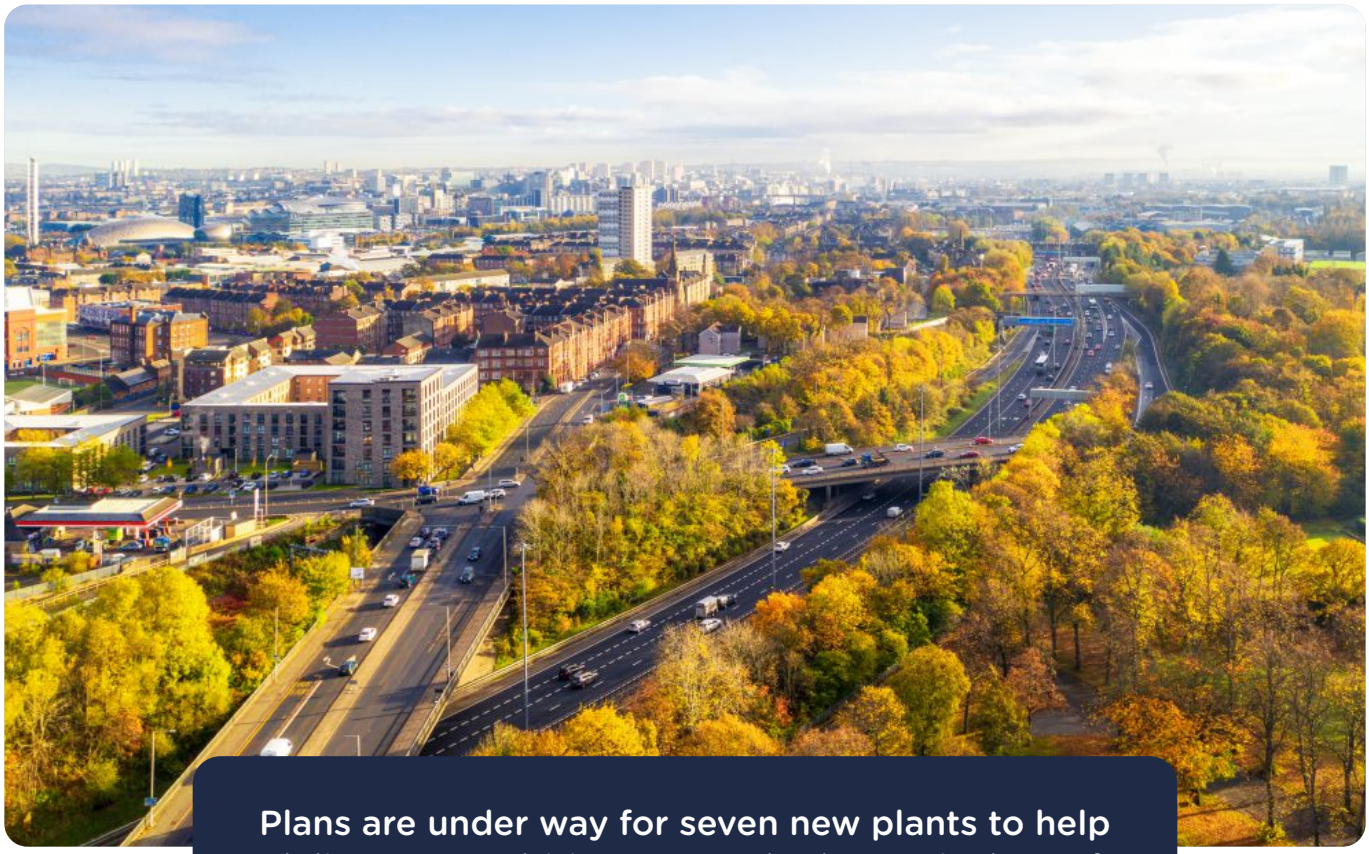
Increasing the amount of biomethane in our networks is central to our view of a greener future. We are working with several partners to increase network capacity for biomethane producers by identifying and overcoming the barriers to injection, enabling greater volumes of biomethane in our networks to reduce overall carbon emissions.

Reducing connection costs by standardisation of equipment

Improving capacity through smarter network control, upstream compression, and innovative technical solutions

Promoting the required changes to regulation and network codes

In March 2023, we proposed and secured approval for a modification to the Uniform Network Code (UNC) which enabled direct gas entry into the system via Independent Gas Transporters (IGTs). This change increases the options for biomethane producers to inject their gas efficiently into the networks, highlighting our commitment to innovation and sustainability in the gas sector to support the UK's net zero commitments.



Plans are under way for seven new plants to help deliver our ambition to supply the equivalent of 450,000 homes with biomethane by 2026

We manage the entire process on behalf of customers with support from the initial gas entry enquiry for new sites to connection including network planning, operational requirements, asset management and gas quality.

Support is also available with commercial and legal agreements. Once operational we liaise with plant operators annually to review capacity availability, site innovations, and operational issues to provide continuity of service throughout.

For further details or to progress any gas entry enquiries, please contact our dedicated Biomethane Connections team.

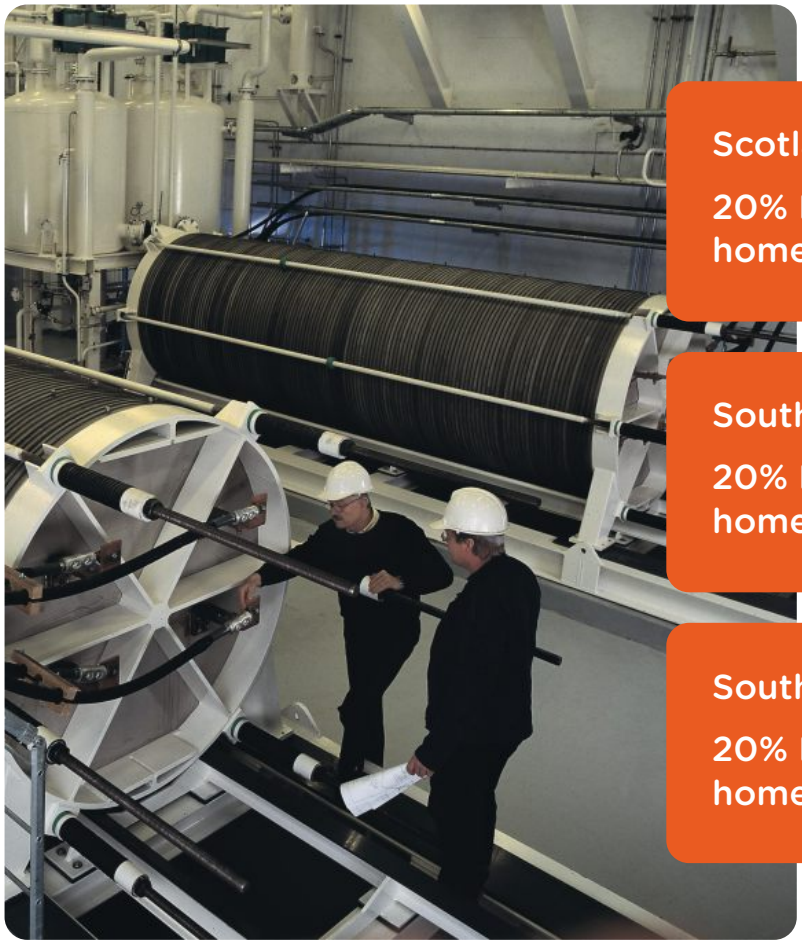
Details can be found in Appendix C (Links and contacts).

Hydrogen Blending

Hydrogen blending has the potential to deliver carbon emission reductions and is predicted to have both strategic and economic benefits, the UK government has committed to support the blending of up to 20% hydrogen into GB gas distribution networks[1].

Blending hydrogen into UK gas networks could stimulate the hydrogen economy by creating demand which will drive further investment in the sector. Using electrolysers to produce hydrogen from excess renewable electricity generation would allow improvements in whole energy system efficiency, creating cost savings for consumers.

The recently published results of phase 1 of the National Gas FutureGrid NTS project[2] are extremely positive, indicating no major blockers to the repurposing of the UK's gas networks to enable the transportation of a blend of natural gas and hydrogen.



Scotland LDZ potential:

20% H2 blend could provide 280k homes with carbon neutral energy.

South LDZ potential:

20% H2 blend could provide 320k homes with carbon neutral energy.

South East LDZ potential:

20% H2 blend could provide 170k homes with carbon neutral energy.

Total potential UK capacity at 20% blend is up to 60TWh pa.

Equivalent to heating around 5 million UK homes, saving around 10 million tonnes CO2 per year.

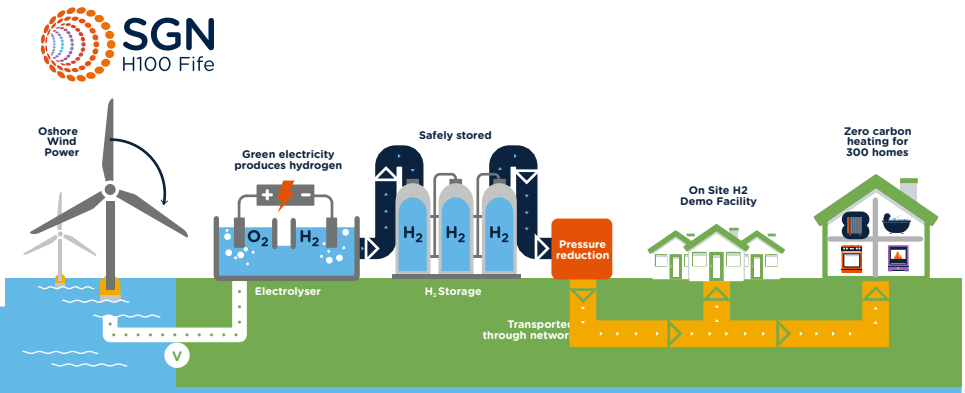
[1] Government hydrogen blending consultation(www.gov.uk/government/consultations/hydrogen-blending-into-gb-gas-distribution-networks)
[2] National Gas - Futuregrid (www.nationalgas.com/future-energy/futuregrid)

100% Hydrogen

The conversion of the gas networks to 100% hydrogen could enable transformation of our networks away from natural gas in a practical and deliverable way. This would maximise the repurposing of existing assets while providing choice to consumers. Conversion could also help manage electricity system constraints, allows for retention of connected customers, and supports hard to electrify sectors, such as industrial and commercial customers.

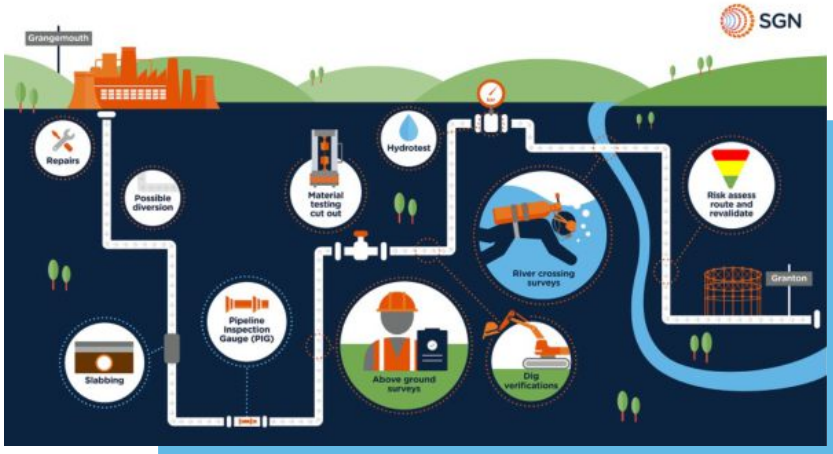
We aim to collaboratively provide evidence to enable the transition of the gas networks to 100% hydrogen through an extensive programme of R&D and demonstration projects. This will feed into government heat policy decisions, determining the future role of 100% hydrogen in the whole energy mix across the UK.

Key among these are:



H100

Our world-first hydrogen network in Fife continues to develop at pace. The demo facility is complete along with most of the 8.2km network and significant elements of the production and storage facility. This project should go live in Summer 2025.



LTS Futures

Our groundbreaking project to repurpose a 30km LTS pipeline for hydrogen transportation is progressing well.

Having undergone extensive surveying and testing the pipeline is ready for operation and the 1.2km hydrogen supply line required to start live trials is currently in construction.

Multiple Occupancy Buildings

MOB's account for 21% of UK domestic heating demand and face specific challenges regarding heating decarbonisation.

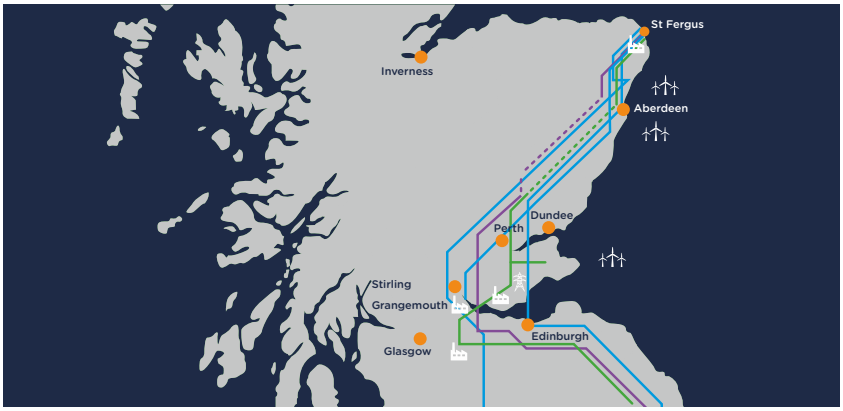
We are part of a collaborative study across the gas industry gathering evidence to assess the feasibility of hydrogen heating within this type of housing.

H2 Caledonia and H2 Connect

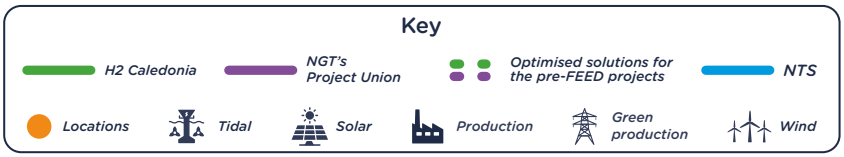
These system transformation pre-FEED projects are designing and costing new hydrogen backbones across our Scotland and South LDZs.

This will provide a feasible pathway to connecting potential hydrogen demand, production and storage across both these areas while paying particular attention to security of supply and the phased conversion of the networks.

H2 Caledonia (Scotland)



H2 Connect (Southern)



For more information on these projects please visit:
https://sgn.co.uk/about-us/future-of-gas

More detail

This section, along with appendices A and B, provides a more in-depth view of the information and econometric assumptions used to develop our forecasts. Please get in touch if you would like to discuss the forecasting process further, or feel we've not covered everything here. See contact details on page 49.

Regulatory obligations

We produce our LTDS in accordance with our Gas Transporter Licence and Section 'O' of the Uniform Network Code Transportation Principal Document obligations. In addition, the Uniform Network Code Offtake Arrangements document sets the framework for exchanging the necessary information to assist transporters to generate long-term demand forecasts. The publication of our LTDS forms part of this process.

This publication provides our customers an overview of our ten year forecast of annual and peak day gas demands which we use in the management of our gas networks.

These forecasts' primary function is to ensure we maintain our 1 in 20 licence obligations, ensuring our domestic customers can benefit from an affordable, safe and reliable supply of gas.

Forecasting process

We work with expert industry partners to develop our annual forecasts. The starting point is actual demand data from the previous year which is analysed along with information obtained from recognised industry sources. The results are tested against our previous year's forecast to improve accuracy year-on-year. This gives us greater confidence when planning work on our networks and the suitability of investment decisions we make on behalf of our customers.

This forecast methodology continues to prove extremely reliable, ensuring we're able to keep the gas flowing even during more challenging times of unusually adverse weather, such as in late February and early March 2018 and more recent cold periods during early 2021 and late 2022.

Validating our 1:20 peak day

Validation of our peak day assumptions requires extreme cold weather events to test the analysis against. However, there have been relatively few periods of weather conditions approaching peak-day demand in recent history.

We use a 60-year weather dataset to establish 1 in 20 peak weather conditions, with the last 20 years used to establish potential peak demand conditions, with adjustments for changes in annual demand.

Particular focus has been paid to cold periods of 2010, 2011 and 2018 for this work. The cold periods of 2018 have been used to calibrate our peak demand forecasts. This has been corroborated with demand during the cold weather periods in 2021 and late 2022, which also had some notably cold days. The most recent coldest periods of early 2024, were not as cold as those of 2021 and 2022.

Peak demand continues to be calibrated against our previous peak demand forecasts.

Improving our forecasting process

We recognise while our forecasting regime has served us and our customers extremely well, the UK's energy infrastructure will be undergoing significant changes to facilitate a low-carbon future and this requires us to review and revise the role we will play within the energy mix. In recognition of this, we continue to increase our engagement year-on-year with our customers and industry partners, including other GDNs and National Gas. As part of this we continue the work started last year on appraising over 400 customers' demand patterns. This year, we have also extended this workload to better

understand non daily metered embedded generation as part of our continuous improvement.

Each year, we begin the forecast by reviewing the performance of the previous year's forecast against the year's actual demand. This comparison helps establish a suitable start point for the subsequent analysis whilst informing weighting factors for the various elements of the forecast. An example of this is in 2023 we forecast domestic demand to reduce by 3.5%, actual demand reduced by 4.0%. When we look at the underlying reasons for this difference, we see households using slightly less energy to suit prevailing cost constraints and we then adjust future assumptions accordingly.

Our review of domestic customers returning to 2021 comfort levels has shown it to occur around two years earlier than in our 2023 forecast. This is a result of fuel prices decreasing at a greater rate than our analysis indicated last year. The differences of when this will occur across LDZs remains unchanged however with customers in the South East LDZ returning earlier than our South LDZ and Scotland LDZ being the last.

Excluding power generation, non-domestic demand did not reduce as expected. Our engagement across industry and with other GDNs concluded this was a nationwide phenomenon, with demand not tracking prices in the way history has shown. We have reduced the impact of price for this element within our 2024 forecast. This has resulted in slight demand increase for this sector in the 2024 forecast.

Regarding power generation customers, their usage in 2023 was generally in line with our forecast assumptions so this element of the forecast remains largely unchanged for 2024. One exception to this is the largest power generation customer in our South East LDZ has once again increased their usage which has been reflected within this year's forecast.

Our ten-year forecast is based on current energy markets, policies, legislation and incentives, including change which we know to be happening rather than change which may occur. The result being our networks are planned utilising known inputs whilst avoiding speculative assumptions.

UK view

Readers looking for an understanding of the UK's overall energy supply position and security of supply assessment can refer to National Gas for its Gas Ten Year Statement (GTYS)[3].

Demand forecasting process

Here, we delve a little deeper into how annual demand based on weather corrected throughput numbers changed in 2023 and how we approached our 2024 forecasting process.

As you read this section, please be aware when we talk about our forecast it will generally relate to the current year ten-year forecast. Also, in this section when we refer to our networks, we will generally reference our Scotland and Southern areas although for the purpose of regulatory reporting we are uniquely required to discuss our local distribution networks (LDZs) individually. So, you'll see Southern shown separately as 'South East' and 'South.

Please also note the changes shown in the following review of domestic, commercial and industrial gas demand have been corrected using the latest Seasonal Normal Composite Weather Variable (CWV).

0-73 – Domestic

In the decade prior to the cost-of-living crisis, domestic demand changed little overall, reducing by less than 1%. During this period, energy efficiencies introduced for boilers more than offset any increased demand from new houses, lesser changes influencing demand were those from retrofit insulation and improved heating controls.

As high energy costs and other inflationary pressures created a cost-of-living crisis in 2022, demand reduced by a further 10.6% throughout 2022 and an additional 3.5% in 2023 as a result of impacting both main winter heating periods, Q1 and Q4 2023 compared to just Q4 of 2022.

The cost-of-living pressures began to ease from their highest levels late 2023 and demand was not curtailed as much as it would otherwise. This was largely due to moderate reductions in domestic gas prices and other improving economic factors.

Our analysis carried out in March 2024 indicates economic pressures are set to continue to ease with gas prices slowly reducing as inflation returns to the Bank of England's target of 2% in June 2024. However, we recognise the higher Bank of England base rate may offset this to some degree as homeowners renegotiate mortgages.

Scotland LDZ: Domestic demand decreased by 2.4%, primarily driven by the behaviour change element which accounted for 2.3% of the overall reductions. New house connections added 0.7% to demand, while energy efficiency

[3] https://www.nationalgas.com/media/publications/gas-ten-year-statement-gtys

improvements led to a 0.6% decrease. Efficiency improvements in Scotland are slightly higher than those in our southern LDZs, reflecting the Scottish Government's distinct approach.

South East LDZ: This LDZ experienced the largest change, with domestic demand reducing by 5.3%. Behaviour change was the key driver and resulted in a 5.4% reduction. Other factors influencing domestic demand almost cancelled each other out, with efficiencies from boilers, heating controls, and thermal improvements decreasing demand by 0.3%, while new houses increased demand by 0.4%.

South LDZ: Domestic demand in the South LDZ decreased by 3.4%, aligning with our forecasts. The primary driver of this reduction was behavioural changes, which led to a 4.5% decline in demand. However, this was partially offset by the highest increase in demand from new houses, adding 1.4% to the total demand. Additionally, the impact of energy efficiency improvements was consistent with those observed in the South East LDZ, contributing to a 0.3% reduction in demand.

73-732 – Non Domestic

Commercial demand across all LDZs continues to respond minimally to price changes. While we have seen demand growth in this sector resume, it has not yet reached pre-pandemic levels. Our forecast for this sector is centred around the impact of non-price economic metrics, particularly commercial output, which significantly impacts demand in this sector.

Scotland LDZ: Demand increased by 1.3% in 2023, in line with a 0.9% rise in regional service sector output. This growth reflects the overall increase in commercial activities and service outputs in the region.

South East LDZ: Demand increased by 2.3% in 2023, in line with a 1.3% increase in service sector output. The rise indicates a steady recovery in commercial demand as the region's economy strengthens.

South LDZ: Demand remained stable, increasing by 0.2%, in line with regional service sector output. The stability in this LDZ highlights a consistent demand pattern despite broader economic fluctuations.

>732 – Non Domestic

The >732 load band comprises a wide range of industries. As a result, the factors which go into understanding changes in demand are complex with wider variations between LDZs. Embedded power generation customers and very largest loads create the biggest influence on this sector.

Small industrial: In this sector there has been a general trend of small decreases in gas demand over recent years. This is primarily due to improving energy efficiency within the manufacturing sector.

Scotland LDZ: Small increase of 0.6%, as a result of increased activity in embedded power generation.

South East LDZ: Reduced by 2.3%

South LDZ: Reduced by 1.2%

Large industrial: This sector includes our largest daily metered sites. General trend is one of growth except in Scotland where we have very little large industrial demand.

Scotland LDZ: Demand reduced for daily metered sites by 2.8% in 2023.

South East LDZ: Daily metered demand increased by the same amount as last year, 5.5%. This was mainly driven by our largest loads and, significantly, increases at our largest power generation customer.

South LDZ: Daily metered demand increased by 4.8%.

Approach to the forecasting process

Our approach to the forecast is largely unchanged from previous years. We're continuing to find the current methodology is working very well. We use a detailed, granular, bottom-up approach wherever possible, particularly for the domestic sector, where we explore changes in demand using several factors. This allows us to link historic demand changes to specific elements of the forecast to benefit from a clearer picture of what's occurred and why. The most influential elements are boiler efficiency, new houses, behaviour change, thermal insulation and any move away from gas as a heating source, for example heat pumps.

Looking at specific elements individually before bringing them together improves our understanding and confidence in the outputs of our forecast. This is particularly important as it allows us to understand better how our analysis compares to the wider industry view of demand including those which look at what might need to be done to help the UK decarbonise.

The granular bottom-up approach has enabled us to isolate reasons for the changes in our customers' behaviours and assess where this has worked well and what needed changing within the forecast. It has also helped our engagement activities by enabling us to articulate what has occurred more easily.

This approach has been predominantly applied to our domestic forecasting and increasingly our forecast of specific medium to large loads as we engage further with those customers whose pattern of demand are deemed unusual or have the capacity to disrupt the accuracy of the forecast. Where possible, this has been extended to 'smaller' individual customers and customer types which have a larger bearing on our network operation and planning due to either their location, flow profile or type of industry. We've created a dataset of around 400 customers where these parameters apply. This is particularly relevant for new power generation sites as they have a relatively high impact on demand due to their variable flow patterns. The bottom-up approach covers around three quarters of our total forecast demand.

For the last two years, in our appraisal of the best way to incorporate the impacts from the increased cost-of-living and fuel prices on demand, we recognised that at peak weather conditions, comfort requirements will generally override economic considerations with households looking to maintain heat levels within the home. Therefore, we incorporated a degree of smoothing to remove the worst of the impact from the econometric analysis on domestic demand. We are continuing this approach this year. An example of this is shown in Figure 2 for illustration.

In this year's review of the 2023/24 forecast, there weren't any days quite cold enough to help validate our assumptions on this, but last year's corroborative evidence of the colder days experienced in December 2022 remain relevant.

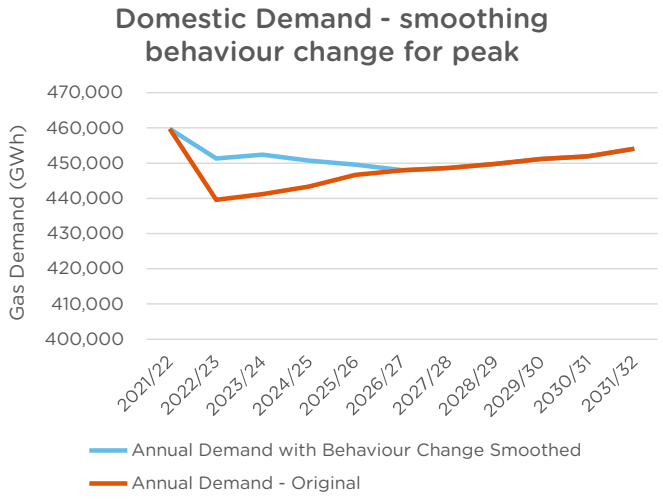


Figure 1: Example of smoothing on peak demand

Inputs to forecast

This section provides a general overview of the key inputs to our forecasts. These inputs are a combination of economic indicators as well as the specific elements of the bottom-up forecasting approach which are particularly dominant within the domestic sector. Economic indices have a higher impact than in the last couple of years as large increases in gas price and the cost-of-living have a greater bearing on all sectors in this forecast, especially the behaviour change element of domestic demand which we determine via econometrics.

Domestic demand

Domestic demand contributes to around two thirds of our total demand. As with previous years, we continue to separate the individual elements impacting gas demand to see how they have changed historically and why. We then forecast each element individually over the ten-year period at an LDZ basis.

We continue to engage in extensive research on the domestic elements gathering information from DESNZ, English and Scottish housing surveys, Ministry of Housing, Communities & Local Government (MHCLG), Home Energy Scotland, Heating and Hot water Industry Council (HHIC) and the Energy and Utilities Alliance, alongside other sources.

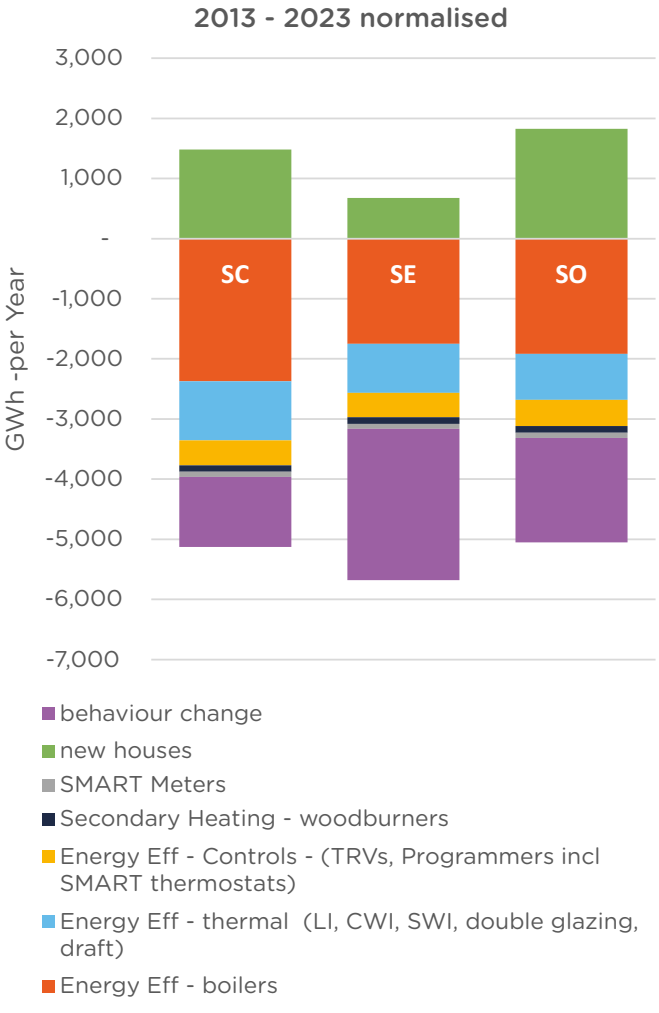


Figure 2: Ten year view of domestic demand change

The reasons for gas demand changes over the last ten years can be seen in Figure 2. The measures shown within the graph are those we've included within the analysis to support the forecasts, with the numbers of houses in our South East and South LDZs being scaled to those in Scotland to enable a comparison.

The two main elements which stand out are, the high impact of behaviour change and boiler replacements over the last decade, with legislated boiler replacements reducing gas demand considerably over this period , more than all other efficiency measures. Notably, the behaviour change element which has gone from positive to negative as increases in comfort levels over the past ten years have reversed over the last two years due to cost-of-living pressures with comfort levels in 2023 now lower than they were ten years previously.

While the underlying message is the same for all LDZs, there are specifics to each. Most notable of these continues to be the higher levels of energy efficiency insulation in Scotland due to the way the devolved government prioritises these measures.

Energy efficiency in the home

Energy Company Obligation (ECO)

The Energy Company Obligation (ECO) is the main government funded energy efficiency scheme in Great Britain, aiming to tackle fuel poverty and reduce carbon emissions. It follows the Carbon Emissions Reduction Target (CERT), which was in place from 2008 to 2012. While CERT made a major contribution to increasing retrofit insulation measures in GB houses, ECO has been less effective. This is largely because CERT was applicable to all GB houses, whereas ECO has a smaller target market, with only households in receipt of certain benefits being eligible.

Each iteration of ECO has performed worse than the previous. The latest iteration, ECO4, began in early 2022 and continues to deliver less than its precursor ECO3, meaning that the total amount of retrofit efficiency measures from ECO in this year's forecast is lower than last year. In 2023, there were 7,760 installations of cavity wall insulation via ECO4 compared to 20,949 in 2022. ECO therefore continues to have a small impact on our forecasts. As a result, our forecast for energy efficiency overall via ECO is lower in 2024 than it was in 2023.

The chart below shows the total amount of solid wall insulation (SWI), loft insulation (LI) and cavity wall insulation (CWI) delivered by ECO per year since 2013.

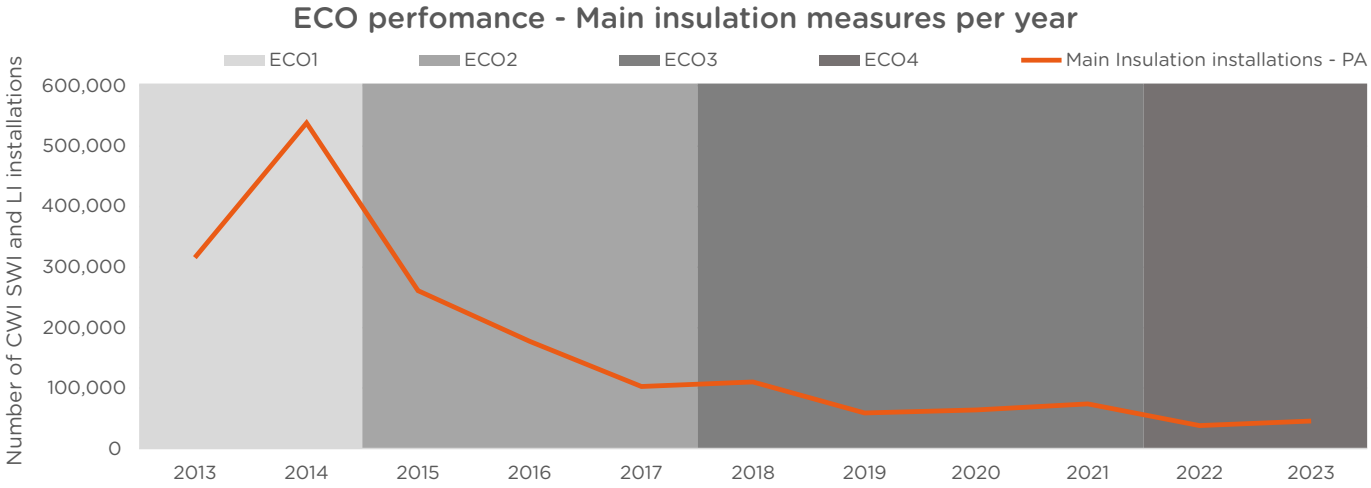


Figure 3: ECO performance

Great British Insulation Scheme (GBI) and Social Housing Decarbonising Fund (SHDF)

Both these schemes were introduced as supplemental initiatives to ECO. The Great British Insulation Scheme (GBI) began at the end of March 2023 with the aim of ultimately saving householders money on their energy bills by improving the least energy-efficient homes. This £1 billion initiative is scheduled to run until March 2026 helping around 300,000 households, specifically targeting fuel poverty and reducing energy bills.

The Social Housing Decarbonising Fund (SHDF) aimed at whole house refits is now delivering enough efficiency measures to be included within our forecast inputs. However, the SHDF has had a minimal impact in the forecast as the measures are generally for whole house retrofits and therefore have a

high cost, high impact per house and apply to very few properties which tend be hard to treat homes, further restricting the impact of the allocated budget.

The most popular GBI measure reported by government has been cavity wall insulation (CWI) with 2,138 cavity walls insulated in 2023 nationwide.

The total amount of associated energy efficiency within our forecast for both these schemes is still less than the shortfall in performance of ECO. This means the allowance within this year's forecast is less than the already reduced levels for ECO compared to last year's forecast.

Home Energy Scotland Grant and Loan Scheme

Grant funding became available alongside loans in December 2022. The grants offer up to £7,500 for zero direct emissions heating and £9,000 for households which qualify for the rural uplift and are generally off the gas grid, with a further £7,500 for energy efficiency improvements. This can result in funding of up to £15,000 in total. It is important to note that the maximum of £7,500 for energy efficiency improvements is only available for solid wall insulation while loft, floor or cavity wall insulation qualify for grants of £1,500. Additionally, an interest-free loan of up to £7,500 is available for both zero direct emissions heating, such as heat pumps, and energy efficiency measures.

The scheme has received over 6,000 applications as of August 2023, with over 1,900 funding offers issued for heat pump installations during this period. These figures represent the total number of heat pumps replacing other heating systems, with only a proportion replacing gas boilers. Having monitored the schemes performance, we forecast its total impact to be a 0.4% reduction in total domestic demand in our Scotland LDZ by the end of the forecast period in 2033.

Boiler Upgrade Scheme (BUS)

The Boiler Upgrade Scheme (BUS) offers financial assistance with switching to low carbon heating systems such as air and ground source heat pumps as well as biomass boilers, helping the UK reach its target of replacing 600,000 gas boilers with heat pumps annually by 2028. This initiative follows the conclusion of the Renewable Heat Incentive (RHI) in March 2022, which had previously incentivised the generation of heat from renewable sources since November 2011.

In October 2023, the incentive amount for new air-sourced heat pumps in households in England and Wales was increased from £5,000 to £7,500, and for ground source heat pumps from £6,000 to £7,500. Additionally, in December 2023 an additional £1.5 billion funding was announced for the period 2025/26 – 2027/28, tripling the budget for the current spending period. This extra funding could support the installation of 200,000 heat pumps over the three-year period, though not all will replace mains gas boilers.

Our assessment of BUS shows the increased incentives has improved performance of the scheme considerably. We have forecasted that the BUS budget will be utilised. It should be noted only around half of the incentivised heat pump installations are replacing gas boilers. We will continue to review the scheme's performance and the impact on gas demand.

Boilers

The UK Government's mandate in 2005 for all new gas boilers to be higher efficiency condensing models has made this the element of greatest reduction in gas demand in the domestic sector. There's still a large number of non-condensing boilers as well as older less efficient condensing boilers in use across our networks leaving reductions still to be gained in gas demand from them being replaced by more modern condensing variants. This is reflected in our forecast and remains the single largest element reducing gas demand across all our networks.

Secondary heating - wood burners

Data shows sales of wood burners in the UK increased by 25% in the last 12 months. However, they still have an almost unnoticeable impact on the forecast as there are still relatively few installed, and for gas-heated houses they are used mainly for secondary heating, offsetting gas demand by only a small amount. We are also aware of new legislation introduced to limit the particulate emissions associated with wood burning stoves, meaning these are unlikely to significantly affect gas demand in the foreseeable future.

Smart meters

There were 35.5 million smart and advanced gas and electricity meters in homes and small businesses in Great Britain at the end of March 2024. This accounts for 62% of all meters . Smart meters can provide good energy and cost savings from electricity demand especially as part of a connected home where new systems such as batteries and solar PV are installed. However, there is very limited impact on gas demand. This has been the conclusion of our analysis of customer trials, engagement with National Grid ESO and other GDNs. As a result, smart meters' influence on gas demand

continues to be very low in our forecasts for all three LDZs.

New homes

This year's forecast shows a significant change in the impact of new houses on Scotland's LDZ compared to last year, while other LDZs remain relatively unchanged. An explanation as to why this is can be found on the next page:

The New Build Heat Standard (NBHS) legislation, effective from April 2024, prevents new houses in Scotland from connecting to the gas network unless they've already applied for a building warrant. Our interpretation of the timelines and allowed lifespan of the warrant structure means we forecast no new houses connecting to our networks from April 2027 in Scotland, leading to a 2.2% reduction in total domestic gas demand by 2033.

In England, the FHS (Future Homes Standard) is not included in this year's forecast, as it was still not legislated at the time of the forecast, and at the time of writing does not appear any closer to legislation. It also remains unlikely it will complete in time to be in legislation to impact houses built in 2025 as originally intended.

Even if legislated, our understanding of the current proposed rules concludes it is unlikely to affect houses built before 2027. Therefore, any impact from the introduction of this policy, should it come into place, would be relatively low for this forecast period. Our updated data for new houses in our Southern LDZs reflects almost no change to this element of the forecast.

Behaviour change

The decade prior to 2022 saw a general increase in prosperity. While there were variations from year to year, there was an overall increase in comfort levels, or the temperature to which people heat their homes, broadly relating to an annual increase of 0.1C on average temperatures.

This changed in 2022 due to large increases in the cost-of-living and gas prices resulting in reductions of domestic gas demand of over 10% in 2022. Total reductions amounted to approximately 15% in 2023 compared with 2021.

Towards the end of 2023, economic conditions began to improve, and domestic gas prices started to reduce from their highest levels. Our forecast indicates this easing of economic pressures on households will result in domestic gas demand recovering from 2024 onwards. Our 2024 forecast has lower gas prices in the short to medium term than 2023's the result of which is a faster rate of recovery than previous forecast with all LDZs returning to 2021 levels between 2025 and 2028.

Economic inputs

For the areas of our forecast which use econometric forecasting, we assess how changes in historical demand compare to changes in historic economic indices to establish a best fit relationship between them. We then forecast each economic input applying the historic relationship to these indices to establish suitable demand projections for the economic forecast. This is carried out multiple times for each sector of demand on an individual LDZ basis resulting in 12 separate economic forecasts. The review of economic inputs and their potential relationship to demand includes selecting only those which demonstrate the strongest relationship to historic demand. The main economic inputs we assess for inclusion in our forecasts are detailed below.

Gas prices - wholesale and retail

Wholesale gas prices fell steeply between 2022 and 2023 with the average price for 2023 being less than half of what it was in 2022. Since then, prices have stabilised.

In the winter of 2023/2024, gas prices were around 85p/therm, roughly 55% of the previous winter's price. In summer 2024, up to July, gas prices were approximately 10% lower than the same period the previous year.

These reductions occurred earlier than forecasted last year leading to lower price projections for the initial years of our 2024 forecast while remaining unchanged for the later years.

We use an historical linkage to domestic, commercial, and industrial gas prices to create price forecasts for these sectors. This has resulted in prices in all sectors remaining higher for a little longer than actual wholesale prices. As a result, our forecast has reducing prices in the first few years before steady but limited increases from mid to long term. The domestic gas price forecast is shown in Figure 4 for reference.

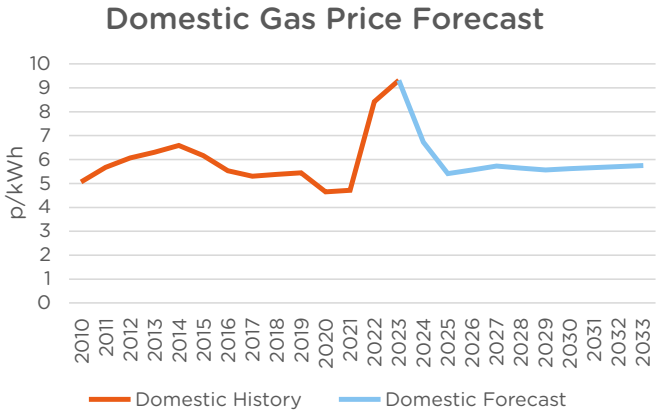


Figure 4: Domestic fuel price forecast

Household disposable income (HHDI)

Household disposable income (HHDI) has a significant influence on domestic gas demand. Our annual review of this input continues to find a strong relationship to the behaviour change element of domestic gas demand. As in previous year's we have used the latest Office of Budget Responsibility (OBR) central forecast from the OBR Economic and Fiscal Outlook.

Our assessment in 2024 indicated growth of 0.3% in 2024 rising to 2.1% in 2027 with that level of growth to continue for the rest of the forecast period out to 2033.

It should be noted that HHDI is only one element of the cost-of-living. Gas prices have a higher impact on this element of the forecast and these are accounted for separately to avoid cross influence of non-connected factors within the analysis.

GDP

The Office for Budget Responsibility (OBR) is referenced as a source of forecast data for GDP using their outputs from the latest Economic and Fiscal Outlook for this element of the forecast.

The OBR's November 2023 report showed a drop of 10.4% in 2020, after ten years of growth at an average of 2% p/a.

In the following two years there was growth of 8.7% and 4.3% respectively, however this growth is almost all recovery back to 2020 levels as opposed to improving economics. They show reduced levels of growth in 2023 of 0.6%, then forecast this to slowly increase up to 2.0% by 2027.

From then onwards, the OBR forecasts increases of 1.7% pa until the last year of their forecast in 2029. This trend has been used for the remainder of our forecast period out to 2033. See Figure 5. Note: OBR chart shows cumulative % changes compared to the 100% in the 2019 Q4 base period)

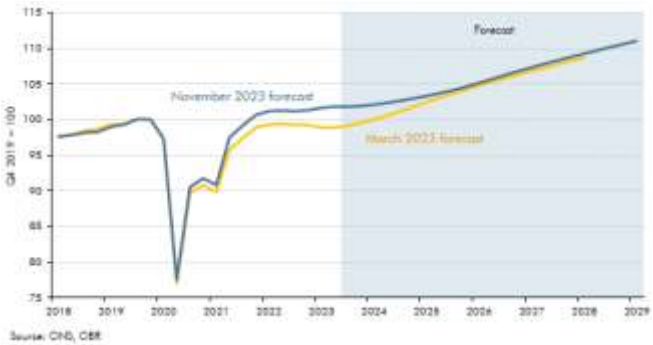


Figure 5: GDP Forecast.
(source: Office of Budget Responsibility)

Inflation

Inflation has a significant influence on all areas of demand even without the recent cost-of-living increases. After two years of very high inflation, levels reduced to government targets of 2% in June 2024.

We recognise and assess the risk from double counting the impacts of inflation within our forecasts. The result is inflation as an individual element is excluded from our economic analysis in favour of those areas where inflation is already accounted for, such as gas price and household disposable income.

This will be monitored each year to ensure it remains a suitable approach to our economic forecasting.

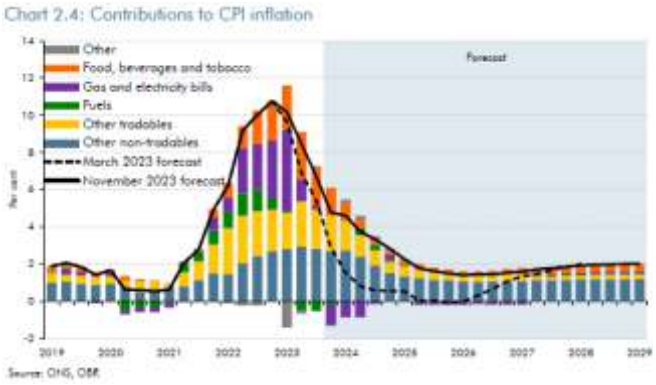


Figure 6: Contribution to CPI inflation
(source: Office of Budget Responsibility)

Service sector output

For our assessment of service sector activity we use a combination of national and regional service sector outputs, these are all sourced from the Office for National Statistics (ONS). We look at the relationship to historical indices as part of the development of the econometric forecasting process using the most relevant National or Local index for each LDZ based on regression of the historical indices. Nationally, the service sector output is forecast to increase on average 0.5% per year over the forecast period.

Manufacturing output

We use a combination of national and regional service sector outputs sourced from the ONS for this sector. As with the service sector, we assess both local and regional indices for our assessment of the econometric relationship per LDZ, forecasting large and small manufacturing demand separately. For the large manufacturing sector we find national indices show the best relationship to demand, and for the smaller manufacturing sector we find a combination of both national and regional indices match demand best. This combination can vary between LDZs. In line with service sector output,

our forecasts of manufacturing output are based on regression of historical indices. Nationally, the manufacturing sector output is forecast to increase on average 0.7% per year over the forecast period.

Jobs in each region

Each year we use ONS data to assess historic jobs per region against all levels of demand for both the service and manufacturing sectors.

Our analysis of this year's data showed that there was only one area where using this metric improved the forecast. This was commercial demand within Scotland LDZ and this is the only place where we have included historic job data within our econometric forecast.

Our forecasts for jobs per region are based on the OBR forecast, detailed in the November 2023 OBR Economic and Fiscal Outlook. This varies across LDZs, but for SGN overall there is slight growth forecast, averaging 0.9% per year across the forecast period.

Regional and specific variations

Behaviour change

All LDZs are forecast separately using both national and regional economic indices in our assessment. Any variations in regional economic indices can result in differences between LDZs.

We also establish the relationship between economic indices at an individual LDZ level, observing the differences, all LDZs show subtle variations to the same economic inputs.

Our forecast indicates behaviour change returning to 2021 comfort levels between 2025 and 2028. As per last year, the South East LDZ is forecast to return to these levels earliest, Scotland LDZ latest, with South LDZ in-between.

Domestic energy efficiency

We map historical rollout of energy efficiency measures per region using data from Department for Energy Security and Net Zero (DESNZ), distributing this within each LDZ using postcode data. This allows us to forecast variations in LDZs separately.

There are differences in energy efficiency schemes in Scotland compared to our Southern LDZs. All LDZs have ECO and GBI but SHDF is an England only scheme and specific to Scotland is Home Energy Scotland's Grant and Loan Scheme. These are all forecast separately creating variation across LDZs.

Some key points to note are:

- Housing in Scotland continues to benefit from higher insulation rates than the rest of the UK, partially due to ECO and partly due to the devolved government considering housing as an infrastructure asset. This has helped investment in proportionally more energy efficiency projects in Scotland than in England, especially with regards to those considered fuel-poor.
- Home Energy Scotland's Grant and Loan scheme adds further energy efficiency in Scotland's forecast.
- Scotland also has slightly higher boiler replacement rates. As with insulation, this is partly because the devolved government considers housing as an infrastructure asset.

New houses

Scotland has introduced the New Build Heat Standard which effectively stops new houses being heated by gas although we assume there will be a delay of a few years before we see any impact from the policy.

The Future Homes Standard is expected to introduce similar restrictions in England, but this is not yet legislated. For this reason, the policy is not included in our forecast and we continue to include new houses connecting to the gas network for the whole of the forecast period in England.

In the South East, there's been less additional gas demand from new houses as London tends to have smaller properties than the rest of the country including a higher proportion of flats. There's also a higher proportion of new properties being built without gas.

These factors are the reasons for the regional specific differences related to new houses between the LDZs in our forecasts.

Heat Pumps replacing gas boilers

There are different schemes for this element of the forecast in Scotland and our Southern LDZs. The Boiler Upgrade Scheme (BUS) applies to England with Home Energy Scotland's Grant and Loan Scheme applying to Scotland.

Changes in the Boiler Upgrade Scheme bring the incentive for both to £7,500 to replace a boiler with a heat pump however, the Scottish scheme also has the potential to borrow a further £7,500 for a heat pump.

We evaluate these separately and, as both schemes are still early in their inception, they will require monitoring with adjustments made as more data becomes available. However, our early analysis indicates a broadly similar performance of both.

Power generation

We see variations in how gas is used and developing to generate electricity across our networks in both location and size of new sites looking to connect, as well as patterns of use for existing sites already connected.

In Scotland, we've seen the largest growth in sites looking to connect to our networks. We assume this is due to the amount of growth and reliance on renewable generation in Scotland compared to southern England.

In our southern areas, regional constraints on the electricity networks are requiring existing generation capacity to operate more frequently. An example being capacity constraints associated with moving generated electricity from north to south of the Thames.

In short, there are regional differences, but the net result is a large proportion of demand increase within our forecast is supporting electricity system constraints.

Large loads

Daily Metered demand (DM) is dominated by one large site in South LDZ and two large sites in South East LDZ. In the South LDZ, the customer continues to work on its substantial expansion plans and in the South East LDZ one customer's pattern of demand continues to vary compared to the information we receive during our annual engagement meetings. This customer has also completed upgrades which have increased their peak demand and will potentially result in greater variances in patterns of demand as they become a more preferred generator due to site improvements.

Due to the large volumes and variations to the pattern of gas consumption, two of the southern customers heavily influence our forecasts creating challenges with both long and short range forecasting. In contrast, Scotland doesn't currently have customers of this magnitude influencing our networks in a similar way, as result demand for this sector is more consistent.

Service sector econometrics

Our forecast methodology continues to limit some of the growth in South East LDZ's services sector. We do this as our understanding is the growth, which the pure econometric analysis indicates, will be curtailed to some degree by the high population density and property costs in London. The result is employment and output remain constrained from the middle of the forecast for the South East LDZ although it remains a relatively small part of the demand in this area.

This curtailment reduces our forecast of service sector demand by 1.4% at the end for the forecast period for this LDZ. These dynamics have less impact in the Scotland and South LDZs and therefore we don't make similar allowances in these regions.

Forecast methodology

In 2021, Ofgem introduced Special Standard Licence Condition ("SSC") A57 (Exit Capacity Planning). This new licence condition includes a requirement for all licensees to report on their forecast methodology in full. As a result, to avoid duplication of information the methodology content of our LTDS has been replaced with a comprehensive understanding of our forecasting process, in-line with the requirements of SSC A57. Our methodology may now be found on our website **here**.

Demand forecasts

This next section provides an overview of our latest annual and peak gas demand forecasts through to 2033/34. These forecasts have been developed around the UNC load band categories and relate only to gas transported through our systems.

A more detailed overview can be found in Appendix A from page 38, which includes demand forecast tables for both annual and peak demand on a year-by-year and LDZ basis.

Annual demand

These figures show historical annual gas demand and the forecast going forward. The large reductions in 2022 and 2023, are mainly due to increases in fuel prices and increased cost-of-living impacting the domestic sector. Demand increases overall are dominated by one site in our South LDZ influencing the forecast.

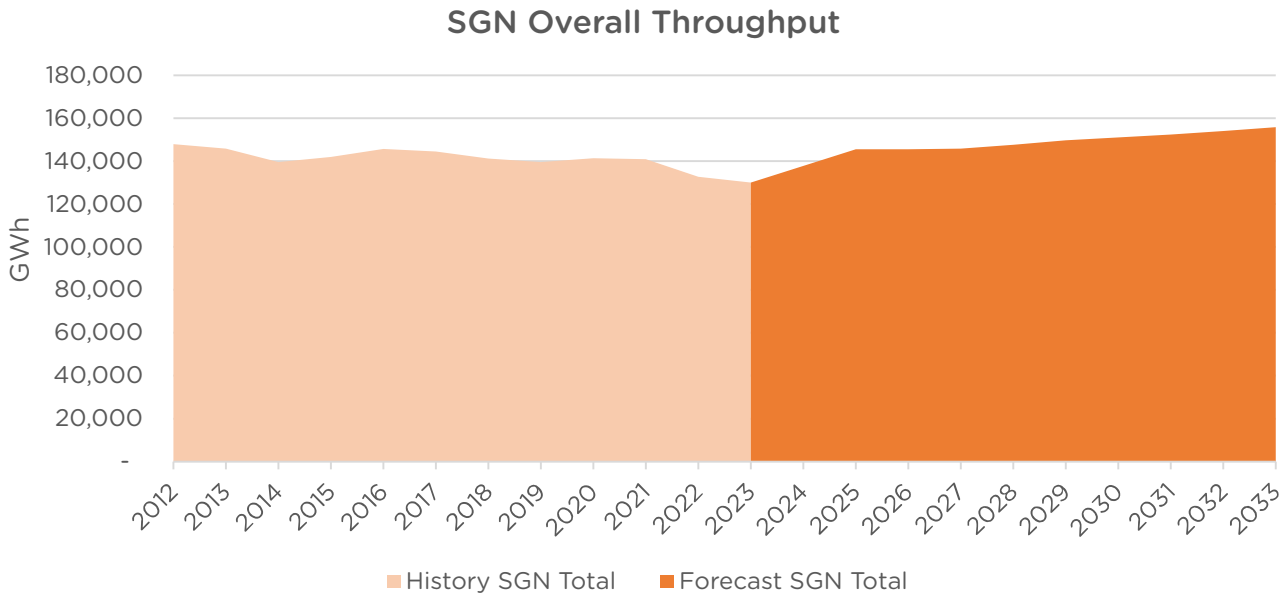


Figure 7: Historic and forecast annual demand - SGN overall

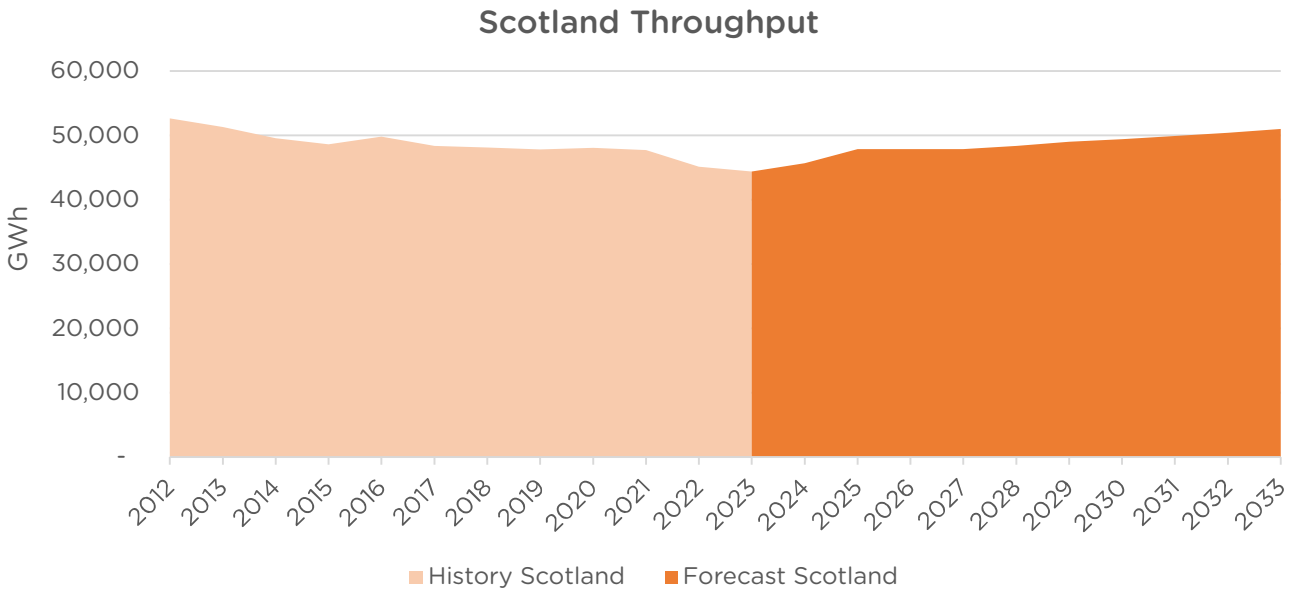


Figure 8: Historic and forecast annual demand - Scotland LDZ

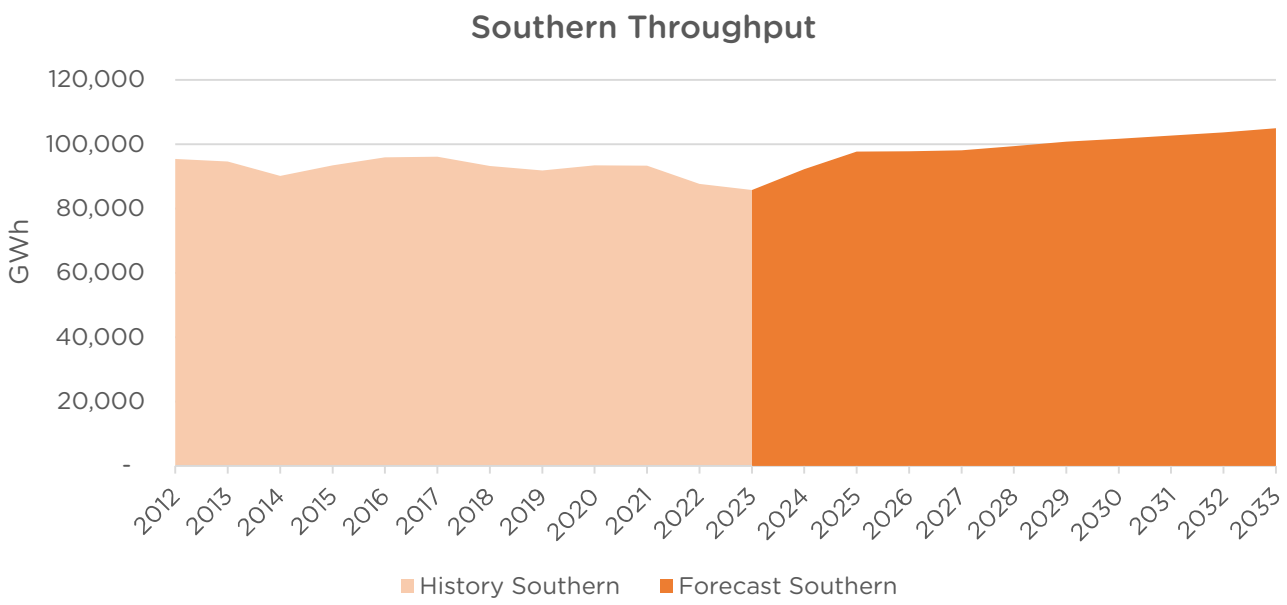


Figure 9: Historic and forecast annual demand - Southern LDZs

Average annual change in forecast Annual demand growth (2024–33)			
	SGN	Scotland	Southern
Annual demand growth	1.3%	1.2%	1.4%

Table 1: Change in forecast Annual demand growth (2024 - 33)

Peak demand

The following graphs show the equivalent view for peak demand. Peak demand is the key driver for planning investment.

While there was a dip in Peak demand during 2022 and 2023, this is far less pronounced than the corresponding dip in annual demand. This is due largely to the cold weather upturn where, despite high energy costs, domestic demand stays high during particularly cold weather due to comfort becoming a higher priority than cost.

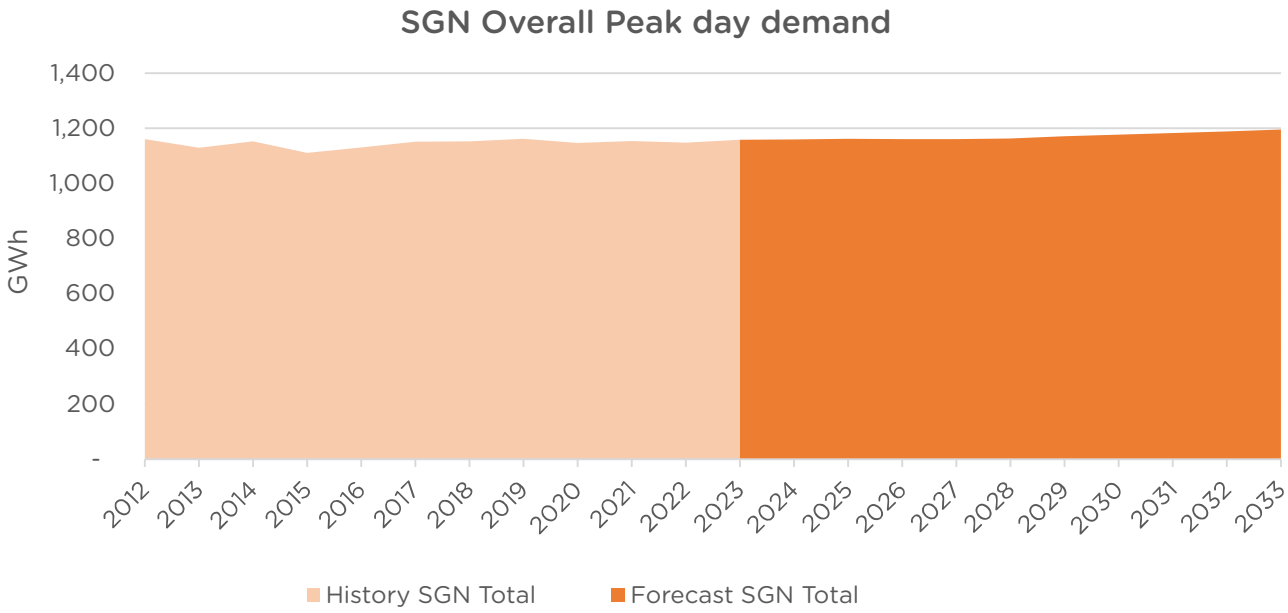


Figure 10: Historic and Peak demand - SGN overall

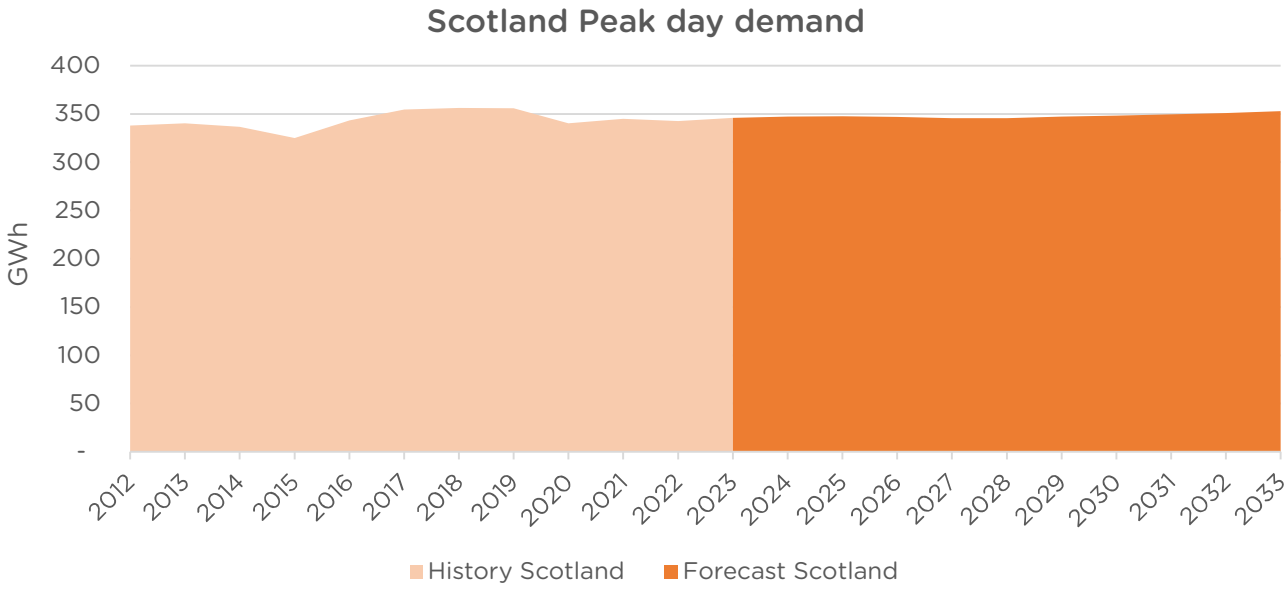


Figure 11: Historic and Peak demand - Scotland LDZ

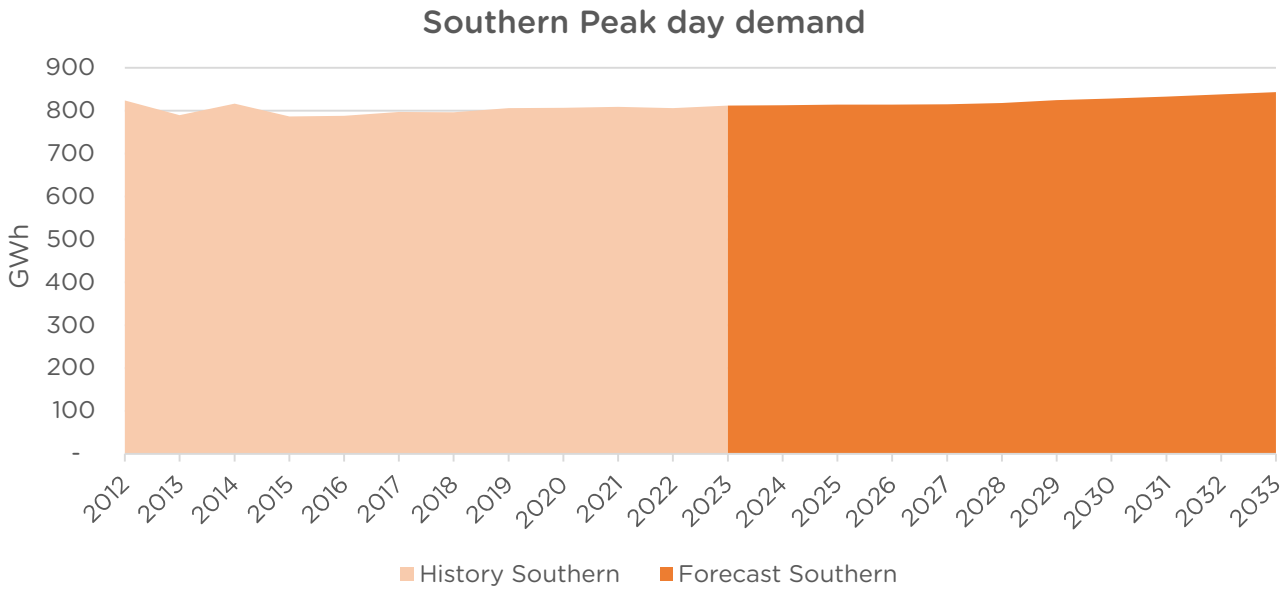


Figure 12: Historic and Peak demand - Southern LDZs

Average annual change in forecast Peak demand growth (2024-33)			
	SGN	Scotland	Southern
Peak demand growth	0.3%	0.2%	0.4%

Table 2: Change in forecast peak demand growth (2024-33)

Forecast comparisons

Scotland LDZ

The Scotland forecast indicates minimal change to peaks until the midpoint of the forecast. We have a slightly higher forecast for the non-domestic sector throughout, which is offset by a small reduction in new embedded generation, some sites included last year are no longer planning to connect.

From the midpoint of the forecast the prohibition of gas boilers in Scottish homes takes effect, leading to a small reduction in our peak forecast. This results in a peak that is 1.4% lower than the 2023 forecast, at the end of the forecast period.

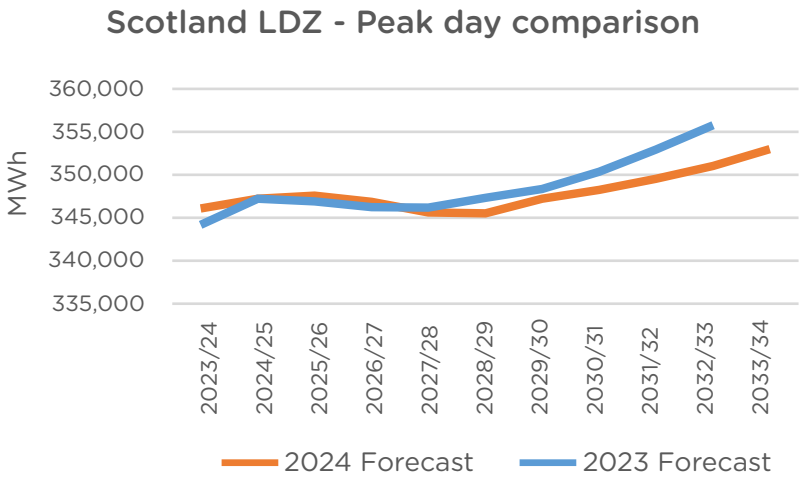


Figure 13: Scotland LDZ Peak Day Comparison

South East LDZ

In our South East LDZ, the forecast is slightly higher than last year throughout the forecast period. This is largely due to economic amendments to our forecast for the non-domestic sector. These changes were made to compensate for the under forecast in this sector experienced in 2023. We also saw the domestic sector being a little more price resilient than forecast in 2023, mainly because their reaction to the cost-of-living situation occurred earlier than in our other LDZs.

Domestic comfort levels increase further in this year's forecast and alongside lower levels of energy efficiency improvements, have an impact towards the end of the forecast period.

These factors combine to result in peak demand that is 3.4% higher at the end of the forecast period when compared to last year.

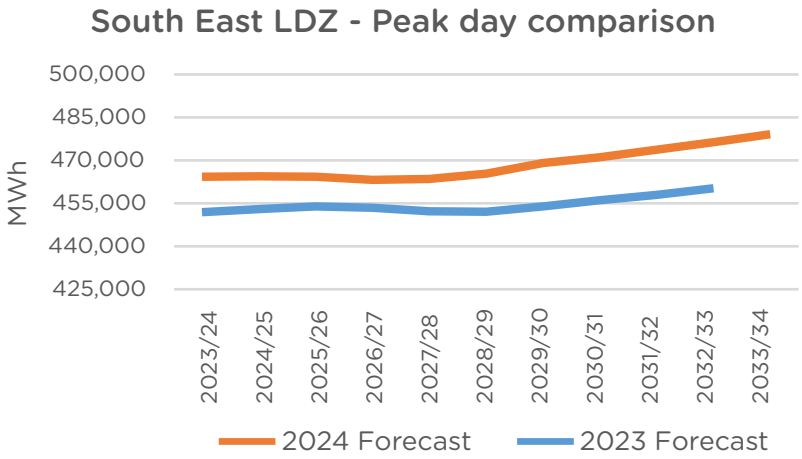


Figure 14: South East LDZ Peak day comparison

South LDZ

The outlook for our South LDZ is very similar to last year until the middle of the forecast when it begins to diverge from 2028/29 due to higher non-domestic demand as a result of stronger econometric forecasts.

In the domestic sector, lower levels of energy efficiency and an increase in comfort levels also contribute to this divergence.

At the end of the forecast period, the peak demand is 2.3% higher than forecast last year.

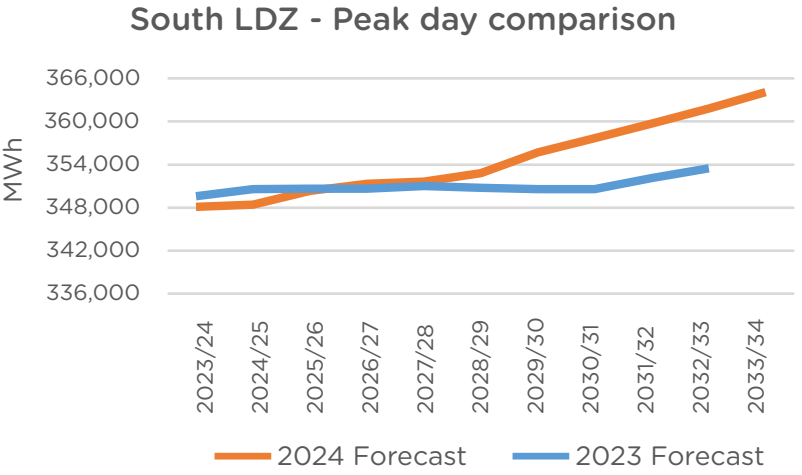


Figure 15: South LDZ Peak day comparison

Appendix A

Demand forecast tables

Forecast annual demand by load category - SGN overall (TWh)											
Calendar year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
NDM1 (0-73MWh)	78.0	82.1	89.2	89.1	89.1	90.6	92.2	93.1	94.1	95.1	96.3
NDM2 (73-732MWh)	12.4	12.5	12.7	12.9	12.9	13.0	13.1	13.2	13.3	13.4	13.5
NDM3 (732–2,196MWh)	5.6	5.5	5.4	5.4	5.4	5.4	5.4	5.4	5.5	5.5	5.5
NDM4 (2,196–5,860MWh)	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.5	3.5
Total small user	99.4	103.5	110.6	110.7	110.9	112.4	114.2	115.2	116.3	117.5	118.8
NDM5 (>5,860MWh)	7.3	7.2	7.0	7.0	7.1	7.1	7.1	7.1	7.1	7.2	7.2
DM	22.8	26.6	27.3	27.2	27.3	27.6	27.8	28.1	28.4	28.7	29.2
Total large user	30.1	33.7	34.3	34.3	34.4	34.7	34.9	35.2	35.6	35.9	36.4
Total (non Shrinkage)	129.5	137.3	144.9	145.0	145.3	147.0	149.1	150.4	151.9	153.4	155.2
Shrinkage	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Total	130.1	137.9	145.6	145.6	145.9	147.7	149.8	151.1	152.5	154.1	155.9

Gas supply year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Total throughput	135.9	143.6	145.6	145.8	147.3	149.3	150.8	152.2	153.7	155.4	157.2

Table 3: Forecast annual demand by load category - SGN overall

Forecast annual demand by load category – Scotland LDZ (TWh)											
Calendar year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
NDM1 (0-73MWh)	25.5	26.4	28.4	28.4	28.4	28.7	29.2	29.4	29.6	29.9	30.1
NDM2 (73-732MWh)	4.1	4.1	4.1	4.1	4.1	4.1	4.2	4.2	4.2	4.3	4.3
NDM3 (732–2,196MWh)	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2
NDM4 (2,196–5,860MWh)	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Total small user	33.4	34.2	36.2	36.2	36.2	36.6	37.0	37.3	37.5	37.8	38.2
NDM5 (>5,860MWh)	3.0	3.0	2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.0
DM	7.8	8.3	8.6	8.5	8.5	8.7	8.8	9.0	9.2	9.4	9.6
Total large user	10.8	11.3	11.5	11.5	11.5	11.6	11.8	12.0	12.1	12.4	12.6
Total (non Shrinkage)	44.2	45.5	47.7	47.6	47.7	48.2	48.8	49.2	49.7	50.2	50.8
Shrinkage	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total	44.4	45.7	47.8	47.8	47.8	48.4	49.0	49.4	49.9	50.4	51.0

Gas supply year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Total throughput	45.3	47.3	47.8	47.8	48.2	48.8	49.3	49.7	50.3	50.8	51.4

Table 4: Forecast annual demand by load category - Scotland LDZ

Forecast annual demand by load category – South East LDZ (TWh)											
Calendar year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
NDM1 (0-73MWh)	31.5	33.4	36.7	36.7	36.7	37.4	38.2	38.7	39.2	39.7	40.3
NDM2 (73-732MWh)	4.8	4.9	5.0	5.0	5.0	5.0	5.0	5.1	5.1	5.1	5.1
NDM3 (732–2,196MWh)	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9
NDM4 (2,196–5,860MWh)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2
Total small user	39.2	41.3	44.6	44.5	44.7	45.4	46.3	46.8	47.3	47.9	48.5
NDM5 (>5,860MWh)	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3
DM	8.4	8.6	8.7	8.7	8.7	8.8	8.8	8.8	8.8	8.9	8.9
Total large user	10.5	10.8	10.9	10.9	10.9	10.9	11.0	11.0	11.1	11.2	11.2
Total (non Shrinkage)	49.7	52.0	55.5	55.4	55.6	56.4	57.3	57.8	58.4	59.1	59.8
Shrinkage	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total	50.0	52.3	55.7	55.7	55.8	56.6	57.5	58.1	58.7	59.4	60.1

Gas supply year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Total throughput	51.7	54.9	55.7	55.8	56.4	57.3	58.0	58.6	59.2	59.9	60.6

Table 5: Forecast annual demand by load category - South East LDZ

Forecast annual demand by load category – South LDZ (TWh)											
Calendar year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
NDM1 (0-73MWh)	21.1	22.3	24.0	24.0	24.0	24.4	24.8	25.1	25.3	25.6	25.9
NDM2 (73-732MWh)	3.4	3.5	3.6	3.8	3.8	3.8	3.9	3.9	4.0	4.0	4.1
NDM3 (732–2,196MWh)	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
NDM4 (2,196–5,860MWh)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total small user	26.9	28.0	29.9	30.0	30.0	30.4	30.9	31.2	31.4	31.8	32.1
NDM5 (>5,860MWh)	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9
DM	6.6	9.7	10.0	10.0	10.1	10.2	10.2	10.3	10.4	10.5	10.7
Total large user	8.7	11.7	11.9	12.0	12.0	12.1	12.2	12.2	12.3	12.4	12.6
Total (non Shrinkage)	35.6	39.8	41.8	41.9	42.0	42.5	43.1	43.4	43.8	44.1	44.7
Shrinkage	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total	35.8	39.9	42.0	42.1	42.2	42.7	43.3	43.6	44.0	44.3	44.9

Gas supply year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Total throughput	38.9	41.5	42.1	42.2	42.6	43.1	43.5	43.9	44.2	44.7	45.1

Table 6: Forecast annual demand by load category - South LDZ

1 in 20 peak day firm demand forecast – at a glance (GWh)											
Calendar year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Scotland	346.1	347.2	347.5	346.8	345.6	345.5	347.2	348.2	349.5	351.0	353.0
South east	464.2	464.3	464.2	463.0	463.4	465.3	468.9	471.0	473.6	476.2	479.0
South	348.1	348.4	350.3	351.3	351.6	352.8	355.7	357.6	359.7	361.8	364.0
SGN overall	1,158.3	1,159.9	1,162.0	1,161.1	1,160.5	1,163.5	1,171.7	1,176.9	1,182.8	1,189.0	1,196.0

Table 7: 1 in 20 Peak day firm demand forecast - at a glance

1 in 20 peak day firm demand forecast – SGN overall by load categories (GWh)											
Calendar year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
NDM1 (0-73MWh)	829.1	826.3	823.6	821.3	819.0	820.0	826.0	828.7	831.9	835.2	838.9
NDM2 (73-732MWh)	105.4	107.0	108.5	110.0	110.6	111.2	112.0	112.8	113.6	114.5	115.5
NDM3 (732–2,196MWh)	35.2	34.5	33.8	33.8	34.0	34.1	34.1	34.3	34.4	34.6	34.7
NDM4 (2,196–5,860MWh)	22.0	21.6	21.2	21.2	21.3	21.4	21.4	21.5	21.6	21.7	21.8
NDM5 (>5,860MWh)	46.2	45.3	44.4	44.4	44.6	44.6	44.7	44.9	45.0	45.2	45.5
NDM total	1,037.9	1,034.7	1,031.5	1,030.7	1,029.5	1,031.3	1,038.3	1,042.2	1,046.5	1,051.2	1,056.5
DM	118.6	123.5	128.7	128.6	129.2	130.4	131.6	132.9	134.4	136.0	137.7
Total (non Shrinkage)	1,156.6	1,158.2	1,160.2	1,159.3	1,158.7	1,161.7	1,169.9	1,175.1	1,180.9	1,187.2	1,194.2
Shrinkage	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Total	1,158.3	1,159.9	1,162.0	1,161.1	1,160.5	1,163.5	1,171.7	1,176.9	1,182.8	1,189.0	1,196.0

Table 8: 1 in 20 peak day firm demand forecast - SGN overall by load categories

1 in 20 peak day firm demand forecast – Scotland LDZ by load categories (GWh)											
Calendar year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
NDM1 (0-73MWh)	235.9	235.3	234.4	233.6	232.1	231.3	232.1	232.1	232.3	232.5	233.0
NDM2 (73-732MWh)	32.0	32.2	32.1	32.1	32.2	32.3	32.4	32.6	32.8	33.1	33.5
NDM3 (732–2,196MWh)	12.6	12.3	12.1	12.2	12.3	12.3	12.3	12.3	12.4	12.4	12.5
NDM4 (2,196–5,860MWh)	8.8	8.6	8.4	8.5	8.6	8.6	8.6	8.6	8.6	8.7	8.7
NDM5 (>5,860MWh)	17.2	16.8	16.4	16.6	16.7	16.7	16.8	16.8	16.9	17.0	17.1
NDM total	306.5	305.3	303.4	303.0	301.8	301.1	302.2	302.5	303.1	303.7	304.8
DM	39.1	41.4	43.7	43.3	43.3	43.9	44.5	45.2	46.0	46.8	47.7
Total (non Shrinkage)	345.6	346.7	347.0	346.3	345.1	345.0	346.7	347.7	349.0	350.5	352.5
Shrinkage	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total	346.1	347.2	347.5	346.8	345.6	345.5	347.2	348.2	349.5	351.0	353.0

Table 9: 1 in 20 peak day firm demand forecast - Scotland LDZ by load categories

1 in 20 peak day firm demand forecast – South East LDZ by load categories (GWh)											
Calendar year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
NDM1 (0-73MWh)	344.9	342.6	341.4	340.1	339.7	341.0	344.0	345.5	347.3	349.1	350.9
NDM2 (73-732MWh)	42.8	44.0	44.2	44.4	44.7	44.8	45.0	45.2	45.4	45.6	45.9
NDM3 (732–2,196MWh)	11.6	11.5	11.5	11.4	11.6	11.7	11.8	11.9	12.1	12.2	12.4
NDM4 (2,196–5,860MWh)	7.1	7.1	7.1	7.0	7.1	7.2	7.3	7.3	7.4	7.5	7.6
NDM5 (>5,860MWh)	13.8	13.7	13.7	13.6	13.8	13.9	14.1	14.2	14.4	14.5	14.7
NDM total	420.2	419.0	417.7	416.6	416.8	418.6	422.1	424.1	426.5	428.9	431.4
DM	43.2	44.7	45.6	45.7	45.8	45.9	46.0	46.1	46.3	46.5	46.7
Total (non Shrinkage)	463.4	463.6	463.4	462.3	462.6	464.5	468.1	470.3	472.8	475.4	478.2
Shrinkage	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total	464.2	464.3	464.2	463.0	463.4	465.3	468.9	471.0	473.6	476.2	479.0

Table 10: 1 in 20 peak day firm demand forecast - South East LDZ by load categories

1 in 20 peak day firm demand forecast – South LDZ by load categories (GWh)											
Calendar year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
NDM1 (0-73MWh)	248.4	248.4	247.8	247.5	247.2	247.7	249.9	251.1	252.3	253.7	255.0
NDM2 (73-732MWh)	30.6	30.9	32.3	33.5	33.8	34.2	34.6	35.1	35.4	35.8	36.1
NDM3 (732–2,196MWh)	11.0	10.6	10.3	10.2	10.2	10.1	10.0	10.0	9.9	9.9	9.9
NDM4 (2,196–5,860MWh)	6.1	5.9	5.7	5.7	5.7	5.6	5.6	5.6	5.5	5.5	5.5
NDM5 (>5,860MWh)	15.2	14.7	14.2	14.2	14.1	14.0	13.9	13.8	13.8	13.7	13.7
NDM total	311.3	310.5	310.3	311.1	310.9	311.6	314.0	315.5	317.0	318.6	320.2
DM	36.3	37.3	39.4	39.6	40.2	40.6	41.1	41.6	42.1	42.7	43.3
Total (non Shrinkage)	347.6	347.8	349.7	350.7	351.0	352.2	355.1	357.1	359.1	361.3	363.5
Shrinkage	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total	348.1	348.4	350.3	351.3	351.6	352.8	355.7	357.6	359.7	361.8	364.0

Table 11: 1 in 20 peak day firm demand forecast - South LDZ by load categories

Appendix B

2023 flows and supporting information

This appendix describes annual flows during the 2023 calendar year.

Annual flows

Forecasts of annual gas demand are based on average weather conditions. Therefore, when comparing actual demand with forecasts, demand must be adjusted to take account of the difference between actual weather conditions and seasonal normal weather. The result of this adjustment is the weather corrected demand. Recent winters have included some of the warmest of any in the weather data history employed for demand modelling, dating back to 1960/61. Consequently, the basis of the average weather condition used for demand forecasting purposes has been adjusted to better reflect these conditions.

Anecdotal evidence to the contrary is based on specific days or weeks and not the entire winter period. As a result, the 2023 weather corrected annual demands and forecasts are based on the industry's current view and research in cooperation with the Hadley Centre, which is part of the Met Office. Tables 12 to 14 provide a comparison of actual and weather-corrected demands during the 2023 calendar year with the forecasts presented in our 2023 LTDS. Annual demands are presented in the format of LDZ load bands/categories, consistent with the basis of system design and operation.

Note: Figures may not sum exactly due to rounding and changes in the way Xoserve report UIG.

Annual demand for 2023 - Scotland LDZ (TWh)			
	Actual demand	Weather corrected demand	2023 LTDS forecast demand
0 - 73.2MWh	24.2	25.3	25.7
73 – 5,860MWh	7.5	7.9	7.7
>5,860MWh firm	10.5	10.8	11.8
Total LDZs	42.4	44.2	45.2
Shrinkage	0.2	0.2	0.2
Total throughput	42.6	44.4	45.4

Table 12: Annual demand for 2023 – Scotland LDZ

Annual demand for 2023 - South East LDZ (TWh)			
	Actual demand	Weather corrected demand	2023 LTDS forecast demand
0 - 73.2MWh	30.9	32.1	31.7
73 – 5,860MWh	7.6	7.9	7.4
>5,860MWh firm	10.4	10.5	10.0
Total LDZs	48.0	49.7	49.1
Shrinkage	0.2	0.2	0.3
Total throughput	48.3	49.9	49.4

Table 13: Annual demand for 2023 – South East LDZ

Annual demand for 2023 - South LDZ (TWh)			
	Actual demand	Weather corrected demand	2023 LTDS forecast demand
0 - 73.2MWh	20.0	21.2	21.1
73 – 5,860MWh	5.5	5.9	5.9
>5,860MWh firm	8.6	8.8	10.4
Total LDZs	33.9	35.9	37.3
Shrinkage	0.2	0.2	0.2
Total throughput	34.1	35.9	37.5

Table 14: Annual demand for 2023 – South LDZ

Winter severity statistics

Sourced from the April 2024 National Grid Winter Severity Report 2023/24, these statistics cover the gas industry interpretation of winter lasting for a 6 month period from October to March inclusive.

By way of explanation a winter can be either warm, cold or average. The 1 in 'X' is a measure of how far away from average it is and if it is either cold or warm.

1 in 'X' winter severities per LDZ	
LDZ	1 in 'X'
Scotland	3_warm
South East	3_warm
South	3_warm
National	3_warm

Table 15: 1 in X winter severities per LDZ

Maximum and minimum flows

Table 16 indicates the highest and lowest daily demands for each LDZ seen between October 2023 and September 2024 and when they occurred.

Table 17 shows % flow of forecast peak day for each LDZ on the maximum and minimum demand day of gas year 2023-24.

Actual flows on the maximum and minimum demand day of gas year 2023/24 (mscmd)		
LDZ	Maximum day 2023/24	Minimum day 2023/24
Scotland	22.91 mscm/d (18/01/2024)	4.24 mscm/d (20/07/2024)
South East	30.09 mscm/d (18/01/2024)	4.16 mscm/d (28/07/2024)
South	20.56 mscm/d (18/01/2024)	3.22 mscm/d (20/07/2024)

Table 16: Actual flows on the maximum and minimum demand day of gas year 2023/24

Maximum and minimum demands of gas year 2023/24 (as a percentage)			
LDZ	Forecast peak day	Actual maximum peak day	Actual minimum peak day
Scotland	31.69 mscm/d	72.27%	13.25%
South East	41.49 mscm/d	72.53%	10.20%
South	32.69 mscm/d	63.27%	8.92%

Table 17: Maximum and minimum flows of gas year 2023/24

Biomethane sites

Table 18 shows the total number of biomethane sites connected to our networks with contracted capacity and the equivalent number of domestic customers this gas might be able to supply based on the Ofgem average AQ of 11,500 KWh.

The total number of equivalent domestic customers supplied includes the total capacity provided at our largest facility in our Scotland network located at Girvan which has sufficient connected capacity to supply 41,790 domestic customers annual energy requirement.

There are currently 13 projects at various stages of development which are due to connect between now and 2026.

Portfolio of Biomethane sites as of end August 2024		
LDZ	Total	Equivalent no of domestic customers
Scotland	24	191,356
Southern	18	125,470
Total	42	316,826

Table 18: Portfolio of Biomethane sites as of end August 2024

<7bar distribution projects

We undertake yearly reviews of our networks, ensuring sufficient capacity is in place before each Winter period. Accurately tracking new connections and already-connected sites as they develop provides strong evidence for making decisions regarding any reinforcement projects. We liaise with new and existing customers, significant gas users and with local authorities to ensure we have an accurate picture of how gas demand will or could evolve on our networks.

Utilising innovative insertion and drilling techniques to replace the iron mains with modern plastic pipes also reduces the impact on the local environment, completing the works quickly and efficiently, with minimal disruption to customers and the local communities whilst future proofing our networks for low and zero carbon energy solutions.

By analysing the material makeup of each of our individual networks, we have targeted invested in enhanced pressure control equipment, allowing us to reduce system pressures where possible thereby reducing our carbon footprint as a result of shrinkage.

Alternatives to reinforcement

All projects are regularly reviewed to ensure any alternatives are explored and ultimately that reinforcement options are fully justified and not excessive, protecting our customers from funding unnecessary investment.

In evaluating each of the planned projects below, we thoroughly examined the option of interruption as a potential alternative to reinforcement. However, the degree of interruption required to eliminate the need for reinforcement is either impractical or insufficient to negate the need for reinforcement. We also explored an alternative which involved increasing operating pressures in the affected areas, however in these cases, elevating pressures would not have eliminated the requirement for reinforcement.

Tables 19 to 25 provide a comprehensive overview of major projects with a pressure level of less than 7bar that align with the planning horizon discussed in this year's LTDS. Major projects are works estimated to cost up to and in excess of £500,000. As a result of how we manage these projects explained above there may be adjustments to the projects shown compared to the previous year's LTDS.

Projects under construction

<7 Bar major projects under construction in Scotland LDZ		
Project	Build year	Project scope
Haddington – Dunbar IP	2024/25	180mm PE IP x 115m + 315mm PE MP x 120m & new DPG
Sighthill, Glasgow	2024/25	355mm LP PE x 510m

Table 19: <7 bar major projects under construction in Scotland LDZ

<7 Bar major projects under construction in South LDZ		
Project	Build year	Project scope
Burndell Road, Yapton, Arundel	2024/25	4.1km x 355mm MP PE
Grenoble Road, Oxford, Oxfordshire	2024/25	2.2km x 180mm IP PE and governor install

Table 20: <7 bar major projects under construction in South LDZ

<7 Bar major projects under construction in South East LDZ		
Project	Build year	Project scope
None		

Table 21: <7 bar major projects under construction in South East LDZ

Projects under consideration

<7 Bar major projects under consideration in Scotland LDZ		
Project	Build year	Project scope
Great Western Road, Glasgow	2025/26	Uprating of 4.5km of MP mains & installation of 3x DPG & 400m of inlet/outlet mains
Tranent IP – Phase 2	2026/27	2.4km x 315 HDPE IP
Aberlady - Gullane (Phase 1)	2026/27	446m x 315mm PE MP

Table 22: <7 bar major projects under consideration in Scotland LDZ

<7 Bar major projects under consideration in South LDZ		
Project	Build year	Project scope
Hithercroft Road, Wallingford	2025/26	1.6km x 250mm MP PE

Table 23: <7 bar major projects under consideration in South LDZ

<7 Bar major projects under consideration in South East LDZ		
Project	Build year	Project scope
Cockering Road, Canterbury	2025/26	1km x 180mm PE MP

Table 24: <7 bar major projects under consideration in South East LDZ

Projects with low probability of progressing

<7 Bar major projects with low probability (all LDZs)		
Project	Build year	Project scope
None		

Table 25: <7bar low probability projects

Appendix C

Links and contacts

Internal contacts

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customer@sgn.co.uk
Our 24-hour Customer Service team can be reached by email or by calling 0800 912 1700. You can also find us on Facebook or follow us on Twitter at @SGNgas.

LinesearchbeforeUdig (lsbud.co.uk)
Safety is our number one priority, before you dig always request details of our pipework's location via this online service.

lets.chat@sgn.co.uk
We are always interested in engaging with our stakeholders This is how we look to improve the way we do things by listening to your feedback.

sgn.co.uk
You can apply for a new gas connection online through our website and learn more about our Help to Heat scheme. You can also find further information about our planned and emergency works in your area.

External contacts

ofgem.gov.uk
Office of Gas and Electricity Markets. Regulating authority for gas industry and markets.

ENA
Energy Networks Association represents the 'wires and pipes' transmission and distribution network operators for gas and electricity in the UK

Xoserve
One of several service providers supporting the UK Gas Industry.

Joint Office of Gas Transporters
The Joint Office is where the UNC can be found. There are also details of live modifications to the document and the various working bodies relating to the gas industry.

DESNZ - Department for Energy Security & Net Zero
DESNZ brings together responsibilities for business, industrial strategy, science, innovation, energy, and climate change.

Glossary

Annual Quantity (AQ) - The AQ of a supply point is its annual consumption over a 365 or 366-day year, under conditions of average weather.

Bar - The unit of pressure that is approximately equal to atmospheric pressure (0.987 standard atmospheres). Where bar is suffixed with the letter g, such as in barg or mbarg, the pressure being referred to is gauge pressure, i.e. relative to atmospheric pressure. One-millibar (mbar) equals 0.001 bar.

DESNZ – Department for Energy Security and Net Zero - DESNZ took over former responsibilities of BEIS Department for Business, Energy & Industrial Strategy in February 2023

Biomethane - Biogas that has been cleaned in order to meet GSMR requirements.

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.

Climate Change Levy (CCL) - Government tax on the use of energy within industry, commerce and the public sector in order to encourage energy efficient schemes and use of renewable energy sources. CCL is part of the UK Government's Climate Change Programme (CCP).

Comfort levels - a term used in demand assessment referring to the temperatures at which households choose to heat their homes.

Connected System Exit Point (CSEP) - A connection to a more complex facility than a single supply point. For example, a connection to a pipeline system operated by another gas transporter.

Cubic metre (m3) - The unit of volume, expressed under standard conditions of temperature and pressure, approximately equal to 35.37 cubic feet. One million cubic metres (mcm) are equal to 106 cubic metres, one billion cubic metres (bcm) equals 109 cubic metres.

Daily metered supply point - A supply point fitted with equipment, for example a data-logger, which enables meter readings to be taken on a daily basis. These are further classified as SDMC, DMA, DMC or VLDMC according to annual consumption. Of these the most relevant is VLDMC which is defined further on.

Distribution system - A network of mains operating at three pressure tiers: intermediate (7 to 2barg), medium (2barg to 75mbarg) and low (less than 75mbarg).

Diurnal storage - Gas stored for the purpose of meeting 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.

Embedded entry points - Entry point which is not an offtake from NTS. Can be a biomethane or other unconventional source of gas.

Embedded power stations – Gas fired power stations designed to provide resilience within a local electricity power grid by generating electricity according to operational and market factors.

Exit zone - A geographical area within an LDZ, which consists of a group of supply points, which on a peak day, receive gas from the same NTS Offtake.

FEED - Front End Engineering Design is an engineering design approach adopted prior to detailed engineering, procurement, and construction. (See also Pre Feed)

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

Future Energy Scenarios (FES) - The National Energy System Operator's (NESO) annual industry-wide consultation process encompassing the 10 Year Statement, targeted questionnaires, individual company and industry meetings, feedback on responses and investment scenarios. Previously called Transporting Britain's Energy.

Gas day – Used by gas industry for buying and selling gas on open market. Defined as running from 05:00 on one day to 05:00 on the following day.

Gas Distribution Network (GDN) - An administrative unit responsible for the operation and maintenance of the local transmission system (LTS) and <7barg distribution networks within a defined geographical boundary, supported by a national emergency services organisation.

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

Gasholder - A vessel used to store gas for the purposes of providing diurnal storage.

Gas supply year - A 12-month period commencing 1 October also referred to as a gas year.

Gemini - A computer system which supports Uniform Network Code operations, including energy balancing.

GVA - Gross Value Added (GVA) measures the contribution to the economy of each individual producer, industry, or sector in the United Kingdom

H100 100% hydrogen project – Our Hydrogen 100 project in Fife, Scotland is designed to demonstrate the safe, secure and reliable distribution of hydrogen to reduce carbon output and progress towards the 2050 UK carbon target. More information is available at www.sgn.co.uk/Hydrogen-100

Interconnector - This is a pipeline transporting gas from or to another country.

Interruptible supply point - A supply point that offers lower transportation charges where SGN can interrupt the flow of gas to the supply point and that is prepared to be interrupted if the Transporter needs it to.

Kilowatt hour (kWh) - A unit of energy used by the gas industry. Approximately equal to 0.0341 therms

LDUG – LDz **U**naccounted for **G**as

Linepack - The usable volume of compressed gas within the national or local transmission system at any time.

Liquefied Natural Gas (LNG) - Gas stored in liquid form. Can be firm or constrained (CLNG). Shippers who book a constrained service agree to allow us to use some of their gas to balance the system.

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 NTS offtakes. Consists of high pressure (>7 barg) and lower pressure distribution system pipelines.

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

National balancing point (NBP) - An imaginary point on the UK gas supply system through which all gas passes for accounting and balancing purposes.

National Transmission System (NTS) - A high-pressure system consisting of terminals, compressor stations, pipeline systems and offtakes. Designed to operate at pressures up to 85barg. NTS pipelines transport gas from terminals to NTS offtakes.

National Transmission System Offtake - An installation defining the boundary between NTS and LTS or a very large consumer. The offtake installation includes equipment for metering, pressure regulation, etc.

Network Entry Agreement (NEA) - The Network Entry Agreement sets out the technical and operational conditions for any third party site injecting gas into our networks.

Network entry facility - Sites with the necessary equipment and agreements in place which enable the injection of gas into our networks by a third party.

Non-daily metered (NDM) - A meter that is read monthly or at longer intervals. For the purposes of daily balancing, the consumption is apportioned using an agreed formula, and for supply points consuming more than 73.2MWh pa reconciled individually when the meter is read.

Odorisation - The process by which the distinctive odour is added to gas supplies to make it easier to detect leaks. Odorisation is provided at all Network Entry points.

Office of Gas and Electricity Markets (Ofgem) - The regulatory agency responsible for regulating the UK's gas and electricity markets.

Offtake - An installation defining the boundary between NTS and LTS or a very large consumer. The offtake installation includes equipment for metering, pressure regulation, etc.

ONS - Office for National Statistics.

Operating Margins - Gas used to maintain system pressures under certain circumstances, including periods immediately after a supply loss or demand forecast change, before other measures become effective and in the event of plant failure, such as pipe breaks and compressor trips.

OPN - Offtake Profile Notice. Method of notifying National Grid of the next day or future demand for gas at offtakes.

Planning and Advanced Reservation of Capacity Agreement (PARCA) - A bilateral contract between National Grid and their customer which allows entry and/or exit capacity to be reserved in advance of the completion of a connection.

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.

Pre Feed - Preliminary FEED (front end engineering and design) document that is a predefined design package to prove the feasibility in technical and economics. The Pre-FEED is used to a basis of FEED deliverables or basic engineering. See also FEED.

Price Control Review – RIIO - Ofgem's periodic review of Transporter allowed returns. The current period is called RIIO-GD2 and commenced in April 2021 and lasts five years to March 2026.

RIIO stands for:

Revenue = Incentives + Innovation + Outputs.

PRI - Pressure Regulating Installation - The replacement term for PRS, district governor and all other local terms (such as STRS or TRS) when IGEM standard TD13 was introduced.

PRS - Pressure Regulating Station - An installation which reduces the supply pressure as gas passes either between different pressure rated tiers of the LTS or from the LTS to the below 7barg network or between different pressure tiers of the <7barg network.

Real Time Networks - Our Real-Time Networks project aims to make gas supply's more secure and affordable by demonstrating how a flexible gas network could be more efficient for our evolving energy market and meet changing customer demands. To do this we are capturing representative data of customer gas demand recording how much gas is needed and when from 1,200 gas meters in the south-east.

Seasonal Normal Temperature (SNT) - Seasonal Normal Temperature is the average temperature that might be expected on any particular day, based on historical data.

Shipper or network code registered user (system user) - A company with a shipper licence that is able to buy gas from a producer, sell it to a supplier and employ a GT to transport gas to consumers.

Shrinkage - Gas that is input to the system but is not delivered to consumers or injected into storage. It is either 'own use gas' or 'unaccounted for gas'.

Supplier - A company with a supplier's licence contracts with a shipper to buy gas, which is then sold to customers. A supplier may also be licensed as a shipper.

Supply Hourly Quantity (SHQ) - The maximum hourly consumption at a supply point.

Supply Offtake Quantity (SOQ) - The maximum daily consumption at a supply point.

Supply point - A group of one or more meters at a site.

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

Unidentified Gas (UIG) - The gas that is off taken from the Local Distribution Zone (LDZ) system, but not attributed to an individual Supply Meter Point or accounted for as Shrinkage, is referred to as UIG.

Uniform Network Code (UNC) - The Uniform Network Code covers the arrangements between National Grid, shippers and the DNs following the selling off of four of the networks.

UKCS - United Kingdom Continental Shelf.

UK-Link - A suite of computer systems that supports Uniform Network Code operations. Includes supply point administration, invoicing, and the sites and meters database.

VLDMC - Very Large Daily Metered Customer. A site which uses greater than 50,000,000 therms a year.

Disclaimer

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These are Standard Condition 25 and Standard Special Condition D3 of their respective Gas Transporter Licences and Section O 4.1 of the Transportation Principal Document in the Uniform Network Code in accordance with information supplied pursuant to Section O of the Transportation Principal Document in the Uniform Network Code. Section O 1.3 of the Transportation Principal Document in the Uniform Network Code applies to any estimate, forecast or other information contained in this document.

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If you smell gas or are worried about gas safety you can call the National Gas Emergency Number on:
0800 111 999

Carbon monoxide (CO) can kill. For more information visit:
sgn.co.uk/help-and-advice/keeping-gas-safe/carbon-monoxide

Before you dig contact:
lsbud.co.uk

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Your gas. Our network.

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