SGN

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Long Term Development Statement 2022

Contents

Foreword

Welcome to our Long Term Development Statement for 2022. Our opportunity to present the results of our annual forecasting process to our 5.9m customers and wider stakeholders.

This last year we have experienced the hottest temperatures we've ever seen with record breaking highs of over 40° C in some areas of the UK.

The extreme temperatures resulted in higher levels of electricity demand than forecast and created some challenging times for the UK energy system at a time when our electricity interconnectors were supporting our continental partners as they were also finding it challenging to balance supply and demand due to the heat.

The higher demands have been attributed to an increased use of fans and air conditioning units and the challenges partly brought about because of a shortfall in renewable generation and other forms of generation unable to fully support the increased demand as they were unable to run at full capacity in the extreme temperatures.

The result of this has been an increased awareness of where our energy comes from and the limitations of a supply, which to a large extent we have come to take for granted.

These recent events have highlighed just how integrated our energy system is and how much we need to work with all our partners on behalf of our 5.9m customers, not only for today but for the future.

I hope you find this publication both useful and informative. If you have any questions or feedback on our LTDS or any aspect of our forecasting process please contact one of our industry experts listed in appendix C.

Paul Denniff
Network and Safety Director

LTDS annual cycle

February
We provide pre-forecast information to National Grid Gas UK Transmission (NGG UKT)

February / March
We meet with NGG UKT to discuss pre-forecast data

April
We provide our initial forecasts to NGG UKT

June
We meet NGG UKT to discuss our final forecasts

July
NGG UKT provides calorific value (CV) forecast

October
We publish our LTDS

The research we carry out to inform our LTDS is completed by the end of May each year

Our Long Term Development Statement (LTDS) is the product of a yearly cycle of data gathering, analysis and consultations with our stakeholders all of which allows us to understand how our business may develop over the next 10 years and beyond.

We use the LTDS to inform our operational strategy as well as our investment and business decisions. It also allows our customers to identify and evaluate opportunities for entry and exit gas connections.

Each year we update our demand forecasts with learning from the previous year. This ensures we're in the best position to deliver a reliable gas supply for our customers whatever challenges the future may hold.

Our Long Term Development Statement (LTDS) is produced by our Network Capacity team with input from across our business.

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.

Reviewing our forecasts

We continue to review our forecasts annually to ensure they benefit from the most up-to-date information available, utilising a bottom-up assessment of the factors which impact gas demand wherever possible.

This enables us to better understand why and how demand for gas is changing and the impact these changes have on the detailed elements of our forecast each year.

This approach helped us in our assessment of the impacts of the COVID-19 pandemic. Now, as the worst of the pandemic is hopefully over, it allows us to remove those specific assumptions in favour of government informed analysis. As a result, any longer-term impacts of the pandemic are in line with the Office of Budget Responsibilities (OBR) projections, mainly within our long term economic projections.

Over the last year we have also introduced further effort in understanding demand requirements at an increasing number of individual sites.

In the past we would have concentrated this work on what are considered large loads only, but we have widened the scope to include those customers whose level and pattern of demand has the potential to disrupt the accuracy of our forecasts. You can read more on this later.

In the region of three quarters of our analysis is based on the bottom-up approach. However, we continue to work on ways to better understand our customers' gas demand so we may deliver improvements in our modelling and produce the most accurate forecast of peak and annual demand possible.

Increased cost of living and energy

The rising cost of living features strongly in our forecast this year, with unprecedented energy price increases and inflationary pressures on factors including transport and food costs impacting all sectors, especially UK households' ability to pay for energy.

This has had a marked impact on domestic demand for the first few years of our forecast resulting in a dip in gas demand during this period, but we are presently predicting demand will recover over the ten years of the forecast out to 2031.

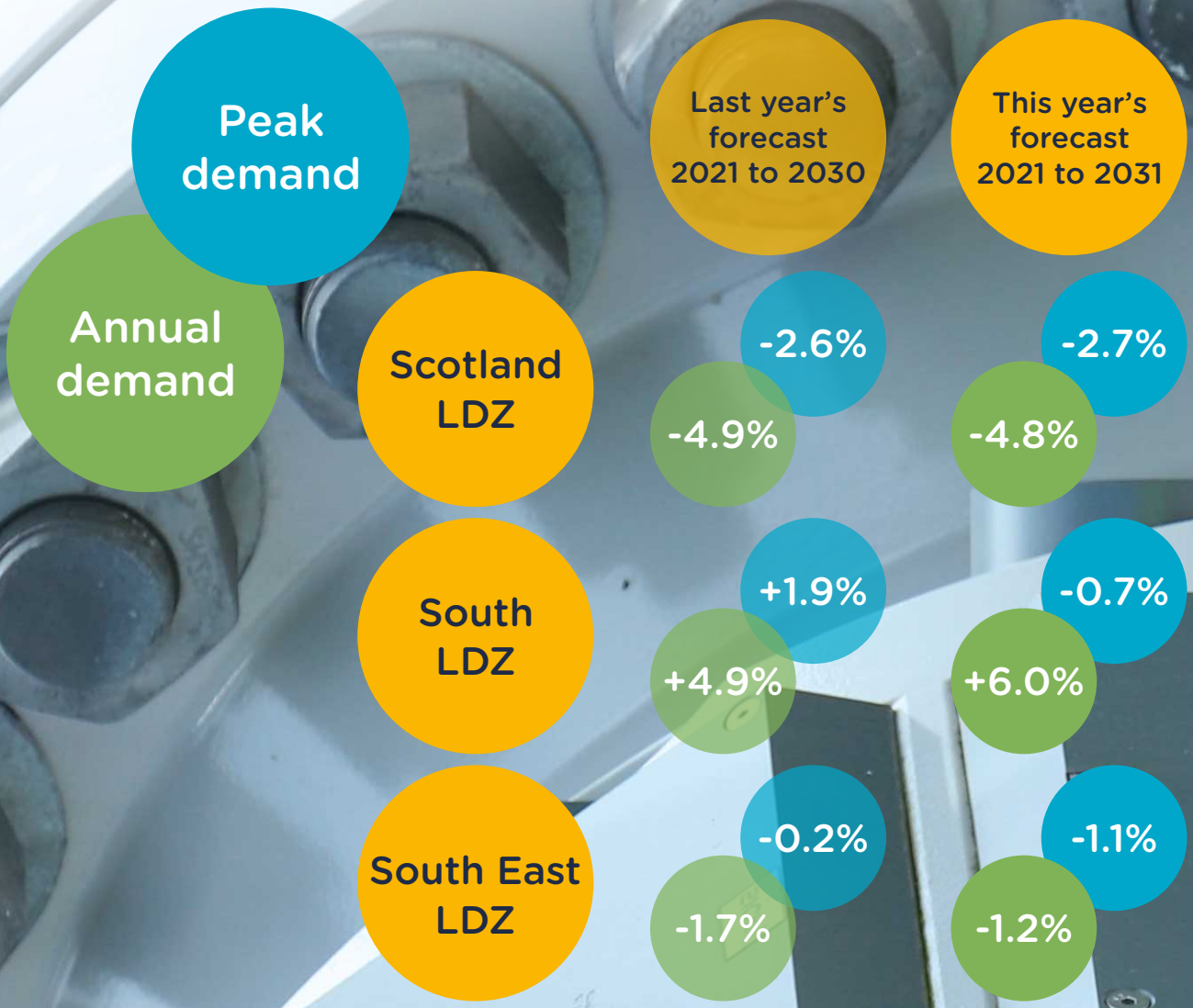
The rising cost of living has a high impact on the forecast this year, impacting all demand sectors but mainly domestic.

The next ten years

Our forecast covers a ten year planning horizon and is the result of a detailed assessment of current government legislation, historic and projected economic trends as well as current, past and forecasted customer behaviour.

The outputs from our analysis enables us to plan and manage our networks to ensure a safe and efficient supply of energy on behalf of our 5.9 million customers.

How demand is forecast to change since last year...



We plan our networks on our peak demand forecasts as this allows us to ensure we can satisfy our customers' gas requirements when they need it most...

The main factors which influenced our 2022 forecasts are...

The impacts of increased fuel prices and cost of living on all sectors, particularly domestic demand

Growth in embedded power stations connected to our networks which are increasingly being used as backup for when renewable energy sources are unavailable

Expansion of the largest customer in our South LDZ increasing total annual and peak demand for that LDZ

Existing low levels of insulation retrofitted to existing homes is forecast to continue based on current activity

The continuation of legislated boiler rollout to more efficient condensing boilers reducing domestic gas demand

The following sensitivities are not yet developed enough to be included within our forecasts. These include proposed legislation by both central and regional governments and technological developments designed to enable net zero.

Potential impacts of ECO4 intended to increase energy efficiency. This remained out for consultation at the time of the forecast. Impacts will be included next year although they are currently forecast to be low

Central government proposals to ban fossil fuel boilers in new homes from 2025 and the impact this may have on gas demand

Central government proposals to end the sale of new ICE cars and HGVs by 2030 and 2040 and the resulting impact this may have on electricity generation

Potential 600,000 heat pump installations each year by 2028, although an allowance for the BUS (Boiler Upgrade Scheme) is included

Customer Engagement in 2022

Over the last year we have looked to improve how we manage demand for those customers who have the potential to adversely impact our forecasts. This has been made a lot easier recently than in the past mainly because of the wider use of online meeting facilities and how they allow a more productive conversation to take place than a call, email or mailshot. To date, we have met virtually with 30 customers.

Some customers are already reacting to the need to decarbonise and their plans could well develop within the ten year planning horizon of our forecasts resulting in our forecasts proving inaccurate so this work is vital to ensure we are making the correct decisions.

We include smaller users within this initiative as the aggregate demand of a high number of individual customers has the potential for a significant impact, especially in areas where our systems are nearing or have reached maximum capacity. This work could also result in a release of capacity for the benefit of new or existing customers. Due to the granular approach to our forecasting, we are able to incorporate the results of these conversations into the forecasting analysis and planning processes in a way which isn't possible with a top down approach.

If you would like to discuss your plans to decarbonise and how it impacts your gas demand please get in touch with our LTS Future Systems Planning Manager using the contact details in appendix C.

As a direct result of this improved engagement we have been able to refer a number of customers on to our Energy Futures team so they may discuss their options for decarbonising and the part they may play in our plans to deliver hydrogen via our networks.

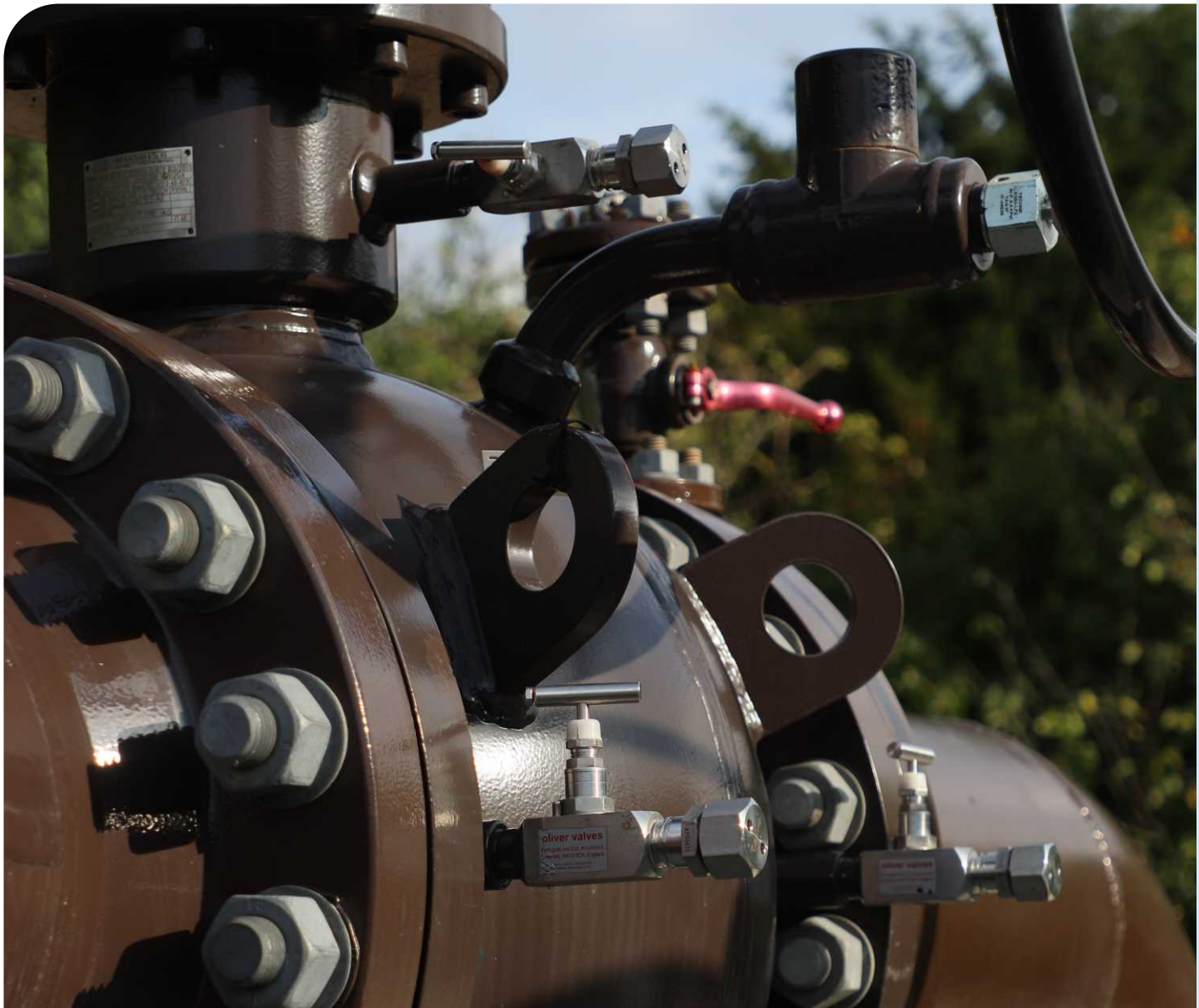
Cost of Living and Comfort levels

There is a long established link between domestic comfort levels and economic factors, such as energy prices and household disposable income.

Comfort levels are the measure within the analysis of a combination of reduced household heating temperatures along with the amount of time the heating is running.

This year's forecast has significantly higher domestic gas prices and reduced household disposable income early in the forecast period. The result is comfort levels reduce considerably in years two to three before slowly returning towards 2021 levels between 2026 and 2031 depending on the LDZ.

The cost of living increases result in the single largest impact in this year's forecast.



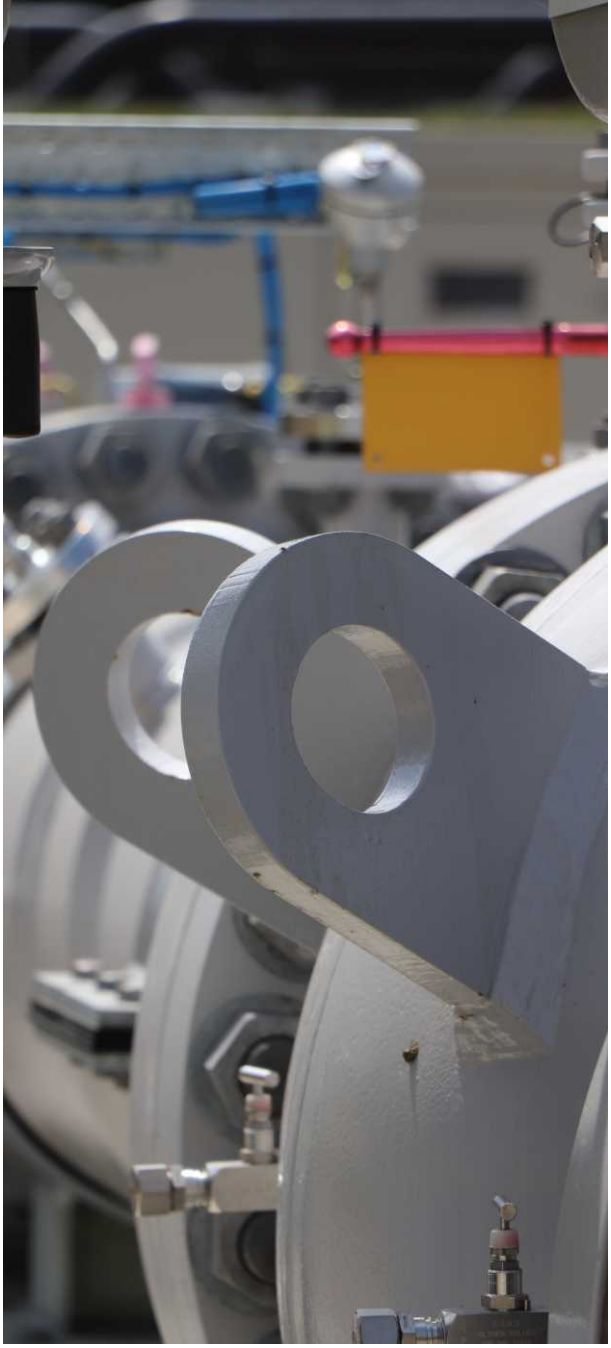
Embedded power generation

The UK's power networks continue to decarbonise with new renewable generation replacing existing conventional generation. The increase in renewable generation requires a greater amount of flexibility within the electricity system and much of this is being met with increasing amounts of small, flexible gas fired generation. This market is incentivised via the Capacity Mechanism.

We refer to these customers as embedded power generation and we have continued to see high levels of enquiries for them over the last year.

This highly variable demand creates a number of challenges for our network operations and planning processes. As many of these new sites are relatively small in terms of demand they do not always connect with Daily Metered contracts in place. Due to the fact they are supporting the electricity networks in delivering capacity they will come into operation as and when required. The result is they often use a different amount of gas at different times than advised during the pre connection request stage. The fact very few of these sites are Daily Metered therefore increases the risk our planning decisions may prove inaccurate.

This group of customers had already been identified as a sector whose demand requirements needed more detailed analysis. With the increasingly variable patterns of gas usage seen over the last year we will look for ways to connect more succesfully within our overall enhanced stakeholder engagament strategy.



New and existing embedded power has a higher impact on our peaks than annual forecasts. The expectation is this will increase over the ten years of the forecast.

As we use our peak forecasts to inform both our planning decisions and network operations, understanding these customers' demand patterns is extremely important to enable us to make the correct decisions.

Specific Large Loads

In addition to the increases within the embedded power generation sector, we have also seen significant increase and changes to patterns of demand with some of our traditional large power generation customers and large loads.

In our South East LDZ, our largest power generation customer increased its gas usage by over 50% more than they advised us they would use during 2021 at our annual bilateral meetings last year. This increase alone accounted for around 1.5% of overall LDZ demand and the customer has advised us of ongoing upgrades which will result in their annual demand and peak demand increasing even further.

In our South LDZ, one customer accounts for 12% of overall annual demand. During our annual bilateral meeting for this planning year they advised they are undergoing an expansion programme which will result in an increase to both their annual and peak demand. These increases are large enough to influence the overall picture of demand in this LDZ, more than offsetting any drop in gas demand we see from other factors.

Domestic Energy Efficiency

Our forecasting process looks at domestic energy efficiency improvements in detail and legislated boiler efficiency improvements continue to result in consistent reductions in gas demand which we expect will continue. However, there's only one large scale policy mechanism to improve thermal efficiency of our homes and this is ECO (Energy Companies Obligation).

Replacing boilers with more efficient models continues to have the largest impact on domestic energy efficiency for existing homes within our forecasts.

ECO has been largely designated for specific types of houses and sections of the population and as a result has had a relatively low impact historically which has been reflected within our previous forecasts.

This year, a revision to ECO has been released – ECO4. However, this revision was out for consultation at the time of this year's forecasting process and we have therefore chosen not to include any potential impact within this year's forecast. Our intitial analysis of the changes and revised scheme is any impact will remain fairly limited as ECO4 looks likely to continue to cover a relatively limited number of households. We will continue to review ECO4, incorporating any impacts within next year's forecast and including details of how it may have affected our forecasts within next year's LTDS.

We have used very little retrofitting of thermal insulation to existing homes within our forecast.

Smart Technologies

Our forecasts recognise the benefit of smart technologies in a home for lifestyle, convenience and the potential to increase efficiency in energy usage.

As in previous years, we have found smart meters have many benefits especially in a connected home. However, their overall impact on gas demand remains relatively low although much greater when it comes to managing electricity usage in the home which can have an effect on gas fired generation.

Smart controls such as Wifi and app-connected thermostats can have a greater impact than smart meters. However, their effectiveness is often lower than expected as installations often fail to include all the elements required to maximise the benefits.

We continue to evaluate smart technlogies although as yet there has been no change to this element of our forecast over the last year.

Smart Technologies have a low impact on gas demand forecasting in all LDZs.

New houses

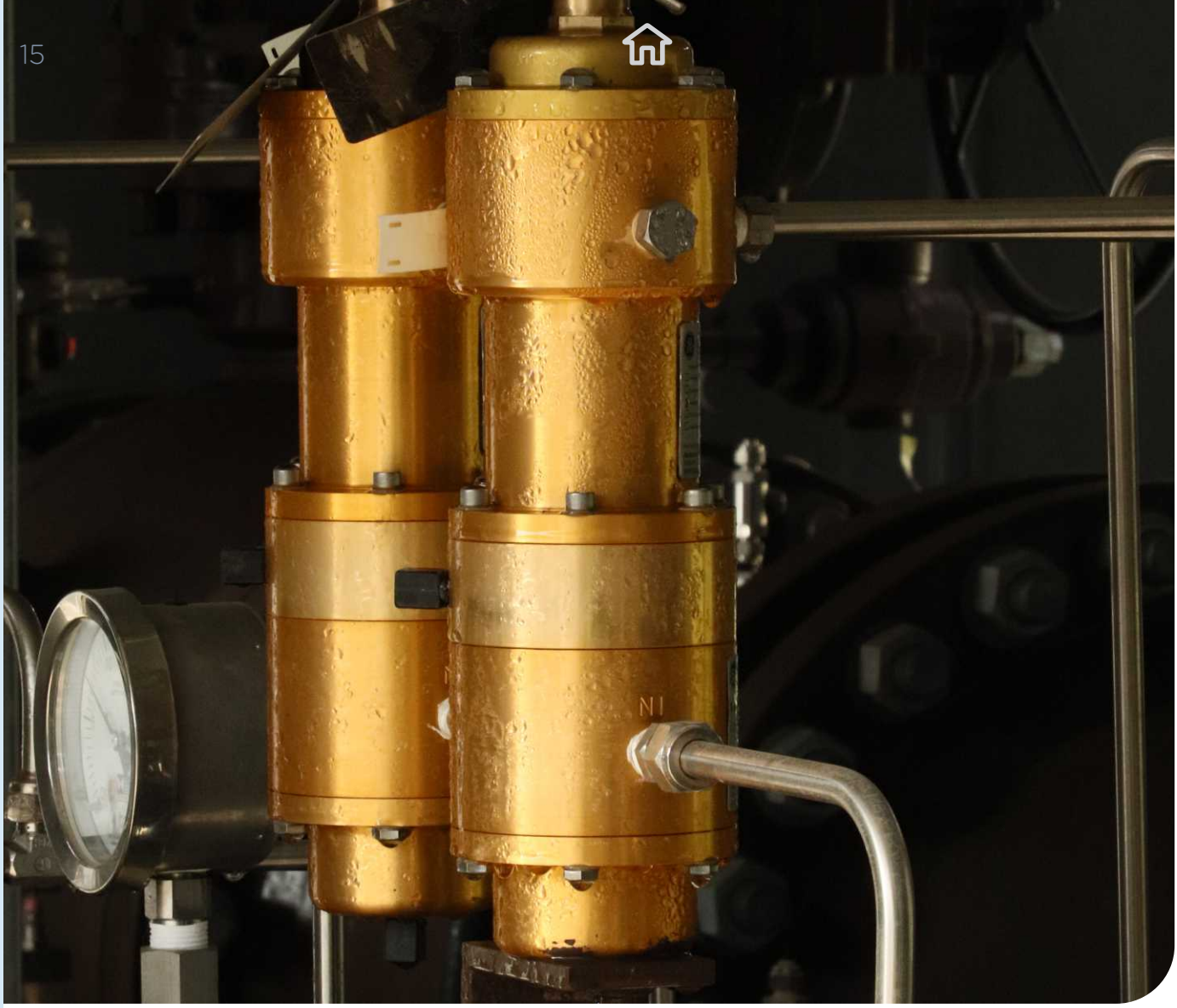
New houses have added relatively little to gas demand over the last ten years due to there being relatively few compared to the total number of houses and their heat demand being considerably lower, due to better building standards and more efficient boilers than those older homes yet to upgrade their heating systems. As a result, the impact new builds have on our forecast is relatively low.

The UK government has made it clear via the Future Homes Standard (FHS) they are looking to ban natural gas to heat new homes from 2025. The consultion phase for these standards will not complete until 2023 at the earliest. We have already begun work to understand the potential impact of the FHS, however, as these revised standards are not yet legislated, we have not included any of this analysis within the ten year planning horizon of this year's forecasts.

One of the reasons we take this approach is that due to the way the legislation is being proposed it may still be possible to install gas boilers in homes that are not yet completed up to a year or two after any ban and we would want to ensure any analysis considers the final wording of the legislation.

We noted in June 2022, the Committee on Climate Change (CCC) recommended a consultation on the full technical specification of the new standard take place in 2023 in order to allow legislation in 2024 to achieve the 2025 timescale.

In the meantime, an Interim FHS Standard which looks to increase thermal efficiency requirements of new houses has been legislated and this has been fully incorporated into this year's forecast.



Low carbon heating

The UK government has a target to install 600,000 heat pumps per year in houses in 2028. The Future Homes Standard and Boiler Upgrade Scheme (BUS) are two mechanisms to help achieve this target. More legislation and incentives are expected as the government aims to also focus on off gas grid houses to achieve this target.

However, only BUS has actually been legislated and only this is included in the forecast. Its impact on the forecast is low as the BUS only incentivises up to 90,000 heat pumps over the next three years.

Just under 30,000 heat pumps were installed in the UK in 2021, more than double those registered in 2019. Many of these installations were in new houses and existing homes not already benefitting from a gas supply. Heat pumps therefore have very little impact on our demand assumptions for existing homes with a gas supply or on new homes.

Hydrogen

As recognised in both the UK's Hydrogen Strategy published in August 2021 and reports by the Committee on Climate Change (CCC), significant amounts of low carbon hydrogen are going to be needed if we are to deliver the UK's net zero ambitions.

Renewables are by nature not always available and as the UK increasingly moves to rely on them as a primary source of energy, the need to support them with other types of energy for those times when they are not available increases. Gas-fired power generation is the preferred alternative to support the UK's energy mix as coal-fired and nuclear generation is decommissioned.

This has even been the case during times of what should have been relatively low demand this summer when the extreme heat events once again showed how demand is changing and the increased need to cool our homes and businesses we first saw in 2019 again disrupted the current energy mix.

If we are to meet our energy requirements in the years to come while relying on renewables, we are going to need some form of alternative for when renewables are not available, and if we are to reduce our natural gas usage, there needs to be an alternative – hydrogen can be that solution.

The UK government's target of 5 GW hydrogen production by 2030 and the aim for four industrial clusters shows their commitment to hydrogen, and we expect further policy announcements to follow to help achieve these targets as the government supports ongoing trials, research and innovation.

We have a number of projects in progress which are designed to help the UK meet our net zero targets including the potential role hydrogen may play in the government's heat in buildings strategy due to come in to play by 2026.

Click on a project below

Aberdeen Vision

Southampton Water

H100 Fife

LTS Futures

Currently we don't make any specific assumptions around hydrogen within our ten year forecast as it is looking like any benefits will not materialise until the late 2030s. However, we are beginning to see some of the learning from engagement with our customers and their intentions regarding reaching net zero are beginning to filter through into our assumptions via specific demand intelligence.

More detail

This section along with appendices A and B provide 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 in appendix C.

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 enable us to deliver our 1 in 20 licence obligations, ensuring our domestic customers can benefit from an affordable, safe and reliable supply of gas.

Forecasting process

We continue to work with expert industry partners when developing our annual forecasts. The starting point being actual demand data from the previous year which is then analysed along with information gathered from a number of sources including UK government departments and industry experts. The outcomes of the annual analysis are tested against our previous year's forecast to improve accuracy year-on-year, giving us greater confidence when planning works on our networks and the suitability of investment decisions we make on behalf of our customers.

Over time, this forecast methodology has proven very reliable in ensuring we're able to keep the gas flowing, even during more challenging times of unusually adverse weather, such as we saw in late February and early March 2018 and more recent cold periods during 2021.

This year, Xoserve have made some alterations to their processes which has resulted in changes to the historic trends in some sectors which we have reflected within our 2022 forecast.

Validating our 1:20 peak day

A 60-year weather dataset is used to establish 1 in 20 peak weather conditions, with the last 20 years used to establish potential peak demand conditions.

Particular focus is paid to the cold periods of 2010, 2011 and 2018, with the cold period of 2018 used to calibrate our peak demand forecasts. This year, along with improved site-specific intelligence, we have corroborated this analysis with demand during the colder weather periods in 2021, which also had some notably cold days, with favourable results and adjustments made for minor changes in annual demands between years.

Improving our forecasting process

While our forecasting regime has served us and our customers extremely well, we recognise the UK's energy infrastructure will be undergoing significant changes to facilitate a low carbon future and this requires us to understand the role we will play within the energy mix. In recognition of this, we are increasing our engagement year on year with our customers and industry partners including other GDNs and National Grid.

Our ten year forecast is based specifically on current energy markets, policies, and incentives, including changes which we know are happening, but not changes that 'may' happen. This has to be the case as gas networks need to be planned on what's known and not on 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 Grid for its **Gas Ten Year Statement (GTYS)** and other publications and consultations including the Future Energy Scenario process (FES).

Demand forecasting process

Here we show how demand based on weather corrected actual throughput numbers changed in 2021 and how we approached our 2022 forecasting process.

As you read this information, please be aware when we talk about a particular year's forecast it generally relates to the current year's ten year forecast. Also, when we refer to our networks we generally only talk about Scotland and Southern, although for the purpose of regulatory reporting we are uniquely required to discuss our local distribution networks (LDZs) individually. So, you'll also see 'Scotland' and for Southern, 'South East' and 'South' shown separately.

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

Movement in domestic demand in all three LDZs has been minimal within this year's forecast mainly due to very little activity in retrofitting insulation in existing homes and potential demand increases from new build homes being offset by installation of energy efficient boilers. There was also very little change in domestic comfort levels in all LDZs with the amount of change reducing considerably from a general trend of moderate historic year on year increases to very low levels of change. Our view of why this has occurred is a combination of improved post-COVID-19 economics offset by impacts of rising domestic gas bills from late 2021 for large proportions of the population. The net result has been domestic demand changing by less than 1% in all LDZs.

Scotland LDZ: We saw a 0.3% increase in gas demand between 2020 and 2021, mainly due to minor increases in household comfort levels and the above-mentioned impact of new houses being offset by energy efficiencies.

The impact of new houses in Scotland has been marginally higher relative to our other LDZs due to more homes being built in Scotland and colder average temperatures. However, domestic demand overall is more than offset by slightly higher energy efficiency than other LDZs due to Scotland's higher levels of retrofitted energy efficiency.

While the increase in domestic comfort level was much lower than historically seen, at around a third of the five year average, it was higher than the other LDZs. When combined with the other demand changes, this accounts for the reason this LDZ experienced a minor rise in demand, when the other LDZs had slight reductions.

South East LDZ: Historically our South East LDZ has seen comfort levels increasing year on year but for the last few years this increase has reduced annually. While the change in comfort levels this year is almost negligible, this was the only LDZ to experience a reduction in comfort levels.

Although improvements in energy efficiency were less than we see in the Scotland LDZ, they were only slightly less. With less new demand from new houses and the comfort levels mentioned above taken into account, this LDZ experienced the highest reduction in domestic demand of all three LDZs with a reduction of 0.9% between 2020 and 2021.

South LDZ: The South LDZ had similar levels of energy efficiency improvements and new housing as South East LDZ. However, comfort level changes were very slightly higher than South East LDZ but not as high as Scotland LDZ, so although we saw an increase, as with our other LDZs, the amount of change was much less than in recent history, at around a fifth of the five year average. It's worth noting historic comfort level changes in this LDZ are not as high as in the Scotland LDZ.

As a result of all these factors, the change in domestic demand in this LDZ was between South East LDZ and Scotland LDZ decreasing very slightly between 2020 to 2021 by 0.3%.

73-732 - Commercial

The commercial sector has seen positive growth between 2020 and 2021, largely as a result of an improving post-COVID-19 economic situation as demonstrated by economic indices including GDP and commercial outputs, both experiencing growth in 2021 although not fully recovering from the decline during 2020.

As a result, this sector has almost returned to pre-pandemic levels of gas demand across all three LDZs with both Scotland and South East LDZs seeing a 4% increase in gas demand after

the reductions of 6% the year before and the South LDZ experiencing a lesser increase of 2% after the previous year's decrease of 5%.

>732 - Industrial

The industrial sector takes in a wide range of industries with various types and sizes of demand. As a result, the factors which go into understanding changes in demand are complex.

Generally, we have seen small industrial customers largely recovering from economic impacts of COVID-19 over the last year with levels of demand nearing pre-pandemic levels across all three LDZs, with our Scotland LDZ demand returning to within 4%, South LDZ within 3% and South East LDZ within 2% of 2019 demand levels.

Larger industrial customers saw a smaller year on year change mainly due to their operations being less affected by COVID-19 in the previous year. In Scotland and South LDZs, demand from our larger daily metered (DM) customers sector was almost the same as the year before with neither changing by more than 0.5%.

If we exclude the largest power generation load in South East from the demand assumptions, the overall change would be minimal. However, this customer increased its demand by just over 50% from the previous year and this led to total demand for DM customers to increase by 13.4%.

This demonstrates the impact power generation can have on our demand forecast and our reasons for continually discussing the need to improve the data we are able to gather for this sector as many embedded power generation sites are currently not DM which limits the information we have to improve the accuracy of our forecast and planning processes.

Approach to the forecasting process

Our forecast utilises a detailed, granular, bottom-up approach wherever possible but particularly within the domestic demand sector. 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.

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 the UK looks to achieve more stringent low carbon targets as it allows us to benchmark our analysis against wider industry analysis to better understand what needs to be done to help the UK to decarbonise.

Importantly, our forecast is developed using current behaviours and government policies rather than scenario-based top down analysis which generally defines a desired end point before working backwards over the forecasted period and applying possible sensitivities until the desired outcome has been achieved.

An example of the benefits of this methodology is how it allowed us previously to isolate the specific impacts of COVID-19 and, this year, the increasing cost of living on demand.

This approach has been predominantly applied to our domestic forecasting and increasingly our forecast of specific 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. This is particularly relevant for new power generation sites as they connect as they have a relatively high impact on our demand due to their variable flow patterns. The 'bottom-up' approach covers around three quarters of our forecast demand.

In our appraisal of the best way to incorporate the impacts from the increased cost of living and fuel prices on demand we recognised at peak weather conditions, comfort requirements will generally override economic considerations with households maintaining heat levels within the home. As a result, we incorporated a degree of smoothing to remove the worst of the impact from the econometric analysis on domestic demand. There still remains a fairly significant dip in demand for the first two years of the forecast before recovery begins in year five.

An example of this is shown in Figure 1 for illustration.

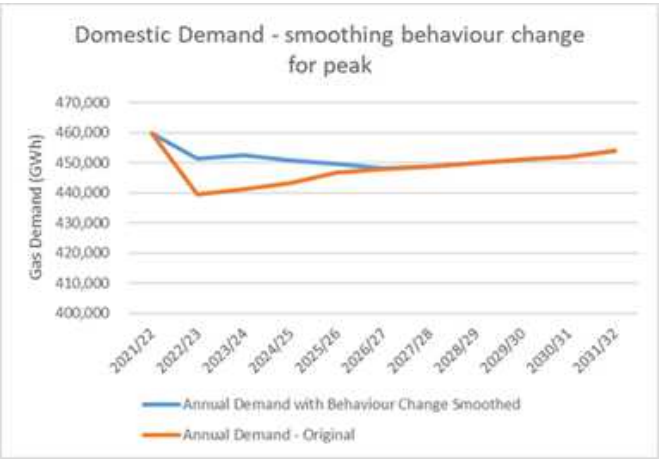


Figure 1: Example of smoothing on Peak demand

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 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: BEIS, English and Scottish housing surveys, Ministry of Housing, Communities & Local Government (MHCLG), Heating and Hot water Industry Council (HHIC), as well as the Energy and Utilities Alliance, among others.

The reasons for gas demand changes over the last ten years can be seen in Figure 2 Ten year view of domestic demand factors. 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 in the last decade, more than all other efficiency measures.

Conversely, there have been high increases in comfort levels and while this has increased over the last decade, the events of 2020 appear to have stopped this trend and increases have since levelled off. This shows a potential for gas demand to decrease if households revert to comfort levels of ten years ago.

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

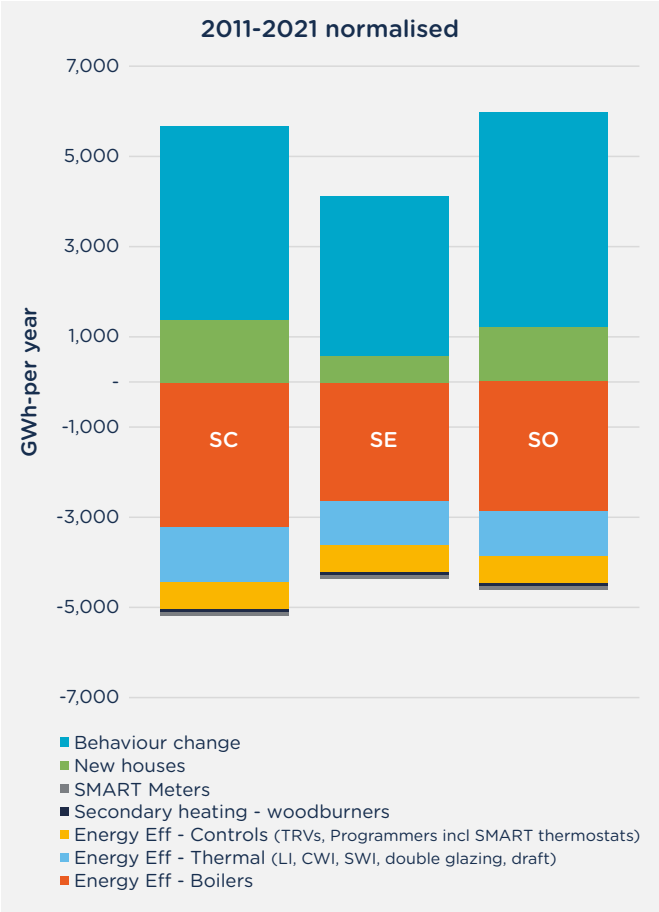


Figure 2: Ten year view of domestic demand change

Energy efficiency in the home

Loft, cavity and solid wall insulation as well as double glazing efficiency levels improved considerably under the Carbon Emissions Reduction Target (CERT) which ran from 2008 to the end of 2012.

Since CERT has closed, rates of retrofitting energy efficiency measures have reduced significantly. The main scheme currently incentivising retrofit insulation is Energy Company Obligation (ECO). ECO is due to receive an update later this year to ECO 4.

Boilers

The UK government's mandate in 2005 for all new gas boilers to be higher efficiency condensing boilers has made this the element of greatest reduction in gas demand in the domestic sector. There's still a high number of boilers which haven't been replaced and replacement rates remain at around 1.5 million a year nationally over the last year; condensing boilers are also more efficient than those from 2005. This leaves considerable reductions still to be gained in gas demand from replacing not only old non-condensing boilers but also an earlier older condensing boiler with a more modern model. This has been reflected in our forecast

and, with the exception of behaviour change, in this year's forecast it remains the single largest element reducing gas demand across all of our networks.

Controls

Here we refer to thermostatic radiator valves and programmers including SMART thermostats. These have created a notable but relatively small reduction in demand over the last decade. We've included a consistent level of impact as before within our forecasts going forwards but there is still the possibility for more gains to be had from these technologies.

Secondary heating - wood burners

Wood burning heating has had somewhat of a renaissance recently. However, at the same time, it has also come under some scrutiny for the impact it has on air quality, with the UK government introducing legislation to help curtail associated emissions.

The recent increase in installations aside, wood burners have a very low influence on gas demand due to relatively few being installed as a primary source of heat and the impact we allow within the forecast is very low.

Smart meters

As established from customer trials, smart meters are determined as a low impact element of the forecast due to a minimal effect they have on reducing gas demand. Therefore, currently their impact on gas demand is forecast to be very low. However, we are aware they have a greater influence on electricity usage and as a result may offset some of the generation requirements from gas-fired embedded power.

New homes

The potential impact from new homes is important but not as high as may be thought. This is due to the relatively low numbers being built relative to existing housing stock and those which are built having very low gas demand compared to the existing housing stock, mainly due to their high levels of thermal efficiency.

Over the next ten years, due to incremental increases in energy efficiency, the impact is forecast to be similar but slightly lower than the last 10 years. We've included the impact of the Interim Future Homes Standard on energy efficiency of new homes into our forecasts as this has been announced as new legislated policy, but we've not included the full Future Homes Standard as it remains at the consultation stage at the time of writing. Our expectation is the government will consult about technical aspects of the Future Homes Standard in 2023 before again updating the regulations prior to them coming into force in 2025.

Behaviour change

Since 2008's recession, there have been fluctuations in economic activity but with a general increase in prosperity resulting in an average annual increase in gas demand of around 1%, directly related to increasing comfort levels or the temperature which people heat their homes, which broadly equates to an annual increase of 0.1°C on average.

This year, large increases in the cost of living and gas prices have meant the behaviour change element of our forecast is the largest single factor impacting on gas demand over the next few years, much more than seen previously, with approximately a 5% reduction in demand as a direct result of behaviour change over the next couple of years. In our forecast, behaviour change is forecast through our 'top-down' econometric forecasting process. The main factors to influence this are domestic gas prices and Household Disposable Income (HHDI).

In the short to medium term, higher gas prices and lower HHDI reduce comfort levels in all LDZs significantly reaching their lowest in the forecast before slowly starting to return towards current levels around 2024. There are differences in LDZs with Scotland LDZ eventually returning to 2021 levels in 2031, South LDZ in 2029 and South East LDZ in 2026.

Domestic efficiency policy

Boilers

As mentioned earlier, the 2005 regulation requiring all new boilers to be condensing boilers has driven considerable reductions in domestic gas demand and continues to do so, being the single largest element of demand reduction within our forecasts. The 2018 Boiler Plus regulations essentially strengthened the 2005 regulation mandating what was already occurring, mainly new boilers need to be above 92% efficiency levels. This is reflected in our forecasts.

ECO (Energy Companies Obligation)

ECO started relatively strongly in 2013 with nearly 500,000 installs that year. This has since reduced annually to less than 150,000 in 2021. ECO is not the only means for increasing retrofitting energy efficiency measures but it accounts for a considerable number of overall installations. We use ECO as part of our understanding of the underlying reasons for insulation measures reducing.

In 2018, a rule change allowed ECO obligations to be satisfied through boiler replacements and not through retrofit insulation. This has shifted focus away from retrofit insulation to boiler replacement, the result being reductions in retrofit insulation rates in existing buildings.

The UK government released details this year of further changes to ECO with ECO4. At the time of our forecasting process and subsequent production of this year's LTDS, ECO4 was still in consultation so we have not included it in this year's forecast. Expectations are it will be ready for inclusion within next year's forecast with early indications suggesting it may look to increase retrofit insulation levels. However, our early analysis suggests this won't have a large impact on demand.

Green Deal

The Green Deal was introduced in early 2013 as a follow up to the Carbon Emissions Reduction Target (CERT) which ran from 2008 to the end of 2012. It had limited impact throughout its run with installation numbers falling year on year until its closure in 2015. Its replacement was the Green Homes Grant, announced in July 2020.

Green Homes Grant

The Green Homes Grant was a £1.5bn programme which offered households grants of £5,000 to £10,000 to install insulation or low-carbon heating. It was announced in July 2020 but suffered problems from the start and was scrapped in March 2021. Government figures[2] suggest just under 50,000 of the targeted 600,000 measures were installed.

Renewable Heat Incentive (RHI)

The Renewable Heat Incentive was introduced in April 2014 to incentivise retrofitting of renewable heat in homes and businesses. It led to a consistent but relatively small number of renewable heating installations, with the domestic side of the scheme resulting in 10,000 installations of heat pumps each year across Great Britain, some of which replaced natural gas as a source of heat in homes.

The RHI scheme finished in March 2022 and was replaced by the Boiler Upgrade Scheme. Considering the end date and installation numbers, we've not created a separate forecast for RHI as the impact on our gas demand has been low. Any changes to the number of gas heated house numbers are also captured in our base data from Xoserve and BEIS.

Clean Heat Grant renamed Boiler Upgrade Scheme

In last year's LTDS, we covered the 'Clean Heat Grant' as the RHI replacement. This scheme has been renamed as of April 2022 as the Boiler Upgrade Scheme (BUS) and now offers £5,000 off the cost and installation of an air source heat pump and £5,000 off the cost and installation of a biomass boiler, or £6,000 off the cost and installation of a ground source heat pump to replace a gas boiler. Unlike the RHI, it's a domestic only scheme and at the time of writing there was no non-domestic replacement for the equivalent RHI.

BUS is intended to last for three years with its funding being capped at £450m. This could potentially fund the equivalent of 90,000 air source heat pumps over its lifespan however our analysis shows the numbers of installs are more likely to be in the region of 15,000 per year and we have therefore capped the potential number of installs at this level to ensure we do not make an over allowance for their impact. We will review this assumption each year and adjust accordingly.

[2] Green homes grant voucher programme (parliament.uk)

Economic inputs

Each year, our forecasting process evaluates historic changes in demand with a large range of economic indices with those which return the best relationship with demand used within each year's forecast analysis. The cost of living is a significant factor within the economic inputs of our 2022 forecasts, dominating our forecasts. The economic indices which we use are detailed below.

Gas prices - wholesale and industrial

During 2021, a combination of well publicised factors created unstable wholesale gas prices reaching a year end peak of around 450 p/Therm before collapsing and steadying in early January and February 2022 to around 200 p/Therm, then steadying before another spike in March this year, at the time of producing our forecasts of around 500 p/Therm. Prices since have seen another drop in April before steadily rising again.

In our forecast, wholesale prices remain high throughout 2022 before slowly decreasing in subsequent years, although they remain above 2020 levels.

An historical linkage to domestic, commercial and industrial gas prices have been used to create price forecasts for these sectors. This connection results in prices in all sectors remaining higher for a little longer than wholesale prices due to delays in linked prices.

Our assumptions around domestic gas prices also take account of the domestic price caps at the time of the forecast. Gas price has an impact on all sectors of gas demand but has the largest impact on the domestic behaviour change element of our forecast as it is one element of the impact on increasing living costs.

It should be noted prices were forecast early in 2022 during our data gathering period for our forecasts and therefore price fluctuations since are not considered.

Household disposable income

This has had a large impact on our forecasts this year with increasing costs mainly from increased food and transport factored into our forecast of household disposable income (HHDI).

Our assessment of HHDI over the forecast period of ten years is aligned to the UK's economic recovery following the 2008 recession. This economic pattern defines the domestic behaviour change element of our forecast resulting in a notable reduction in the first few years of the forecast before recovering to 2020 levels in years five and six.

It should be noted that HHDI is only one element of the cost of living, with gas prices, as discussed elsewhere, also having a high impact, these are included as a separate element to avoid cross influence of non-connected factors within the analysis.

Manufacturing output

The ONS is also a source of information for local outputs and national inputs relative to manufacturing for inclusion in our econometric forecasting. We've seen year-on-year variations in national and regional output but a clear long-term trend of consistent increase which is forecast to continue.

This data is granular and used according to suitability relative to the individual LDZ. In our Southern area for example, the local outputs are used to forecast smaller manufacturing sectors as this gives us better relationships with historic demand while enabling more specific forecasting for the two LDZs.

As with service sector output this year, we've included in our forecast a return to pre-pandemic levels and levels of growth by 2024.

GDP

As a standard, we base our forecasts of GDP on the latest available OBR forecast, this year using the central forecast announced in October 2021.

The OBR forecasts show after a dip of 9.9% in 2020, an increase of over 6% in 2021 followed by a forecasted increase of nearly 6% in 2022.

These increases reduce year on year to an enduring growth of 1.7% from 2025.

See Figure 3.

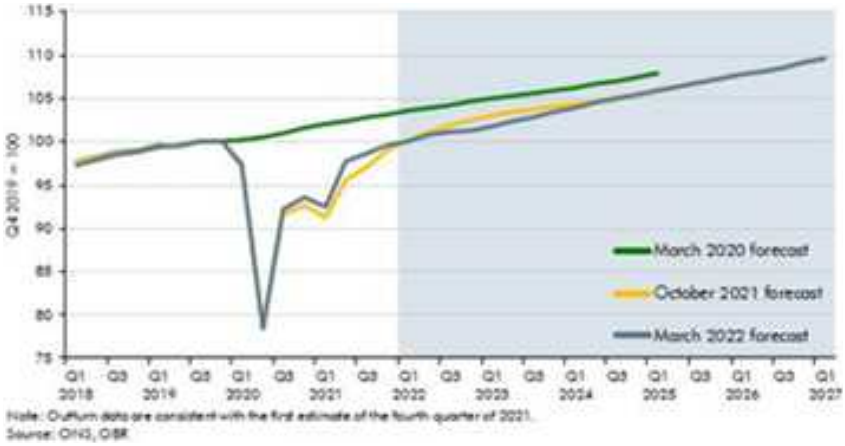


Figure 3: Source: Office of Budget Responsibility

Inflation

Food, energy and transport costs are some of the key elements contributing to the recent rises in inflation. While these relate to the increased cost of living, the relationship of inflation to historical demand was not significant enough for us to include it as an individual index within this year's forecasts. We will re-evaluate and include within next year's forecast if appropriate.

See Figure 4.

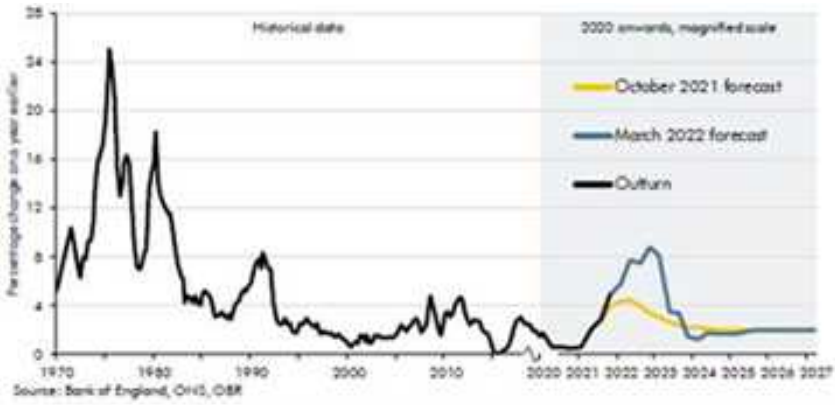


Figure 4: Source: Office of Budget Responsibility

Service sector output

We use both national and local service sector output indices best matched to an individual LDZ. Both national and regional outputs are sourced from the Office for National Statistics (ONS). After many years of strong growth, they currently show a substantial reduction in 2020 with recovery in 2021 but not quite back to pre-COVID-19 levels. This year, we have included in our forecasts a return to pre-pandemic levels and levels of growth as if no pandemic occurred by 2024.

Jobs in each region

We also source this data from the ONS, separately analysing the data for commercial, industrial and total jobs to include a factor within commercial, industrial and domestic demand. This year, the jobs per region analysis has influenced demand to varying degrees depending on the LDZ but to a lesser extent than changes in gas prices and HHDI.

Again, we've included within this year's forecast a return to pre-pandemic levels and levels of growth by 2024.

Regional and specific variations

Behaviour change

This is assessed on an individual LDZ basis using a mixture of national and regional economic indices against a background of historical data.

The result being for our Scotland LDZ behaviour change returns to 2021 levels in 2031, South LDZ in 2029 and South East LDZ in 2026.

Domestic energy efficiency

We use geographical area-based data from BEIS which shows the installation of domestic energy efficiency measures which we update each year mapping them to our LDZs via postcodes.

Some key points to note are:

- Housing in Scotland benefits 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 more energy efficiency projects in Scotland proportionally than in England, especially with regards to those who are considered to be fuel poor.
- Scotland also has slightly higher boiler replacement rates. As with insulation, this is partly because the devolved government considers housing as an infrastructure asset.
- 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.
- The Boiler Upgrade Scheme (BUS) only applies to England and Wales. Scotland does not currently have the same legislation in place
- At the time of writing Scotland's New Build Heat Standard II, which looks to restrict direct emission heating systems in new buildings both commercial and domestic, was out for consultation. Details of the final scope of the scheme are expected late 2022 with possible implementation in April 2024. We will continue to monitor developments, incorporating any legislation which impacts demand in Scotland into our analysis as appropriate.

Embedded power

As the UK's electricity system decarbonises and introduces more renewable technologies, the need to back these up with others forms of generation increases. The UK government incentivises this backup market through the Capacity Mechanism to ensure the electricity networks have the required flexibility at times of low or no renewable electricity generation. A considerable amount of this backup, which we refer to as embedded generation, is gas-fired as it's a low-cost established technology which is currently lower in carbon than many alternatives.

Our forecast analysis shows an increasing need for flexibility within the electricity networks will result in the number of embedded power stations growing considerably. There are variations to the amount of embedded generation required within each of our LDZs, however Scotland has seen the highest level of new embedded power generation quotation acceptances over the last year, with the number of acceptances nearly 50% higher than South LDZ and double the amount for South East LDZ.

Unlike the majority of our customers, embedded generation customers rarely use gas in a standard profile – that is, they will use varying amounts at different times of the day and potentially differently each day. Ideally, we would have Daily Metered (DM) data to ensure we are able to allow for these sites while ensuring we are able to maintain our 1 in 20 security of supply obligations. Unfortunately, many of these customers connect without DM arrangements in place.

We continue our efforts to better understand this customer group's demand requirements, including improving engagement with them and looking at other modelling capabilities using data published by NG ESO. This modelling is currently under test alongside our core forecasting analysis to determine whether it supplies either more accurate results or allows us to reduce our reliance on the informed assumptions which we currently have to use in lieu of DM data.

As part of our data gathering, we note analysis conducted by National Grid ESO for their ETYS[3] suggests there may be an increased requirement for new embedded power connections in the South and South East LDZs along with an increase in demand from those already connected. National Grid's ETYS shows this as required to help alleviate network constraints from electricity transmitted from the north of London to meet demand within the south of England.

> National Grid ESO state: *"The high demand and power flows may also lead to voltage depression in London and the south east. The closure of conventional generation within the region will present added stability and voltage depression concerns which may need to be solved through reinforcements."*

We will continue to monitor developments, engaging with National Grid ESO via our regular bilateral meetings to help inform our forecasts.

Large loads

Daily Metered demand (DM) is dominated heavily by one large site in South LDZ and two large sites in South East LDZ. Our customer in our South LDZ is currently in the process of a substantial expansion and in the South East LDZ, one of these customers' patterns of demand has been varying considerably each year compared to the information they supplied during our annual engagement meetings. This customer's site is also due an upgrade which will increase its peak demand and potentially further disrupt its patterns of demand.

These two customers heavily influence the demand forecast for our southern LDZs due to the volume of gas consumed and the variations in demand. As a result, we have seen a more variable pattern of demand in both the South and South East LDZs, creating challenges with both long and short range forecasting. In Scotland, we don't currently have any similar sized customers influencing demand to such an extent and demand is more consistent as a result.

Service sector econometrics

Our analysis continues to show the South East LDZ's services sector will be more affected by the long term impacts of COVID-19, largely due to the implications of population density and expense for service sector premises in London. As a result, employment and output remain limited from the middle of the forecast for this LDZ. These are constituent parts of the econometric forecast for South East LDZ which we do not make for Scotland and South LDZs as these dynamics have less impact outside London. However, this remains a relatively small part of the South East LDZ's demand, accounting for around 10% of the overall demand.

[3] ETYS – Electricity Ten Year Statement - Electricity Ten Year Statement (ETYS) 2021 | National Grid ESO

Forecast methodology

In 2021, Ofgem introduced the 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. This can 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 2031/32. 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 31, 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 gas demand and the forecast going forward. Note the large reduction in the first year of the forecast due to reductions in all sectors, mainly due to increases in fuel prices and cost of living, and impacting the domestic sector, via domestic behaviour changes from people reducing heating temperatures and length of heating season, in the bid to reduce costs. This largely outweighs reductions in 2019 and 2020 that were highlighted as significant. In 2019, this was due to one of our largest loads reducing its demand, then demand remaining low in 2020 as partial recovery from the large load offsetting wider reductions due to COVID-19. Southern LDZs show slightly less of a dip and a quicker return than Scotland LDZ. This is mainly due to increases in our largest site in Southern LDZ offsetting the impacts on reduction from domestic customers. As previously stated, the behaviour change element of the domestic forecast that contributes to the dip in 2022 is removed from the peak forecast. The reason for this is the need to stay warm in the very coldest conditions outweighs the requirement to save on bills in a 1 in 20 peak day.

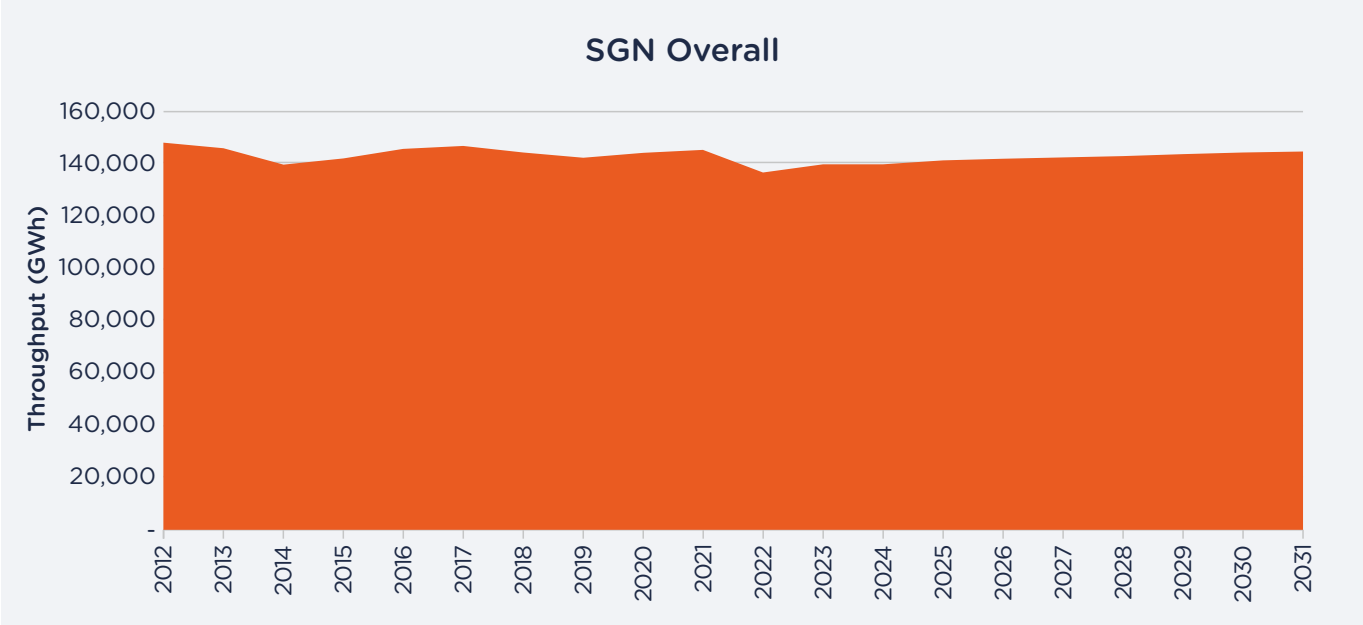


Figure 5: Change in historic and forecast annual demand - SGN overall

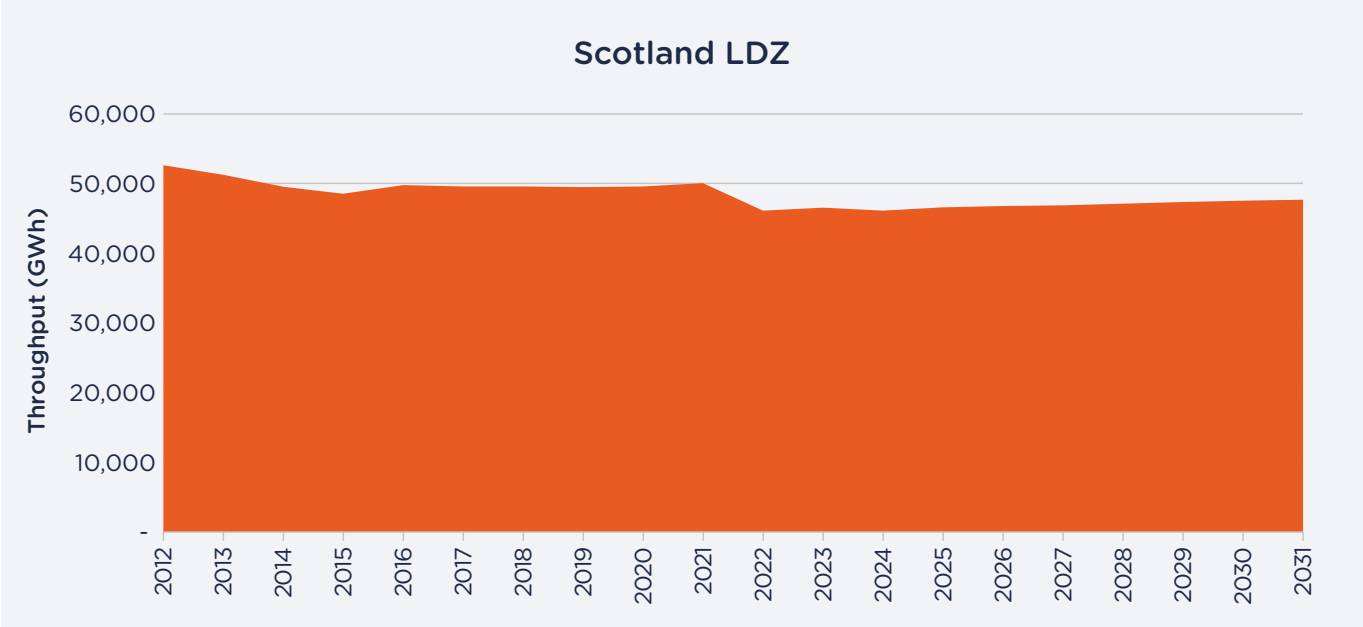


Figure 6: Change in historic and forecast annual demand – Scotland LDZ

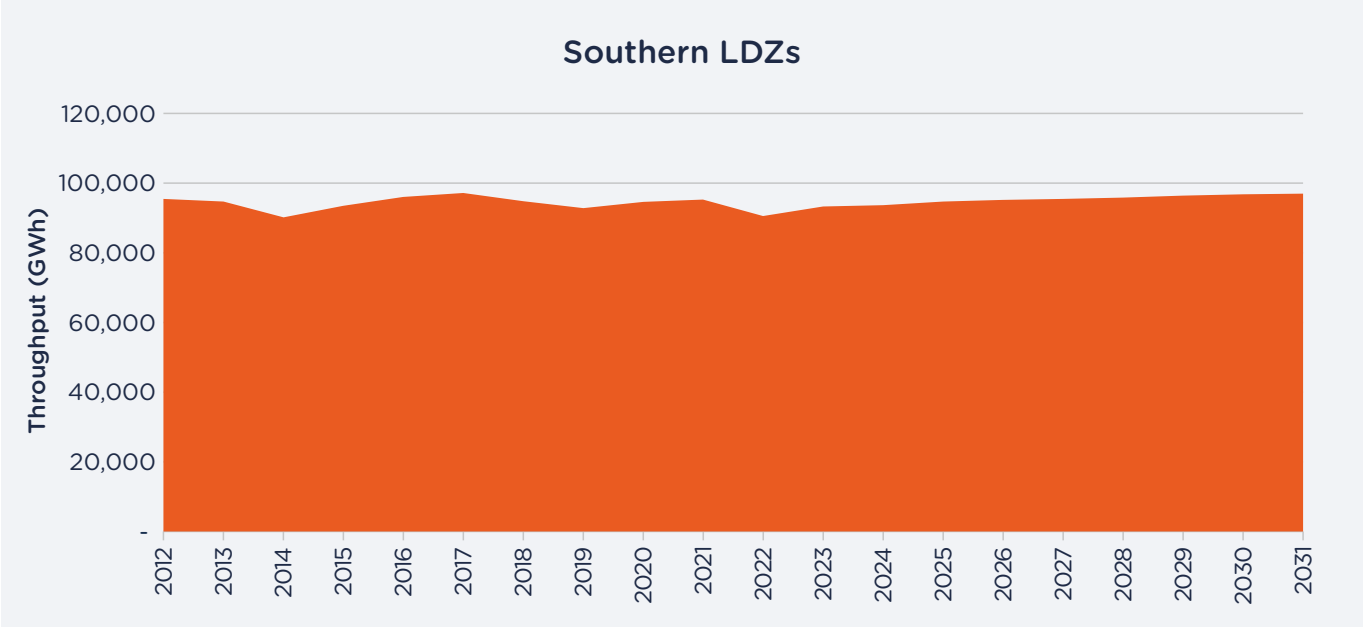


Figure 7: Change in historic and forecast annual demand - Southern LDZs

Average annual change in forecast Annual demand growth (2021–31)			
	SGN	Scotland	Southern
Annual demand growth	-0.05%	-0.5%	0.2%

Table 1: Change in forecast Annual demand growth (2021 - 31)

Peak demand

The following graphs show the equivalent view for peak demand. Peak demand is the key driver for investment in SGN. As stated previously, the majority of the forecast reduction in annual demand due to domestic behaviour change in 2022 is not reflected in the peaks forecast. This lessens the dip in peak demand compared to annuals.

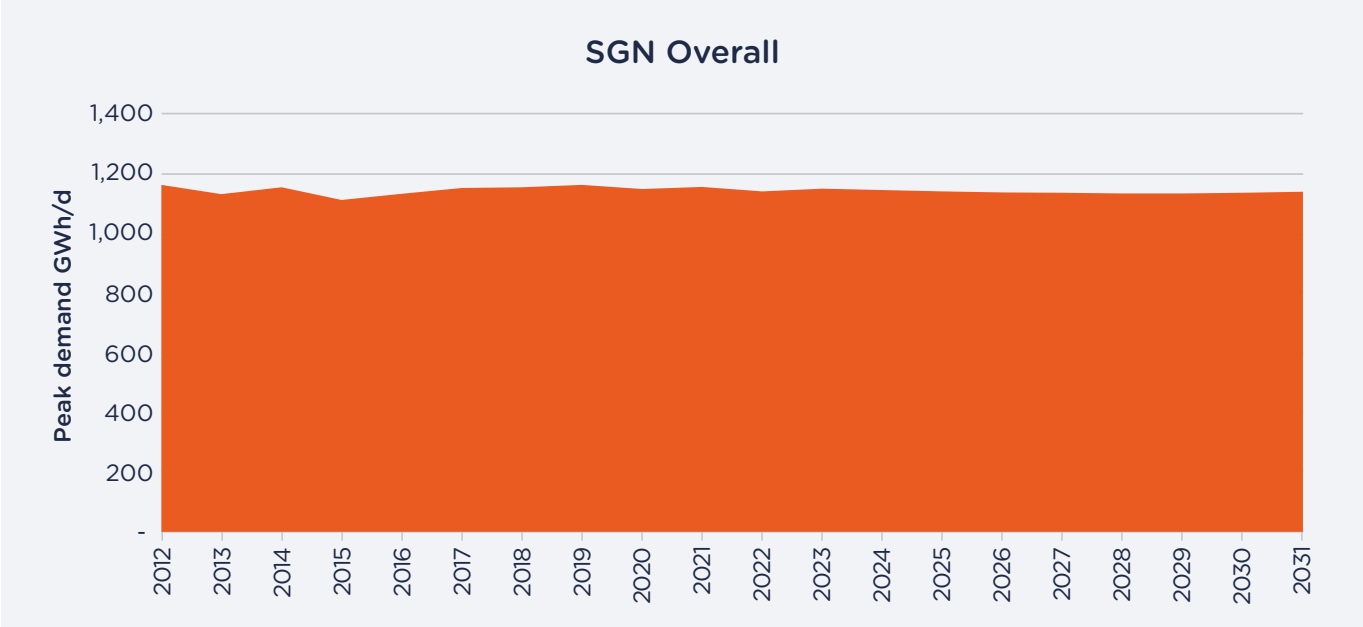


Figure 8: Change in historic and Peak demand - SGN overall

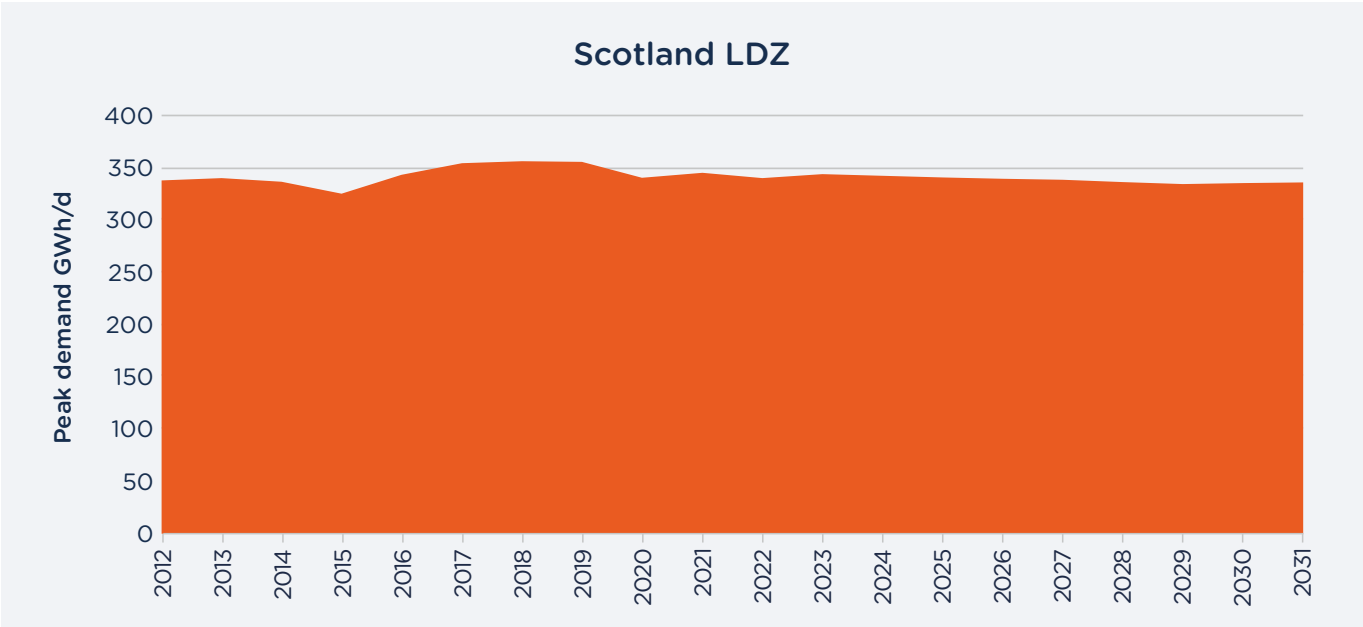


Figure 9: Change in historic and Peak demand - Scotland LDZ overall

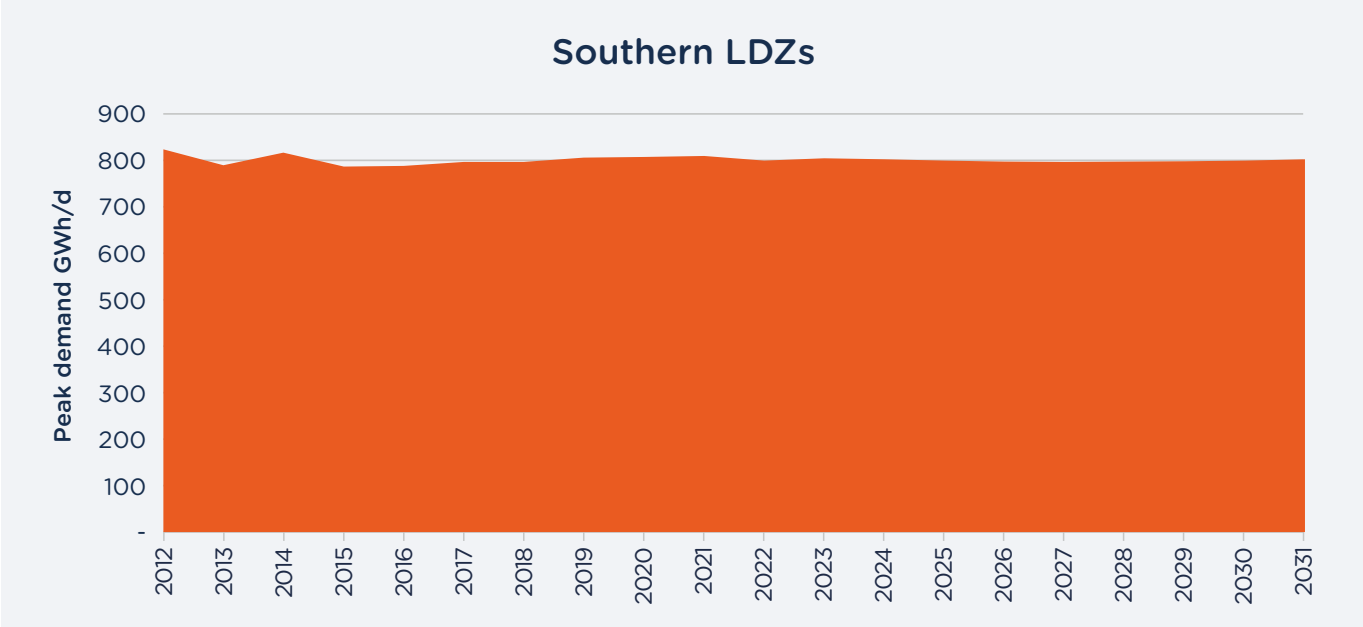


Figure 10: Change in historic and Peak demand - Southern LDZs

Average annual change in forecast Peak demand growth (2021-31)			
	SGN	Scotland	Southern
Peak demand growth	-0.1%	-0.3%	-0.1%

Table 2: Change in forecast peak demand growth (2021-31)

Forecast comparisons

Scotland LDZ

Scotland has very little overall change in peaks compared to last year throughout the forecast period.

With the exception of the behaviour change element of domestic demand over the next few years, which does not impact our peak for reasons described earlier, annual demand is generally similar. We see a very slight increase in the starting point (0.3%) as the result of a reconciliation of historic demand carried out by Xoserve.

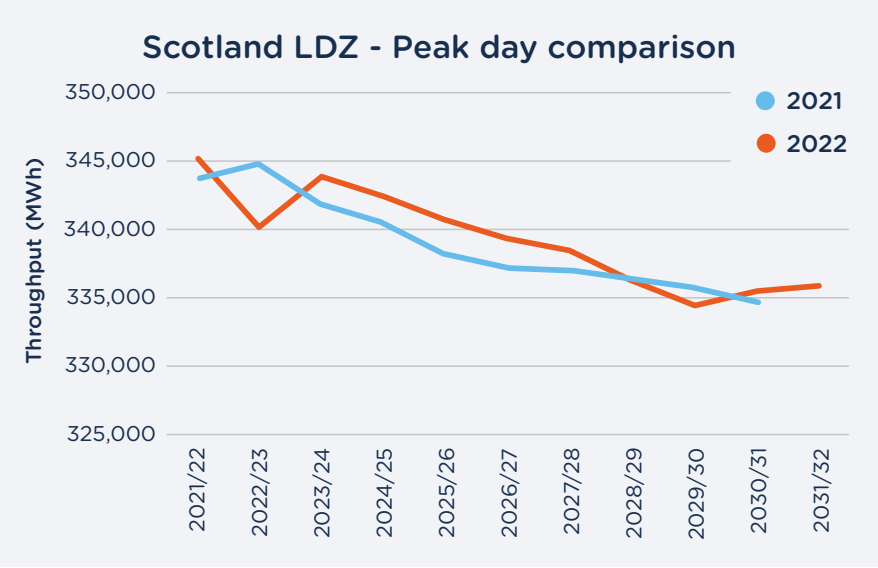


Figure 11: Scotland LDZ Peak Day Comparison

This is offset by a slight change in 1 in 20 CWV (0.2%) and there is also slightly less accepted embedded generation awaiting connection. The dip in 2022/23 is due to reductions in commercial and industrial activity which reduces their annual demand in 2022/23 before an amount of recovery in 2024, which along with increases in embedded generation results in the 2023/24 increases seen in Figure 12

South East LDZ

Throughout our forecast period, the South East has lower Peak demand than last year's forecast. The main reasons for this being reconciliation changes to historic data from Xoserve and a reduction in levels of Annual demand.

We see a decrease of 1.6% in the starting point from the reconciliation changes with this accounting for the greater difference between this and last year's forecasts.

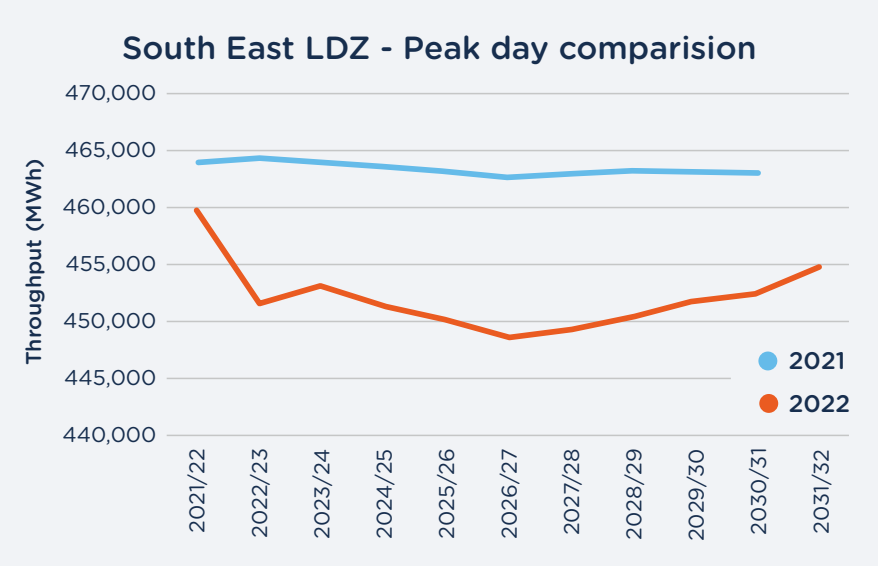


Figure 12: South East LDZ - Peak day comparison

Lower annual demand in the commercial and industrial NDM sectors has resulted in just over 1% of the difference with changes in embedded generation awaiting connection having a minor impact of 0.2% difference between the two forecasts.

Unlike our Scotland LDZ, there is almost no change in the 1 in 20 CWV and consequently the impact is negligible. Overall, our Peak forecast is generally around 3% lower than last year, due to these factors.

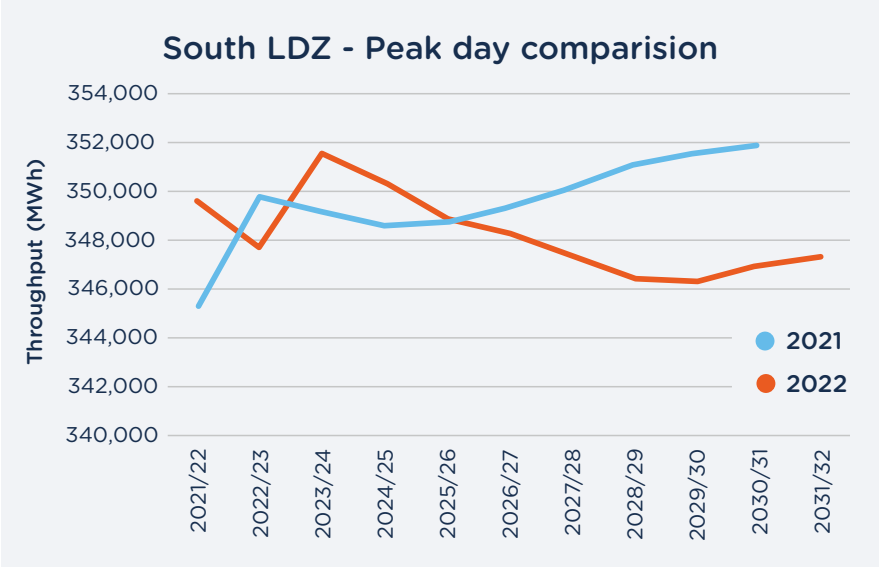


Figure 13: South LDZ Peak day comparison

South LDZ

South generally has lower peaks than last year, due to lower annual demand and embedded generation. Specifically, there was an increase in the starting point due to reconciliation of historic demand – this has been more than offset by lower annuals in all NDM sectors, most notably non domestic sectors. Lower embedded generation in the queue has contributed 1.3% reduction to the peak. This is the highest impact for this element for all LDZs. Overall, the 2030/31 peak is 1.6% lower than last year. Increase from 2022/23 to 2023/24 is due to increases in embedded generation alongside commercial and industrial demand (DM and NDM) rebounding from reductions in 2022/23.

Appendix A

Demand forecast tables

Annual demand forecast by load category – SGN overall											
Calendar year	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
0 - 73.2 MWh	92.6	84.9	84.4	84.6	86.3	86.8	87.3	87.9	88.7	89.2	89.4
73.2 - 732 MWh	12.9	11.9	12.3	12.3	12.3	12.4	12.3	12.3	12.3	12.3	12.3
732 – 2,196 MWh	5.9	5.5	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
2,196 – 5,860 MWh	3.5	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Total small user	114.9	105.6	105.4	105.5	107.2	107.9	108.3	108.9	109.6	110.1	110.3
>5,860 MWh	7.7	7.2	7.0	7.0	7.0	7.1	7.0	7.0	7.0	7.0	7.0
DM consumption	22.1	23.2	26.7	26.5	26.3	26.3	26.3	26.4	26.4	26.5	26.7
Total large user	29.8	30.3	33.8	33.6	33.4	33.3	33.3	33.4	33.4	33.5	33.7
Total LDZ	144.7	136.0	139.1	139.1	140.6	141.2	141.7	142.3	143.0	143.6	144.0
Shrinkage	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Total throughput	145.3	136.6	139.8	139.8	141.2	141.9	142.3	142.9	143.7	144.3	144.6

Gas supply year	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**
Total throughput	138.8	139.0	139.8	140.9	141.7	142.2	142.8	143.5	144.1	144.5	144.9

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

Annual demand forecast by load category – Scotland LDZ											
Calendar year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
0 - 73.2 MWh	30.6	27.5	27.3	27.0	27.6	27.7	27.8	28.0	28.2	28.3	28.3
73.2 - 732 MWh	4.3	4.1	4.1	4.0	4.0	4.0	3.9	3.9	3.8	3.8	3.8
732 – 2,196 MWh	2.4	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4
2,196 – 5,860 MWh	1.6	1.5	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6
Total small user	38.9	35.2	35.0	34.7	35.2	35.4	35.5	35.7	35.8	36.0	36.0
>5,860 MWh	3.3	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.2	3.2	3.2
DM consumption	7.7	7.7	8.4	8.3	8.1	8.1	8.1	8.1	8.2	8.2	8.3
Total large user	11.0	10.8	11.4	11.3	11.2	11.2	11.2	11.3	11.3	11.4	11.5
Total LDZ	49.9	46.0	46.4	46.0	46.4	46.6	46.7	46.9	47.2	47.4	47.5
Shrinkage	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total throughput	50.1	46.1	46.5	46.1	46.6	46.8	46.9	47.1	47.4	47.6	47.7

Gas supply year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Total throughput	47.1	46.4	46.2	46.5	46.7	46.9	47.1	47.3	47.5	47.6	47.8

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

Annual demand forecast by load category – South East LDZ											
Calendar year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
0 - 73.2 MWh	37.4	34.7	34.6	35.1	35.8	36.0	36.3	36.5	36.9	37.2	37.3
73.2 - 732 MWh	4.9	4.6	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
732 – 2,196 MWh	1.9	1.8	1.7	1.7	1.7	1.8	1.7	1.7	1.7	1.7	1.7
2,196 – 5,860 MWh	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total small user	45.3	42.0	41.9	42.4	43.2	43.5	43.7	44.0	44.3	44.6	44.8
>5,860 MWh	2.2	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
DM consumption	7.5	7.4	7.8	7.7	7.6	7.5	7.5	7.5	7.5	7.5	7.5
Total large user	9.6	9.4	9.7	9.6	9.5	9.5	9.5	9.5	9.5	9.4	9.5
Total LDZ	54.9	51.4	51.7	52.1	52.7	53.0	53.2	53.5	53.8	54.1	54.3
Shrinkage	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total throughput	55.2	51.7	51.9	52.4	53.0	53.3	53.5	53.8	54.1	54.3	54.6

Gas supply year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Total throughput	52.6	51.9	52.2	52.8	53.2	53.4	53.7	54.0	54.3	54.5	54.7

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

Annual demand forecast by load category – South LDZ											
Calendar year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
0 - 73.2 MWh	24.7	22.7	22.6	22.5	23.0	23.1	23.3	23.4	23.6	23.7	23.8
73.2 - 732 MWh	3.6	3.3	3.5	3.6	3.6	3.7	3.7	3.7	3.7	3.7	3.8
732 – 2,196 MWh	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.3	1.3	1.3
2,196 – 5,860 MWh	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7
Total small user	30.7	28.4	28.4	28.4	28.8	29.0	29.1	29.2	29.4	29.5	29.5
>5,860 MWh	2.2	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8
DM consumption	6.9	8.1	10.6	10.6	10.6	10.7	10.7	10.8	10.8	10.9	10.9
Total large user	9.1	10.2	12.7	12.7	12.6	12.6	12.6	12.6	12.7	12.7	12.7
Total LDZ	39.8	38.6	41.1	41.1	41.5	41.6	41.7	41.9	42.0	42.2	42.2
Shrinkage	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total throughput	40.0	38.8	41.3	41.3	41.7	41.8	41.9	42.1	42.2	42.4	42.4

Gas supply year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Total throughput	39.1	40.7	41.3	41.6	41.8	41.9	42.0	42.2	42.3	42.4	42.4

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

1 in 20 peak day firm demand forecast – at a glance											
Calendar year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Scotland	345.1	340.2	343.8	342.3	340.7	339.4	338.4	336.2	334.5	335.4	335.8
South East	459.7	451.7	453.1	451.5	450.3	448.8	449.4	450.5	451.9	452.6	454.8
South	349.6	347.8	351.5	350.4	348.9	348.3	347.4	346.4	346.3	347.0	347.3
SGN overall	1,154.4	1,139.6	1,148.4	1,144.2	1,139.9	1,136.4	1,135.1	1,133.1	1,132.7	1,135.0	1,137.9

Table 7: 1 in 20 Peak day firm demand forecast - At a glance (GWh)

1 in 20 peak day firm demand forecast – SGN overall by load categories											
Calendar year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
0 - 73.2 MWh	822.5	818.8	815.2	812.1	809.0	804.9	804.2	802.4	802.0	804.1	805.3
73.2 - 732 MWh	107.5	99.7	103.1	103.0	102.9	103.7	103.5	103.4	103.3	103.2	103.1
732 – 2,196 MWh	36.7	34.3	33.6	33.6	33.5	33.6	33.4	33.3	33.2	33.2	33.1
2,196 – 5,860 MWh	21.7	20.3	19.9	19.9	19.9	19.9	19.9	19.8	19.8	19.8	19.7
>5,860 MWh	47.7	44.6	43.8	43.7	43.6	43.6	43.5	43.3	43.2	43.1	43.0
Total NDM consumption	1,036.0	1,017.7	1,015.7	1,012.2	1,008.8	1,005.8	1,004.4	1,002.2	1,001.4	1,003.3	1,004.3
DM firm consumption	116.5	120.2	130.9	130.1	129.3	128.8	128.9	129.2	129.5	129.9	131.8
Total firm consumption	1,152.5	1,137.8	1,146.6	1,142.4	1,138.1	1,134.6	1,133.3	1,131.3	1,130.9	1,133.2	1,136.1
Total shrinkage	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Total LDZ	1,154.4	1,139.6	1,148.4	1,144.2	1,139.9	1,136.4	1,135.1	1,133.1	1,132.7	1,135.0	1,137.9

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

1 in 20 peak day firm demand forecast – Scotland LDZ by load categories											
Calendar year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
0 - 73.2 MWh	236.0	235.0	234.3	233.4	232.4	231.2	230.3	227.9	226.0	226.6	226.5
73.2 - 732 MWh	32.7	30.5	30.8	30.3	29.8	29.8	29.5	29.2	28.9	28.6	28.3
732 – 2,196 MWh	13.2	12.1	12.0	12.1	12.2	12.4	12.5	12.6	12.7	12.8	13.0
2,196 – 5,860 MWh	8.7	8.0	8.0	8.0	8.1	8.2	8.3	8.3	8.4	8.5	8.6
>5,860 MWh	18.1	16.7	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.8
Total NDM consumption	308.7	302.4	301.6	300.5	299.3	298.6	297.6	295.3	293.4	294.1	294.2
DM firm consumption	35.9	37.3	41.7	41.3	40.9	40.3	40.3	40.4	40.6	40.8	41.1
Total firm consumption	344.6	339.7	343.3	341.8	340.2	338.9	337.9	335.7	334.0	334.9	335.3
Total shrinkage	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total LDZ	345.1	340.2	343.8	342.3	340.7	339.4	338.4	336.2	334.5	335.4	335.8

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

1 in 20 peak day firm demand forecast – South East LDZ by load categories											
Calendar year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
0 - 73.2 MWh	340.0	337.9	336.0	334.6	333.7	331.7	332.5	333.8	335.3	336.1	336.9
73.2 - 732 MWh	43.1	39.8	40.9	40.9	41.0	41.4	41.3	41.3	41.3	41.4	41.4
732 – 2,196 MWh	12.0	11.0	10.7	10.8	10.9	10.9	10.9	10.9	10.9	10.9	10.9
2,196 – 5,860 MWh	6.7	6.2	6.0	6.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1
>5,860 MWh	13.6	12.5	12.1	12.2	12.3	12.4	12.4	12.4	12.4	12.4	12.4
Total NDM consumption	415.4	407.3	405.6	404.6	404.0	402.5	403.3	404.5	406.0	406.8	407.7
DM firm consumption	43.5	43.6	46.7	46.1	45.6	45.5	45.3	45.2	45.1	45.0	46.3
Total firm consumption	458.9	450.9	452.3	450.7	449.5	448.0	448.6	449.7	451.1	451.9	454.0
Total shrinkage	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total LDZ	459.7	451.7	453.1	451.5	450.3	448.8	449.4	450.5	451.9	452.6	454.8

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

1 in 20 peak day firm demand forecast – South LDZ by load categories											
Calendar year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
0 - 73.2 MWh	246.5	245.9	245.0	244.0	242.9	242.1	241.4	240.6	240.7	241.5	241.9
73.2 - 732 MWh	31.8	29.4	31.5	31.8	32.1	32.6	32.7	32.9	33.1	33.3	33.5
732 – 2,196 MWh	11.5	11.2	10.9	10.7	10.4	10.3	10.0	9.8	9.6	9.4	9.2
2,196 – 5,860 MWh	6.3	6.1	6.0	5.8	5.7	5.6	5.5	5.4	5.3	5.1	5.0
>5,860 MWh	15.9	15.5	15.1	14.8	14.5	14.2	13.9	13.6	13.3	13.1	12.8
Total NDM consumption	311.9	308.0	308.4	307.1	305.6	304.7	303.5	302.3	302.0	302.4	302.4
DM firm consumption	37.2	39.2	42.5	42.7	42.8	43.1	43.3	43.5	43.8	44.0	44.3
Total firm consumption	349.0	347.2	351.0	349.8	348.4	347.7	346.8	345.9	345.7	346.4	346.7
Total shrinkage	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total LDZ	349.6	347.8	351.5	350.4	348.9	348.3	347.4	346.4	346.3	347.0	347.3

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

Appendix B

2021 flows and supporting information

This appendix describes annual flows during the 2021 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 2021 weather corrected annual demands and forecasts are based on the industry's current view and research in co-operation 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 2021 calendar year with the forecasts presented in our 2021 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 2021 (TWh) - Scotland LDZ			
	Actual demand	Weather corrected demand	2021 LTDS forecast demand
0 - 73.2MWh	29.4	29.2	28.9
73 – 5,860MWh	8.0	7.9	8.6
>5,860MWh firm	10.9	10.9	11.2
Total LDZs	50.2	49.9	48.6
Shrinkage	0.2	0.2	0.2
Total throughput	50.4	50.1	48.8

Table 12: Annual demand for 2021 (TWh) – Scotland LDZ

Annual demand for 2021 (TWh) - South East LDZ			
	Actual demand	Weather corrected demand	2021 LTDS forecast demand
0 - 73.2MWh	38.6	36.9	36.4
73 – 5,860MWh	8.2	7.8	8.3
>5,860MWh firm	9.8	9.6	9.1
Total LDZs	57.1	54.9	53.8
Shrinkage	0.3	0.3	0.3
Total throughput	57.4	55.2	54.1

Table 13: Annual demand for 2021 (TWh) – South East LDZ

Annual demand for 2021 (TWh) - South LDZ			
	Actual demand	Weather corrected demand	2021 LTDS forecast demand
0 - 73.2MWh	24.9	24.1	23.8
73 – 5,860MWh	6.1	5.9	6.4
>5,860MWh firm	9.2	9.1	10.2
Total LDZs	41.0	39.0	40.4
Shrinkage	0.2	0.2	0.2
Total throughput	41.1	40.0	40.6

Table 14: Annual demand for 2021 (TWh) – South LDZ

LDZ winter severity statistics

Sourced from the April 2022 National Grid Winter Severity Report 2021/22, these statistics cover the gas industry interpretation of winter lasting from October 2021 to March 2022 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. The most severe cold winter is the one that has happened once in the last 62 years. This would be a 1 in 62 cold winter and this occurred in 1962/63.

UK-wide, the winter of 2021/22 was the third warmest peak winter day compared to the last 62 years.

1 in 'X' winter severities per LDZ	
LDZ	1 in 'X'
Scotland	33_warm
South East	10_warm
South	16_warm
National	20_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 2021 and September 2022 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 2021-22.

Actual demand on the maximum and minimum demand day of gas year 2021/22		
LDZ	Maximum day 2021/22	Minimum day 2021/22
Scotland	21.41 mscmd (07/12/2022)	4.03 mscmd (17/07/2022)
South East	29.05 mscmd (29/11/2022)	4.59 mscmd (16/06/2022)
South	20.32 mscmd (21/01/2022)	2.81 mscmd (17/07/2022)

Table 16: Actual demand on the maximum and minimum demand day of gas year 2021/22

Maximum and minimum demand of gas year 2021/22 (as a percentage)			
LDZ	Forecast peak day	Actual maximum peak day	Actual minimum peak day
Scotland	31.49 mscmd	68.0 %	12.8 %
South East	42.62 mscmd	68.2 %	10.8 %
South	32.41 mscmd	63.2 %	8.8 %

Table 17: Maximum and minimum demands of gas year 2021/22 (as a percentage)

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 12,000 kWh.

These figures do not include sites which currently have suspended Letters of Direction.

Portfolio of biomethane sites		
LDZ	Total	Equivalent no of domestic customers
Scotland	19	128,871
Southern	16	130,084
Total	35	258,955

Table 18: Portfolio of sites as of end August 2022

<7bar distribution projects

Tables 19 to 25 detail the <7bar projects which relate to the planning horizon discussed with this year's LTDS.

When scheduling our major reinforcement projects, we consult with local authorities and developers. This may result in a planned build year change compared with the last year LTDS.

Major projects are works estimated to cost in excess of £500,000.

Alternatives to reinforcement

For each project under consideration, interruption has been investigated as a possible alternative to reinforcement. However, due to the size of the developments driving them and the scale of the projects, the level of interruption required to negate the need for reinforcement would be substantial and therefore is not a viable option.

Another alternative looked at was the possibility of increasing operating pressures in the affected areas. However, again, due to the size and localised nature of the reinforcements, raising pressures would not negate the reinforcement requirement.

Low probability projects

Following a review the below listed projects have been identified as having a low probability of progressing:

<7 Bar major projects with low probability (all LDZ's)		
Project	Build year	Project scope
Hilton Drive, Aberdeen	2022/23	1.72km x 355mmHDPE
Old London Road, Hythe	2023/24	1.7km x 355mm PE MP
Newton Tony DPG	2022/25	Replace DPG
Aldermaston (Phase 1)	2022/23	2.4km x 180mmPE MP
Phase 3 A422 Brackley	2022/23	2.05km x 315mmPE MP
Folkestone DPG	2021/22	Replace DPG
Hazel Grove Road, Haywards Heath	2024/25	0.9km x 250mm PE MP

Table 19: <7bar low probability projects

Projects under construction

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

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

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

Table 21: <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 22: <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
Haddington – Dunbar IP	2023/24	1.63km x 315mm HDPE IP OR installation of DPG (dependant on acquiring land)
South East Wedge, Edinburgh	2024/25	2.91km x 18" ST IP, 2 x new DPGS, 1.28km x 630mm PE MP
Tranent IP – Phase 2	2024/25	2.4km x 315 HDPE IP
Aberlady - Gullane (Phase 1)	2025/26	2.6km x 315/355mm PE MP
Perth Bridge DPG Outlet	2025/26	2.7km x 400mm PE MP

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

<7 Bar major projects under consideration in South LDZ		
Project	Build year	Project scope
Newbury IP	2024/25	3.4km x 12" ST IP

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

<7 Bar major projects under consideration in South East LDZ		
Project	Build year	Project scope
Cliffsend CGS	2023/24	CGS Replacement
Hawe Lane, Canterbury	2023/24	1.6km x 180mm PE MP
Rocks Road, Uckfield	2024/25	0.7km x 355mm PE MP
Collier Street, Maidstone	2024/25	2km x 180mm PE MP

Table 25: <7 bar major projects under consideration in South East LDZ

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.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 (ENA) 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.

BEIS - Department for Business Energy & Industrial Strategy
BEIS 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, ie relative to atmospheric pressure. One-millibar (mbar) equals 0.001 bar.

BEIS – Government Department for Business, Energy & Industrial Strategy. BEIS replaced the Department for Business, Innovation and Skills (BIS) and the Department of Energy and Climate Change (DECC) in July 2016.

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).

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.

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

Future Energy Scenarios (FES) - National Grid's 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 Unaccounted for Gas

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.

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. More information is available on the Real Time Network pages of our website. www.sgn.co.uk/real-time-networks

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

This document is produced for the purpose of and in accordance with Scotland Gas Network plc's and Southern Gas Networks plc's, collectively known as SGN, obligations.

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:
co-bealarmed.co.uk

Before you dig contact:
linesearchbeforeudig.co.uk

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