SGN

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Long Term Development Statement 2020

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Foreword

Welcome to our Long Term Development Statement (LTDS) for 2020

Our LTDS allows us to present to our customers and wider stakeholders the outputs from our annual forecasting process.

This year has certainly been a very challenging year for us all and our thoughts go out to everyone who has struggled throughout the global pandemic, especially those who have lost family, friends and loved ones as a result of COVID-19.

When producing our forecasts we look at many factors which might influence gas demand over a 10-year planning horizon. Factors which influence our analysis include trends in customer behaviour, the strength of the economy, both nationally and regionally, as well as legislation which may drive customer behaviour such as the UK Government's proposals to restrict carbon based energy in new homes from 2025.

Our forecast does not include unknowns such as legislation yet to be made law, although this, along with the potential impact of new innovations such as hybrid heating systems and the use of hydrogen as a replacement for Natural Gas, is appraised during the analysis.

The results of our forecast are likely to be more accurate if the inputs are settled and consistent over a long period of time and the UK energy industry has benefitted from a relatively stable set of inputs for a number of years. COVID-19 however has brought a new set of challenges to the production of our forecast this year, not only because our team is working remotely, but because a number of the inputs we've used in the past are changing as a result of the pandemic. In fact, an increase in remote working itself is a cause of changing demand across the UK's energy networks.

These changes prove past behavioural trends are not necessarily a good benchmark of what may happen in the future. So please keep in mind as you read our 2020 LTDS, the figures we present this year may look very different once we review the performance of our forecasts in 2021.

Another change you'll see this year is, unlike in the past where we've tried to show how our forecasts measure up against external scenario analysis, such as National Grid's Future Energy Scenarios, we'll be publishing later this year a separate document which allows our audience to understand this important aspect of our analysis in better detail.

I do hope you'll find this publication useful and informative. Stay safe and well and if you have any questions or feedback on our LTDS or any aspect of our forecasting process please get in touch with 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 and NGG UKT meet 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 Appendix C.

Reviewing our forecasts

We continually review our forecasting process to ensure it delivers the best possible outcome for our customers and the management of our networks.

In 2019 we engaged a new forecasting partner for RIIO-GD2. This allowed us to introduce new methods of demand modelling including being able to look at a greater number of customers from a bottom-up perspective, with a more granular assessment of specific types and groups of customers.

Managing reductions in heat from our homes is a key part of the UK being able to reach our net-zero targets, and improving our understanding of domestic demand is vital to understanding the impact carbon reductions will have on the management of our networks on the way to net-zero.

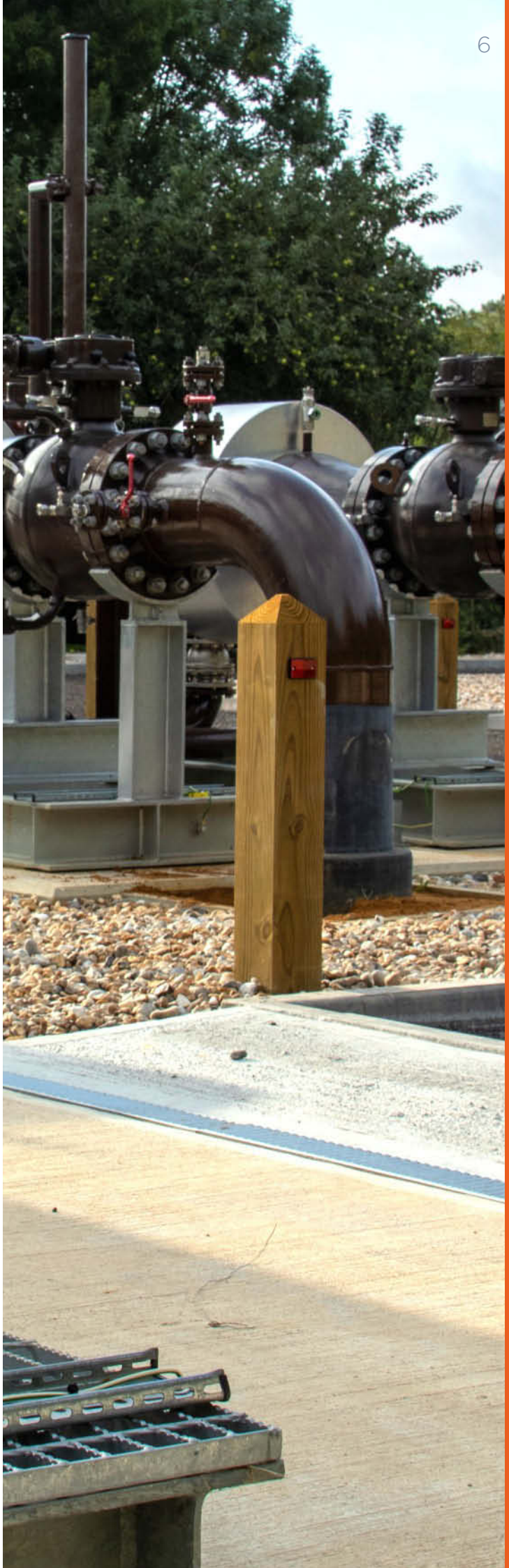
Approximately two-thirds of our overall gas demand is from domestic customers. Any changes in domestic demand brought about by customer behaviour and energy efficiencies in the home has a large impact on our forecast.

The second group of customers having an important impact on system management are our large Daily Metered (DM) customers, as their non-standard patterns of gas usage increase the challenges when managing supply and demand.

This year we've been able to include more detailed analysis of the specific patterns of use from a greater number of our DM customers. The result is we have a better view than before of how they're taking gas throughout the year and, as a result, their impact on supply and demand.

As we look to further improve the inputs within our analysis, we'll require a greater number of those customers who use gas in a non-standard pattern, such as embedded power stations, to be daily metered. This is key to a better understanding of demand and supply requirements and managing our networks on behalf of our customers, especially as the UK moves towards net-zero.

The more granular approach to modelling has resulted in an improved overall understanding of our customers' gas usage. This has informed our forecast showing us how demand is likely to change in the future and thereby improving our understanding of supply and demand requirements within our peak and annual demand forecasts.



COVID-19

The global pandemic occurred late in the process of developing our 2020 forecasts. Ordinarily, with such an unprecedented event we wouldn't usually accommodate the effect within our analysis at this late stage. However, it was clear the UK's economy was going to suffer to some extent as a result of the pandemic, and if the analysis proved it was reasonable to do so, it would be beneficial to have some form of understanding of what this might be.

To do this, we looked at a number of potential levels of economic reductions. When assessing these we knew we couldn't accurately predict the full impact of the global pandemic. Especially as this work was done as the pandemic increased in severity and many of our conclusions were changing daily.

It was clear however, COVID-19 was going to change things, therefore we decided to include a reduction to the econometric input of the analysis where possible to do so.

This was eventually included in two ways. First, with a short-term impact for the 2020/21 planning year and second, with a longer-term impact for the remaining period of our forecast.

The short-term impact for the 2020/21 planning year is based on analysis we did on the limited data available on the immediate impacts of gas demand from the first few weeks of lockdown.

The long-term affects COVID-19 has had on our forecasts may be summarised as:

(i) Demand in the domestic sectors is slightly lower for the whole forecast. This is due to the pandemic's impact on general prosperity affecting domestic behaviour, leading to households heating their homes to slightly lower temperatures compared with a forecast without COVID-19.

(ii) Demand in non-domestic sectors is reducing during 2020 due to reduced economic activity with a recovery for the remainder of the forecast starting late 2021.

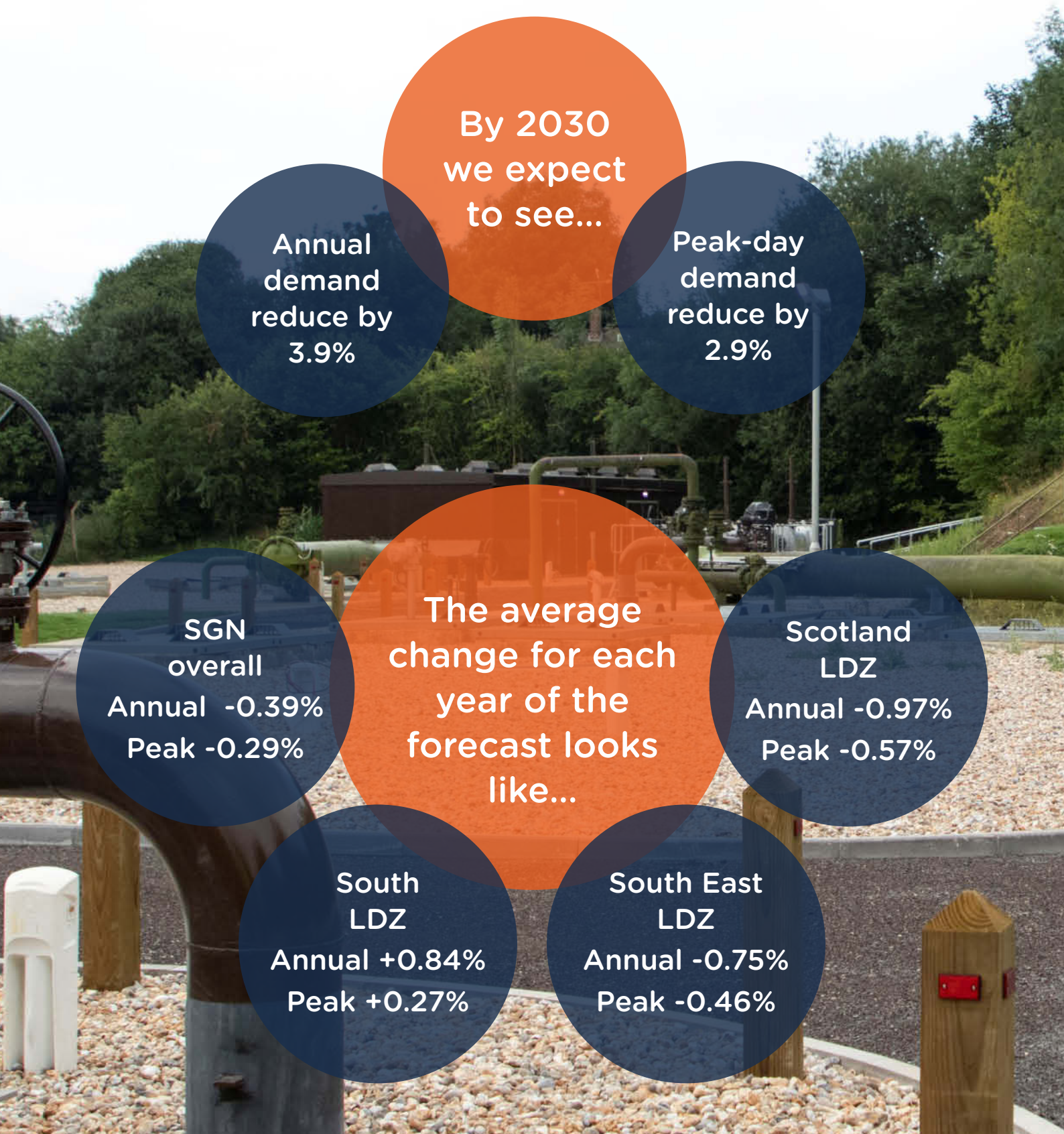
(iii) The reductions in gas demand for most non-domestic sectors eventually reverse to pre COVID-19 forecast levels at varying points within the planning period.

This has been an extremely challenging planning period to forecast. COVID-19 has massively impacted everyone's lives so far in 2020 and its affect on gas demand is likely to be seen for years to come. Some areas may never see demand return to pre COVID-19 patterns and when we look back at our 2020 forecast next year, we're not expecting this year's view of annual and peak demand, for the next 10 years, to look the same.

The next 10 years

Our forecast covers a 10 year planning horizon. It's the result of a detailed assessment of current government legislation, historic and projected economic trends as well as customer behaviour.

The outputs from the 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.



The main factors which influenced our 2020 forecasts are...

Detailed assessment of Daily Metered (DM) customer past behaviour and projections of changes in demand including discussions with the largest users

Increasing fuel prices in-line with BEIS forecasts

Improvements to energy efficiency of new and existing housing stock based on current government policy and including any firm indications of changes to policy

Long term economic impact of COVID-19 on domestic heating behaviour and commercial and manufacturing outputs

Increasing customer awareness of their impact on the environment and subsequent changes in behaviour

Growth in embedded power stations connected to our networks, increasingly being used as back-up for when renewable energy sources are unavailable

Number of customers as of 2020

5.9m

Our domestic customers account for some two thirds of overall gas demand and while our forecasts show customer numbers may continue to grow, improvements to the thermal efficiency of our homes and boilers should result in a net reduction in gas demand.

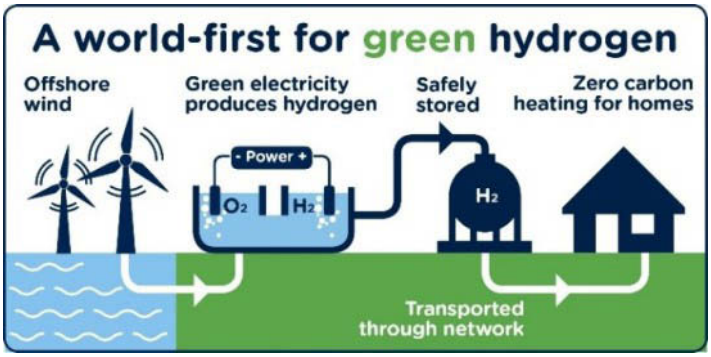
However, actual customer numbers will be dependent on how the UK meets its 2050 (2045 in Scotland) carbon reduction obligations.

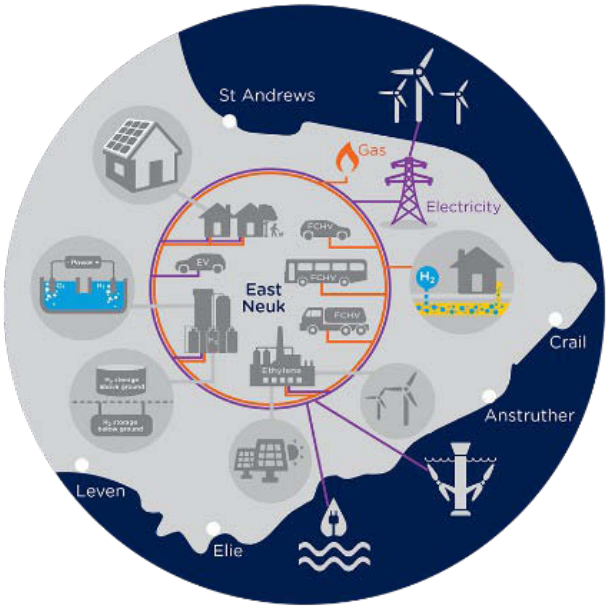
We will continue to look after our networks safely and efficiently within the current regulatory framework. This will ensure we maintain security of supply, while ensuring maximum value from our investments on behalf of our current and future customers.

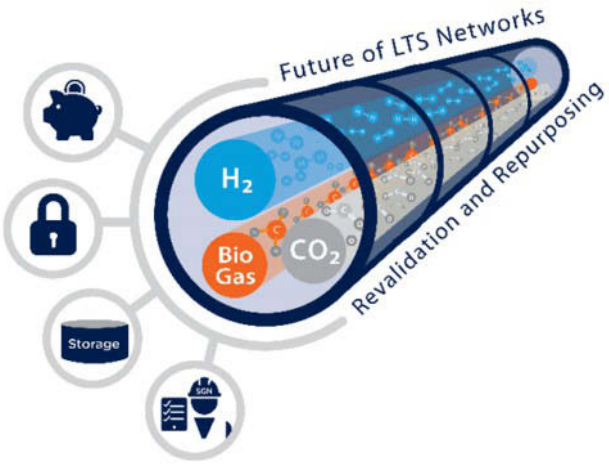
The UK's energy industry is transitioning towards a net-zero carbon future in which our stakeholders tell us we should play a major part delivering

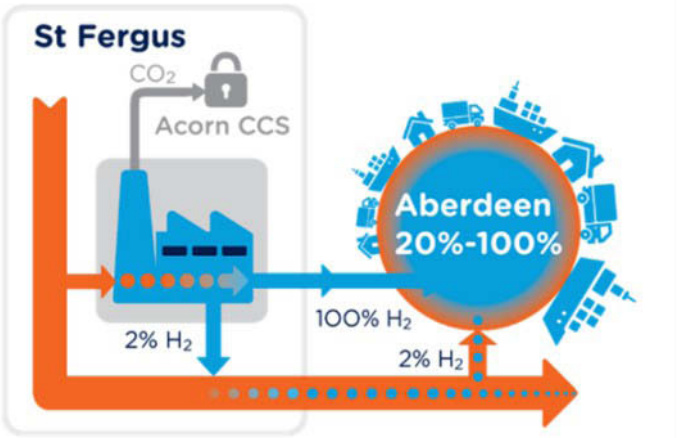
We're working hard to deliver net-zero carbon networks on behalf of our customers, through investing in innovative solutions to enable us to transport low carbon sources of energy.

These projects include:









Clicking on the images will to take you to our website where you can find out more about these projects or you can visit our website at www.sgn.co.uk

Embedded power stations

The UK Government has incentivised new forms of electrical generation through the Capacity Mechanism to back up electricity supplies at times of low availability of renewables.

A considerable amount of this embeded generation is gas fired, being a low-cost established technology which is lower in carbon than many alternatives.

Our analysis has shown an increasing need for flexibility within the electricity networks will result in the number of embedded power stations continuing to grow considerably.

The result is growth in annual demand for this sector reduces, while peak demand and system flexibility requirements to support it increase.

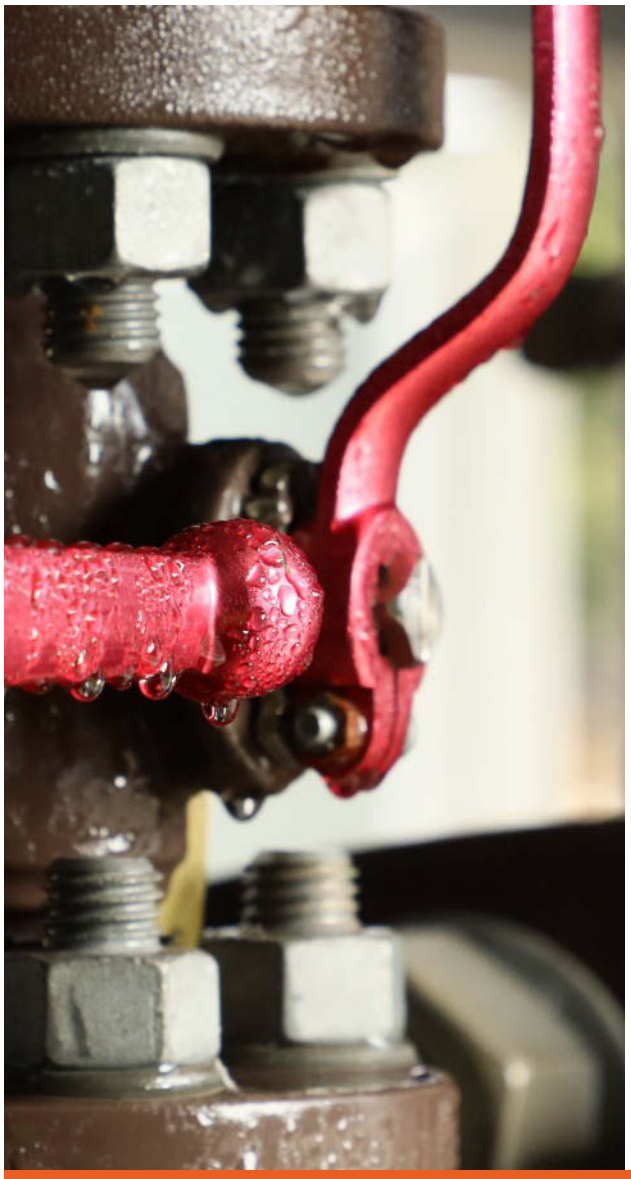
This is one of many ways the gas networks are helping decarbonise the UK's energy supplies.

As the amount of renewable generation increases the embedded gas fired generators' operation times becomes increasingly variable. This creates a real challenge for the gas networks when it comes to managing supply and demand.

Energy efficiency

We've made considerable improvements in our modelling of energy efficiency within this year's forecast.

This has been achieved through identifying how domestic energy efficiency for our customers' gas boilers, thermal insulation and controls, has improved over the last 10 years.



By modelling changes in comfort levels i.e. how warm someone heats their home, we've been able to identify how much changes in gas demands are due to energy efficiency and how much are due to customers' behaviour.

The ability to see how each factor has changed gas demand over the last 10 years, has given us greater confidence in forecasting how these factors will change over the next 10 years.

This has improved the underlying domestic gas demand element of our forecast, which accounts for almost two thirds of our total gas demand.

Improvements in gas boiler efficiency is the single largest factor impacting changes over the next ten years accounting for the majority of the domestic gas demand reductions within our forecast.

Smart metering

We've been monitoring the impact of smart meters on gas demand for several years.

This year, there's been increased availability of data from third party studies of the impact on demand from smart metering and smart controls. We've been able to incorporate some of this work within our analysis to better understand the impact it has on gas demand.

Field trials show whilst smart meters have many benefits, especially in a connected home, their overall impact on gas demand is relatively low although it is much greater with electricity demand.

Smart controls

This is technology other than Smart meters, such as WIFI and App connected thermostats. This technology is often considered along with Smart meters.

In this year's forecast, we looked at their impact and found while they may have a greater impact than Smart meters, the impact is often lower than expectations due to users not installing all the elements required to maximise the benefits.

Hydrogen

We've not made any provision for hydrogen as an alternative to natural gas within our forecast as the technology is still at too early a stage to determine how it may impact on demand.

However, it's recognised hydrogen is likely to form a key part of achieving net-zero both within the UK and for our energy partners in the European Union.

We cover some of the work we're doing investigating how hydrogen can help us achieve net-zero elsewhere in this document.

However, for hydrogen to develop further within the energy industry, our customers and stakeholders will require a clear pathway mapped out by the UK Government similar to the approach taken with transport and the introduction of electric vehicles (EVs) and the prohibition of gas in new homes.

This will enable the energy industry and business partners to make long-term plans and finance the required hydrogen revolution our customers tell us they want.

As part of its COVID 19 recovery planning the UK government has introduced funding for a number of net-zero projects including hydrogen.

Transport

The impact electrification of transport may have on our gas networks in the next 10 years has been calculated as relatively small. However, this is dependent on several issues including how large vehicles decarbonise, customer choice and government policy.

We see electrification of transport being most prevalent in smaller vehicles such as cars and vans. The impact this has on gas demand has been factored into our 10 year forecasts.

The introduction of electric vehicles (EVs) has a secondary impact largely affecting electricity demand and how much gas is used to generate the electricity.

In early 2020 there were around 300,000 plug in EVs in the UK. These are projected to increase up to 11 million by 2030.

Heat

In order to achieve UK's net-zero targets, heat in homes needs to be decarbonised. For this to happen the amount of gas used directly for heating must significantly reduce or be completely replaced with another solution.

District heating networks may form part of the solution too.

Our analysis shows we'll achieve this by one of three routes:

(I) mainly electrification,

(ii) mainly hydrogen or;

(iii) a hybrid solution of the two

Electrification, hydrogen and heat networks could all be powered by gas, especially if Carbon Capture, Use and Storage (CCUS) is developed at scale.

Most net-zero analysis, including the scenarios which underlie the Committee on Climate Change recommendations, and National Grid's Future Energy Scenarios, show significant amounts of CCUS as fundamental.

The upgrades all gas distribution networks are currently undertaking will enable us to supply hydrogen either as a blend with natural gas or as a pure gas.

Considerable work is also taking place in government and throughout the wider energy industry to facilitate the requirements to decarbonise heat, and we're working both within our organisation and with our energy industry partners to enable this.

Natural gas is seen as an important transitional fuel helping the pathway towards net-zero, especially in a hybrid system.

Currently these factors don't form fundamental parts of our 10 year forecast as they're considered unlikely to happen at scale until 2030 onwards. Consequently the current market and policies required for them to develop at scale are not yet in place. This position will however remain under ongoing review.

Renewables

There are a number of renewable technologies which can influence our forecasts. These are wind, solar, heat pumps (both air and ground source), thermal store and biomass.

Our analysis concluded the impact these have had on gas demand to-date has been very low. Even initiatives such as the renewable heat incentive have had little impact on the uptake of these technologies compared with gas heating.

As a result, the impact of renewable technologies on our forecast under current government policies and incentives is low. But this will be under constant review as the Government introduces further measures to enable net-zero.

This year we commissioned independent analysis to assess the impact these have had over the last 10 years and the potential impact they could have over the coming 10 year forecast period.

Housing

There's already been a number of initiatives over the years to reduce the carbon footprint of our homes. As a result, gas demand from new build homes is less than half the demand from an average house within existing stock.

Current efficiency levels along with the relatively small growth in new homes compared to existing stock, results in new build housing having a relatively minor impact on future gas demand.

We've considered the Government's Future Homes standard in our forecast. Our forecasts of increasing energy efficiency for new houses broadly align with its proposals, but considering it's still at a consultation stage, we've not included its full impact.

This is mainly due to significantly better standards of thermal efficiency.

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'd like to discuss our forecasting process further or feel we've not covered everything in our analysis. See contact details on page 48.

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 out 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 10-year forecast of annual and peak-day demands, which we use in the management of our gas networks.

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

Forecasting process

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

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

Validating our 1:20 peak-day

There have been relatively few periods of weather conditions approaching peak-day demand in recent history.

A 60-year weather dataset has been used to establish 1 in 20 peak weather conditions with the last 20 years used to establish potential peak demand condition. Adjustments have also been made for changes in annual demand.

The winters of 2010, 2011 and 2018 had periods of very low temperature in various network areas. To provide even better results, particular focus has been paid to the cold periods during these years.

The cold periods of 2018 have been used to calibrate our peak demand forecasts and this has been corroborated with the gas demand data we have for 2010 and 2011.

Peak demand has also been calibrated against our previous peak demand forecasts with favourable results and adjustments made for minor changes in annual demands between years, along with improved site intelligence for large users.

Improving our forecasting process

This 10 year forecast is specifically a forecast based on current energy markets, policies, and incentives, including changes which we know are happening, while avoiding those which 'may' happen.

We recognise, while our forecasting regime has served us and our customers extremely well, the UK's energy infrastructure needs to change to facilitate a low carbon future. For us to play our part in this transition we need to improve our understanding of how our networks sit within the overall energy mix as we all look to move towards net-zero.

To understand the implications this may have on future gas demand and whether this could impact our 10 year gas demand forecast, separate to our LTDS, we are developing a publication which examines the routes to achieving net-zero and the implications these may have on our demand forecasts.

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 (GYTS)** and other publications and consultations including NG **Future Energy Scenario process (FES)**.

Demand forecasting process

Here we show how our 2019 forecast performed and what we've done in 2020 to improve the accuracy of our 2020 forecast.

As you read this information please be aware when we talk about a particular year's forecast it relates to that year's Long Term Development Statement 10-year forecast. Also, when we refer to our networks, we will talk about Scotland and Southern although for the purpose of regulatory reporting we are uniquely required to discuss each of our local distribution networks (LDZs) individually. So you will also see 'Scotland', and for Southern, 'South East' and 'South' shown separately.

Please note also 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).

0-73MWh - domestic

Scotland LDZ – This LDZ has seen a 2.1% rise in demand between 2018/19 within this band. This is mainly due to customer behaviour change resulting in increasing comfort levels as a result of an improved economy. This increase offsets any demand reductions as a result of improved energy efficiencies from boilers and insulation. These changes echo those from 2017/18.

South East LDZ – This LDZ saw an increase of 1.1% in demand within this band in 2018/19. As with Scotland LDZ this is primarily due to increasing comfort levels from an improving economy offsetting smaller decreases from energy efficiency. It's also a continuation of the previous year's change for similar reasons.

South LDZ – This LDZ has seen an 1.9% increase in domestic gas demand. This is for similar reasons to South East although as with the other LDZs energy efficiency was slightly lower than in previous years, specifically due to the reductions in boiler replacement rates during 2019. Higher levels of job creation in the South LDZ also contributed to higher behaviour change than in South East.

73-732MWh - commercial

In the commercial sector a continuation of strong growth in commercial output combined with a reduction in gas prices, more than offset the underlying year-on-year energy efficiency reductions in this sector. The result is growth in all LDZs with higher rates in the South and South East LDZs. This corroborates our view of the sensitivity of this sector and importance to the local economy of the service sector to each LDZ. As a result the South East had the highest increase of 4.2% with the South LDZ the second highest with 2.3% with Scotland LDZ increasing by 1.9%.

>732MWh - Industrial

Scotland showed a continuation of underlying long-term trends in this sector, with a 4.1% reduction in gas demand between 2018 and 2019.

In the South East LDZ demand is heavily influenced by the two largest loads in the sector. If we exclude these, positive economic growth in the last few years has led to a small growth in gas demand in 2018/19, with an increase of 2.2%. However, overall the sector reduced by 11.9% in 2018/19. This was due to reduced demand as a result of the impact of one of these sites recovering from operational problems and a change of ownership.

The South LDZ's industrial demand is also dominated by large loads. Again demand has been heavily influenced due to an extended outage period during the summer of 2019. This resulted in a 9.6% reduction in this sector for this LDZ. If we exclude the large loads, the sector's demand was relatively unchanged from its long-term demand levels.

Changes to the forecasting process

This year our approach to demand forecasting has continued to evolve with a more granular assessment of demand.

A more granular approach means the majority of our scenarios are forecast through the individual elements which impact gas demand. We refer to this as a 'bottom-up' approach. This is in contrast to our previous more 'top-down' econometric analysis, which looked at a sector as a whole.

While the 'top-down' approach has served us well for many years, as borne out by our year-on-year analysis of its performance in relation to actual demand, our changing energy system requires more detailed analysis of demand, so we may have a clearer understanding of where the many variables now coming into play are going to impact our on our forecast.

This 'bottom-up' approach enables us to link historic demand changes and as well as introduce new factors to specific elements within the analysis. Adding these specific elements individually gives us a better understanding of the reasons for future forecast demand changes, which in turn improves our understanding and confidence in our forecast.

This is particularly relevant in the journey towards net-zero. This is because it allows us to better align our forecasts with the wider industry analysis, to see how our forecast aligns and what may need to be done to help the UK decarbonise.

Unlike any scenario based analysis, our forecast is based on current behaviour trends and government policies, whereas scenarios work backwards from a pre-determined fixed end point. Our more granular approach will enable us to draw better comparison between our forecast and scenario based analysis and therefore better gauge our forecast performance with that of the wider energy industry.

This 'bottom-up' approach has been applied to our domestic forecasts as well as our large loads, these two sectors being the largest types of demand on our networks. We've been able to incorporates a higher degree of accuracy as well as a greater number of large loads this year than previously, due to improvements in our processes and from direct discussions with our customers.

The 'bottom-up' approach covers around 71% of total annual demand and 78% of peak demand. These changes also helped us isolate specific impacts of COVID-19 within our forecast.

Inputs to forecast

The section provides a general overview of the key inputs to our forecasts. In previous years, our forecasts were primarily econometric forecasts meaning the inputs were mainly driven by economic indicators. This year, with revisions to our methodology, there's less weight on the econometrics and therefore less emphasis on the economy. However, econometrics still form an important part within all elements of our forecast. The impact of COVID- has also been assessed and forecasts of how the pandemic is likely to influence demand have been created. It's specific impact on demand is described within each of the following sections.

Domestic demand

Domestic demand contributes to around two thirds of our total demand. This year we separated the individual elements which make up domestic demand, so we could assess their impact. We looked at each element separately to see how they have changed historically and the reasons why, before including them within our 10 year forecast. This included an individual assessment of them on an LDZ basis.

Figure 1 shows those factors which we've analysed and forecast for, as contributing to domestic gas demand changes.

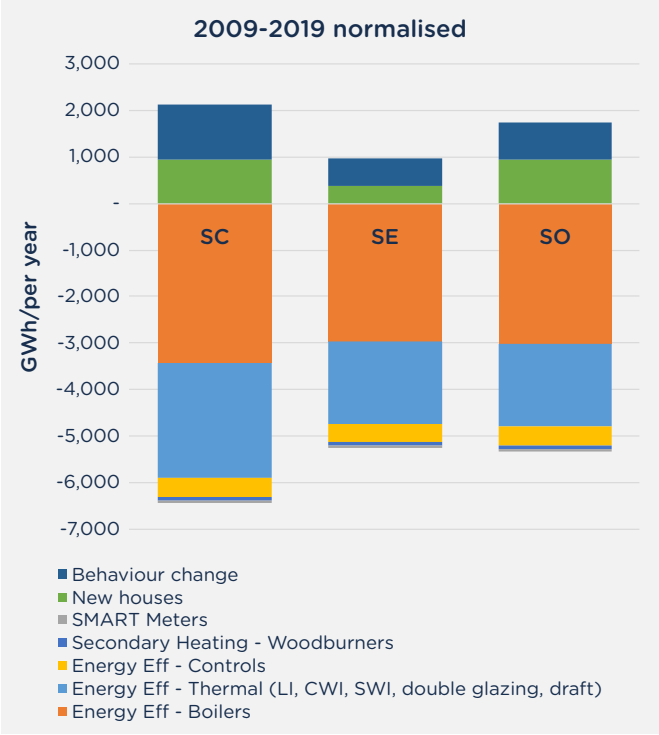


Figure 1 Domestic demand factors

Note the values for both the South East and South LDZs have been scaled to the numbers of houses in Scotland LDZ to enable a direct comparison.

While the underlying message is the same for all LDZs, there are some variations between them. The most notable is higher thermal insulation improvements in Scotland due to the way it's prioritised by the Scottish Government.

We've engaged in extensive research on these domestic elements gathering information from a number of sources including: the Department for Business, Energy & Industrial Strategy (BEIS), English and Scottish housing surveys, Ministry of Housing, Communities & Local Government (MHCLG), Heating and Hotwater Industry Council (HHIC), and the Energy and Utilities Alliance.

Energy efficiency in the home

These are measures such as loft insulation, cavity and solid wall insulation as well as double glazing. Generally insulation measures improved considerably under the Carbon Emissions Reduction Target (CERT), which ran from 2008 to the end of 2012, but since then rates of retro fitting thermal energy efficiency measures have reduced considerably under existing policies. These lower levels are reflected in our forecast.

Boilers

The Government's mandate in 2005 for all new gas boilers to be higher efficiency condensing boilers has made this the single greatest element of reduction in gas demand in the domestic sector, although there are still a high number of boilers which have not been replaced. Current replacement rates are consistently around one million boilers a year nationally, which gives us confidence over this element of our forecast. There are still considerable reductions in gas demand to be had from replacement boilers and this is reflected in our forecast as the single largest element reducing demand across all of our networks.

Controls

This refers to thermostatic radiator valves and programmers including SMART thermostats. These have had a notable but relatively small impact on demand reductions in the last decade. The same level of impact is forecast going forwards.

Secondary Heating, Wood burners

These have had a minor impact due to a relatively low number of wood burners installed in gas heated houses although it's higher in non-gas houses. The impact on gas demand is forecast to be very low.

SMART meters

Their impact on gas demand for each customer is relatively low. This has been established from customer trials. As a result, their future impact on gas demand is also forecast to be very low.

New homes

The impact of revised building standards within new housing stock is not as high as it might be. This is due to two factors; (i) the relatively low numbers being built and; (ii) the very low gas demand for each new house compared to existing stock. Over the next 10 years the impact of new houses built is forecast to be slightly lower than the last 10 years due to incremental increases in energy efficiency.

Behaviour change

Behaviour change of customers has resulted in as significant an impact on demand as the introduction of new homes standards. Since the 2008 recession, despite a number of fluctuations, there's been a general increase in prosperity overall. This has led to an average annual increase of around 1% in domestic gas demand directly related to increasing comfort levels, the temperature we heat our homes, which broadly equates to 0.1 degree C increase each year on average. However, our analysis shows this particular element is forecast to decrease by over 90% to almost no change in comfort levels. This is due to the economic impacts of COVID-19 impacting household prosperity and GDP. These reductions have been included in our forecast through our econometric inputs.

Domestic efficiency policy

Boilers

As mentioned above, the 2005 regulation required all new boilers to be condensing boilers has driven considerable reduction in domestic gas demand. In 2018 the Boiler Plus regulations[1] essentially strengthened the 2005 regulation. However, it's really mandating what's already occurring, mainly that new boilers need to be over 92% efficient. This is reflected in our forecasts.

ECO (Energy Companies Obligation)

The ECO started fairly well in 2013, installing nearly 500,000 measures that year. Since then it has reduced annually to less than 150,000 last year. ECO is not only a means for increasing retro-fitting energy efficiency measures, but it also makes up a considerable part of overall installations. It forms part of our understanding of the underlying reasons for insulation measures reducing and corroborates our intention to keep these numbers relatively low within our forecast.

Green deal

The Green deal which followed on from CERT in 2013 has not been as successful as it might have been. There have been just over 20,000 measures installed nationwide since its introduction and numbers of installations have been falling since 2015. The scheme has been effectively replaced by the Green Homes Grant announced in July 2020.

Green Homes Grant

The impact of the Green Homes Grant announced in July 2020 has not been included in these forecasts, as it was not announced at the time of the forecasting process. However, its potential impact is still thought to be relatively low on gas demand. Initial analysis indicates due to the energy efficiency improvements and number of houses and makeup of our customers, its potential would be less than 0.5% of our total gas demand.

Economic inputs

It's important to consider two things this year regarding the economic inputs to our forecasts:

- Due to our change in forecasting approach this year the economic inputs have less weighting on our forecasts than in previous years.
- The forecasts for the UK's economy became increasingly weaker as a result of COVID-19 in early 2020. As a result, we made specific changes to our forecast of gas demand for 2020/21 planning year. These were included on top of the existing impact of the pandemic over the 10 years of the plan.

GDP

Our forecasts of GDP were originally based on the Office for Budget Responsibility (OBR) central forecast announced within the Spring 2020 budget. They show a slight dip in 2020 followed by a correction to 1.8% in 2021 until rebalancing around 1.4% for the duration of the forecast. COVID-19 occurred almost immediately after this budget, so fundamental changes were made to our forecast. As this was the beginning of an unknown economic episode we made high level assumptions based on the economic commentary available at the time.

These assumptions reduced our GDP forecast to zero% growth for 2020 with a mid-term growth of around 1%. This grows steadily until overall GDP growth during the forecast period averages at 1.4% towards the end i.e. overall growth over the forecast period rebounded to pre COVID-19 levels towards the end of the forecast.

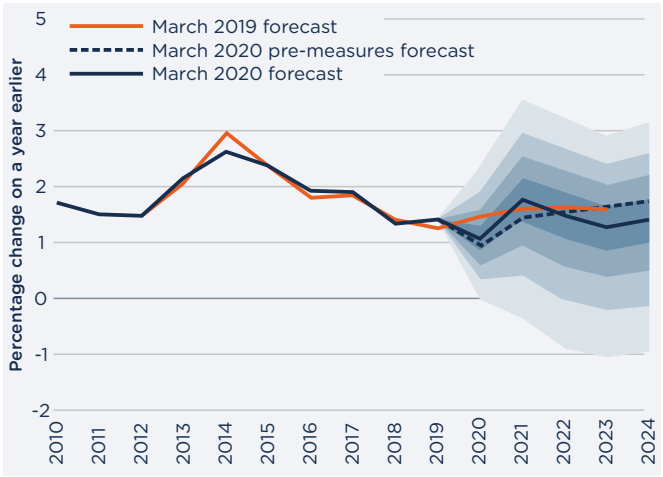


Figure 2 Source: Office for Budget Responsibility

The announcement in August 2020 of the UK officially entering recession with a 20% reduction in GDP has not been accounted for within these forecasts.

[1] uk/government/Boiler_Plus_final_policy.pdf

Inflation

Until the last couple of years inflation has been quite variable and the OBR forecasts remain that way for the next few years, averaging out at around 2.0% over the period.

The consumer price index (CPI) projections within the OBR central case is 2.0% from 2021 until 2023. Our forecast retains this level for the remainder of the period out to 2030. The CPI has relatively little impact in our econometric analysis this year as the variations in this element have less impact than other economic inputs.

Service sector output

This uses national and local indices in the forecast as this has been found to match the output best for all LDZs. Service output nationally and by region are from the UK Government's Office for National Statistics (ONS) data and show consistent and sustained growth over the year. This growth was forecast to continue however space and cost constraints in the South East LDZ meant forecast growth continued but was curtailed from the mid-point of our forecast. All LDZs were adjusted for COVID-19, taking two to four years to recover to the growth they would have seen if COVID-19 had not occurred. The South East LDZ was forecast to be worst affected by COVID-19.

Manufacturing output

Manufacturing output from ONS publications has been used for this element of econometric forecasting. There are year-on-year variations but a clear long-term trend of consistent increase which is forecast to continue. This output measure is forecast to be less impacted by COVID-19 than the services sector, due to the more consistent requirement for products than services and manufacturing changing to adapt to new requirements.

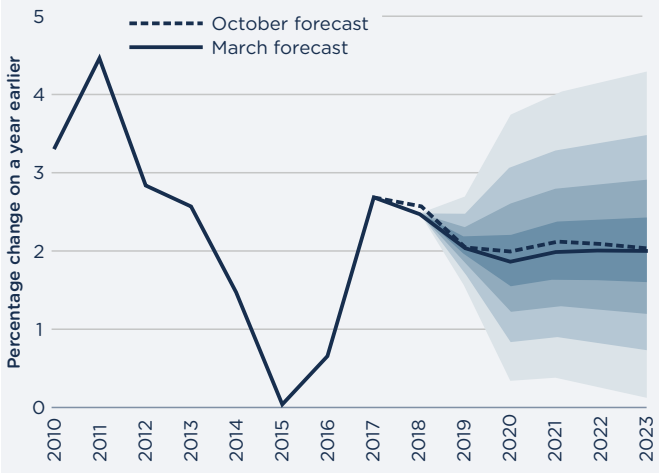


Figure 3 Source: Office for Budget Responsibility

Household disposable income

COVID-19 has had the biggest impact on this with all economic indices showing householders are forecast to have less prosperity than prior to the pandemic. As a result, a decrease in household disposable income within the forecast contributes to reductions in the behaviour change element of domestic gas demand. i.e. people no longer continuing to heat their homes a little more each year.

Jobs per region

The source of our historical data on employment types per region is from the ONS. This data shows regional variations but all LDZs have shown consistent sustained growth. However, due to COVID-19 we have included within all regions lower levels of growth in 2020 and 2021 than we did in 2019. This then recovers in 2022 with a continuation of the historical trends.

Renewable Heat Incentive (RHI)

While the RHI provides incentives that are broadly commensurate for the capital cost of renewable heating, its uptake has been relatively low.

During the last five years, 2015 to the start of 2020, the RHI has incentivised just under 60,000 renewable heating systems in domestic properties and just over 9,000 in non-domestic properties. This domestic element equates to around 0.2% of domestic properties. When you consider many of these are also non-gas properties it can be concluded the RHI has had very limited impact on gas demand. For these reasons the impact of the RHI on our demand forecasts remains low.

Regional and specific variations

Domestic energy efficiency

This has been analysed on a regional basis using the area breakdowns in BEIS publications and mapped to our LDZs through postcode mapping developed this year.

Scotland has higher levels of insulation efficiencies partially due to ECO but also because the Scottish Government considers housing as an infrastructure asset which is not the case in England. This has proportionally helped investment in more energy efficiency projects in Scotland than England especially when considering fuel poverty. We've analysed and modelled these differences at an LDZ level.

In England, specifically the South East, we've seen a reduced level of growth in demand from the building of new homes. This is due to London, the highest influencing area on demand, tending to have smaller properties than the rest of the country, including a higher proportion of flats. These properties are more often built without a gas supply for heating and/or cooking.

Embedded power

There are variations in embedded generation for each LDZ. These relate directly to the connection agreements which we have accepted within each area. Scotland has the highest amount of new generation, this is 20% higher than South and over three times the amount granted for South East. Our understanding is it's due to a combination of higher future regional requirements for flexibility being more than offset by the availability of land for generation sites. i.e. where it is most required, land is hardest to acquire, and the difficulty of land procurement is the biggest factor limiting installations.

Large loads in South and South east LDZs

DM demand dominated heavily by one large site in South LDZ and two large sites in South East LDZ.

Service sector econometrics

Our analysis suggests the South East LDZ service sector will be more affected by COVID-19 than the other LDZs, largely due to implications of dense population and expense for service sector premises in London. As a result, COVID-19 has had a slightly greater impact on gas demand for employment and outputs which are constituent parts of the econometric forecast for the SE LDZ. This is however a relatively small part of the South East LDZ's overall gas demand, accounting for 10% of total demand in 2019.

Forecast methodology

General assumptions

The starting point for production of the full set of demand forecasts is the annual seasonal normal demand. The following general assumptions were used to assist in the development of the annual forecasts:

All forecasts are seasonal normal demands calculated using the latest Seasonal Normal Composite Weather Variable (CWV).

Historic annual demand data is provided to our service provider on the same basis and daily demand data is available broken down by load band.

The historic data was corrected by our service provider using reconciliation data we provided.

SIU demand and Borders (supplied by NGN) was not incorporated into the Scotland LDZ numbers.

Shrinkage was forecast on a fixed daily basis irrespective of demand levels to be consistent with the Uniform Network Code (UNC).

It should be noted Xoserve has started providing Unaccounted for Gas data (LDUG) as part of the throughput data from June 2017. This data was examined to assess any impact on the actuals and forecasts with adjustments made as required.

Retail gas price forecasts that are used as part of the demand modelling process continue to be developed by our service provider.

Load band 0-73MWh is assumed to consist predominantly of households, therefore behaviour patterns are based on typical household demand.

Load band 73 to 732MWh is considered to be predominantly small commercial/retail premises with some small industrial. Although there are some households within this band it is assumed that the behaviour patterns will be linked to predominantly commercial/retail behaviour.

The load bands >732MWh will be predominantly industrial and commercial premises and therefore exhibit behaviour related to these types of load.

General methodology

This year the forecast methodology has changed improving our processes by moving away from a wider high level econometric analysis to

wherever possible more granular data. This granular data is used to create forecasts from a bottom up approach by counting the number of houses of different types, insulation measures installed and boiler types etc. This information is used to establish how gas demand has changed historically. We have then forecasted these elements individually adding their impacts to create a picture of gas demand which is clearer, easier to understand and more readily compared with other analysis. Where more granular data does not exist econometric analysis continues in a similar way to previous years.

The sectors where better data exists to enable the bottom up approach are; domestic, large loads and embedded power. These account for 71% of total annual demand, and 78% of total peak demand.

0 to 73.2MWh – Domestic

Houses have been split between those which existed up to 2009 and those which have been built since, referred to as existing and new houses respectively. This sector is the largest sector of demand for our networks amounting to two thirds of all demand and as a result it is the area where the demand forecast has focused most.

For both new and existing houses the impacts of energy efficiency have been assessed separately with new houses having high energy efficiency due to good fabric insulation levels and modern boilers.

Their exact impact on gas demand over the last ten year and the 10 year forecast period has been assessed by their recorded energy efficiency from published Energy Performance Certificates (EPCs) for our networks. The changes to energy efficiency in existing houses has been made through boiler installations and controls.

Once energy efficiency has been established and forecast, the remaining changes in demand is behaviour driven from changing comfort levels. This has then been removed from the sectors overall demand to establish a level of behaviour change in demand minus the energy efficiency. i.e. how domestic users have changed their comfort levels.

The behaviour change is established through econometric analysis. It's been found there's a good relationship between behaviour changes and:

- GDP
- Employment
- Household disposable income
- Domestic gas price

As with energy efficiency, these have been forecast per LDZ.

The main areas established have been:

- Retro fit insulation – Loft, cavity wall and solid wall
- Boiler sales and replacement rates
- Smart meters
- Controls - Smart thermostats and Thermostatic radiator valves (TRVs)
- Stoves/Wood burners
- Double glazing
- Draft proofing

The numbers and impacts have been established through a combination of sources, including:

- MHCLG -English housing survey
- Scottish housing surveys
- ECO
- BEIS - Smart Meter Statistics in Great Britain
- BEIS - impact assessments

How these vary between LDZ has also been established by mapping our networks to the reported geographical distribution of the measures. There are some differences between our Scotland and Southern networks due to varying priorities of the two responsible Governments and rollouts of efficiency measures.

The result of this analysis has then been brought together to produce our domestic forecast.

73.2 to 732MWh – Commercial

It's traditionally been assumed this sector is generally influenced by energy prices and economic drivers. As a result, this sector continues to be forecast through econometric analysis.

The economic fit has been assessed favourably this year to these drivers using a multivariable approach as in previous years. The econometric drivers that impact demand in this sector are:

- Service output – regional and national
- Employment – regional
- Wholesale gas price
- GDP indices, GVA
- CPI

>732MWh – Large industrial

This sector can be significantly affected by the behaviour of a small number of large loads so we have split our forecast between these large loads and the remainder of the sector.

For this year we have been able to increase considerably the amount of large loads we are able to forecast separately from 4 to over 50. This has improved the granularity and efficacy of our forecast. The increase in the number of sites included in the forecast has been enabled due to considerable site specific intelligence alongside

individual sector intelligence along with customer engagement.

Demand for the remainder of the sector is established via an econometric forecast with the drivers for this being;

- Service output – regional and national
- Industrial gas price, including impact of Climate change levy (CCL)
- GDP indices, GVA

Embedded power/New power connections/New flexible power generation

This is a relatively new type of demand driven by the increased need for flexible gas powered electricity generation to back up renewables.

The primary reasons we'd see growth in this sector would be an increase in generation of electrical energy from renewables along with an associated reduction in conventional gas and coal fired electrical generation and the need for the renewable connections to be more flexible than outgoing conventional gas and coal fired generation.

Growth is highly dependent on government incentives, particularly the Capacity Mechanism auctions, designed to ensure backup for renewable generation.

There's little precedent for forecasting these sites and limited data due to the current contracts we have with these customers. As we've said earlier, this is something we're keen to address going forward as this customer group has the potential to severely disrupt the operation of our networks due to the way they use gas.

As a result the inputs to our forecast are based on the limited data for the sites already connected and the requests for a connection which have progressed to the quote acceptance stage. We have taken this cautious approach as some of these sites attract high levels of reinforcement investment and we do not consider it acceptable to be investing in speculative requests.

The potential demand for the sites accepted is based on the annual and peak demand for the sites already taking gas, from this we have established the relationship of their usage to their booked capacity then applied this as a likely pattern of behaviour for the accepted sites.

We accept this isn't an ideal solution, however as stated a number of times throughout this publication in lieu of daily metered information for these sites, it's currently considered the only solution available to indicate potential drivers for investment requirements in the LTS and to a limited extent inform system operation.

COVID-19

The impact of COVID-19 on gas demand was assessed in two time criteria, the specific impact on 2020 and the longer term impact across the forecast period of 10 years.

The beginning of the lockdown was towards the end of our demand forecasting process which coincided with the end of the 2019/20 gas winters domestic heating season. As a result, there was very little information to base actual gas demand impacts from COVID-19.

However, there was a two week period which allowed us to understand the immediate impact of the virus. The outcome from this limited information was no discernible impact on domestic gas demand although there was up to a 15% reduction in gas demand for some non-domestic sectors.

For the first year of our forecast we took the view the immediate impact of COVID-19 on industrial and commercial gas demand was still yet to be experienced so we applied full 15% reduction for the non domestic sectors for annual gas demand for 2020.

We anticipated the majority of the short-term impact would conclude by the winter so made no specific additional change to peak demand for 2020.

Throughout the forecast period we also included econometric analysis when we established the annuals and peaks. Here we made specific adjustments to our economic inputs particularly for GDP, commercial and manufacturing outputs. These were benchmarked against economists' views at the time, which all showed a reduction due to the impact of the pandemic.

Commercial and manufacturing sectors are both impacted by reduced GDP which dips and recovers to increase above 2019 levels in 2021, but ultimately does not return to original projection of GDP until late 2020s.

Commercial sectors are also impacted by reduced forecasts of service output and these are forecast to take three years to return to pre COVID-19 growth within our projections. However, commercially the South East is not forecast to fully recover to pre COVID-19 levels.

In the service sector the South East is also forecast to be more affected by COVID-19 as it has been assumed. For example, there will not be as many people returning to their workplaces as before with fundamental changes to working practices such as extensive homeworking coming into play and associated impacts on local economies as a result.

Domestic demand is impacted by the behaviour change. i.e. comfort levels element. Over the last four years comfort levels have been increasing across all our networks due to a healthy economy, jobs and an increase in household disposable income. The economic impacts of COVID-19 have been re-run with lower economic projections. These lower projections have changed forecast comfort levels from a steady continuous increase in levels to almost no further increase in comfort levels.

Peak demand forecasting

General assumptions

The traditional primary basis for calculating the peak-day demand in any market is the relationship between average daily demand and peak-day demand, typically known as the load factor, where:

$$\text{Peak day demand} = \frac{\text{average daily demand}}{\text{load factor}}$$

The following assumptions were made when producing the 1 in 20 peak day demand:

- The modelling method results in no additional requirements for demand diversity analysis
- The use of 1 in 20 CWVs, provided by xoserve to calculate the 1 in 20 peak day meets the requirements of the licence and UNC with respect to the specified methodology for determining 1 in 20 peak day demand
- No allowance will be made in calculating the base case 1 in 20 peak day for the differences between the calculated peak demand and the SOQ booked by shippers for larger loads
- No demand reduction will be allowed associated with demand management products offered by Shippers
- No allowance will be made to take account of any capacity buy-back contracts that may have been negotiated between ourselves and our customers

LDZ specific assumptions

All general assumptions are applied across all the LDZs and there were no specific assumptions that relate to the individual LDZs that were used in this analysis, unless the weather demand analysis suggests this should be considered.

Methodology

Non-Daily Metered (NDM)

The peak demand relationship for the NDM category is calculated by establishing the relationship between demand and weather, then applying this to the 1 in 20 Composite Weather Variable (CWV) provided by Xoserve. Specifically, the weather (CWV) and demand were analysed from the 1996 to 2018 to compare the relationship between demand and weather. The weather in historical years has been corrected for climate change and annual demand changes (by Xoserve), but this has been established through modelling, so there are some assumptions, as inevitably this cannot be as accurate as recent modelled information. As a result of this our analysis considers all years, but focusses on 2018, as this was the most recent year of cold weather. In 2018 historical demand and weather is actual and not modelled. All years display a similar relationship corroborating the 2018 relationships, but there are variations over time for different years. Therefore we decided to use the 2018 relationship, due to it being the most recent period of cold weather, and therefore the most representative of current demand variation in cold weather. This relationship was established for each LDZ, between weather (CWV) and demand and the 1 in 20 CWV from Xoserve was applied to this relationship to establish the 1 in 20 demand for the NDM sector.

The 1 in 20 was then split between load band to get domestic and other sectors' contributions to demands.

For the domestic sector we examined the change in heating season due to increasing thermal efficiency of homes. When a house increases its thermal efficiency the heating is on for less days in the year. As there are more autumn and spring days when the heating no longer needs to be on the house retains more heat. We've modelled this specific element and included it as an adjustment to the domestic element of peak demand. This was calibrated to the 2018 year as a base year and adjustments created for each year of the forecast. Essentially as annual demand decreases annual peaks also decrease but for the domestic element of peak some of this is offset by a shortened heating season (an increased 'peakiness'). Broadly speaking our analysis found this increased 'peakiness' offsets around one third of annual demand reductions. i.e. if domestic annual demand decreases by three units, domestic peak decrease by around two units. This peakiness varies between LDZs and adds between 1.4% and 2.3% to the total LDZ peak demand in 2029, the year it has most impact.

Daily Metered (DM)

This element is split into two groups with peak demand for the highest gas users forecast separately as this results in a more accurate diversification of our 1 in 20 Peak forecast.

These largest of loads have generally well established and consistent behaviour which enables us to forecast their peak demand separately and be comfortable their peak equals their diversified contribution to the 1 in 20. The remainder of the DM sector is forecast in aggregate to determine a diversified demand from this sector. This is forecast by analysing the flows of the last six years to establish their peak demand compared to annual demand (peak load factor – (PLF)). This is then applied to annual demand forecast for this sector to get their contribution to peak.

$$\text{Peak load factor (PLF)} = \frac{\text{(annual demand/365)}}{\text{peak demand}}$$

Due to the limited availability of site specific demand data for embedded generation sites we have used the SHQ for the sites we do have data for then determined a diversified Peak and Annual demand for the remaining sites including those for which we have an accepted quotation. This has been included within the forecast over the next two years, that being the period of time we would expect them to connect. No allowance has been made for growth for these sites beyond year 2 in years 3 out to 10.

Demand forecasts

This next section provides an overview of our latest annual and peak gas demand forecasts through to 2029/30. These forecasts have been developed around the UNC load band categories and relate only to gas that is transported through our systems.

A more detailed view can be found in Appendix A from page 35, which includes the forecasts for both annual and peak demand on a year-by-year and LDZ basis.

Annual demand

These figures, 4 to 6, show historical gas demand and the forecast going forward.

There is a slight decline between 2018 and 2019 due to reductions in some large loads dominated by the larger loads within our Southern LDZs.

The forecast shows a dip for 2020 due to COVID-19 followed by a recovery in 2020 then further small declines year on year due mainly to reductions in domestic demand and to a lesser extent industrial demand.

Interruption ceased to exist in 2011 as a standard type of load – this is shown in blue within the graphs.

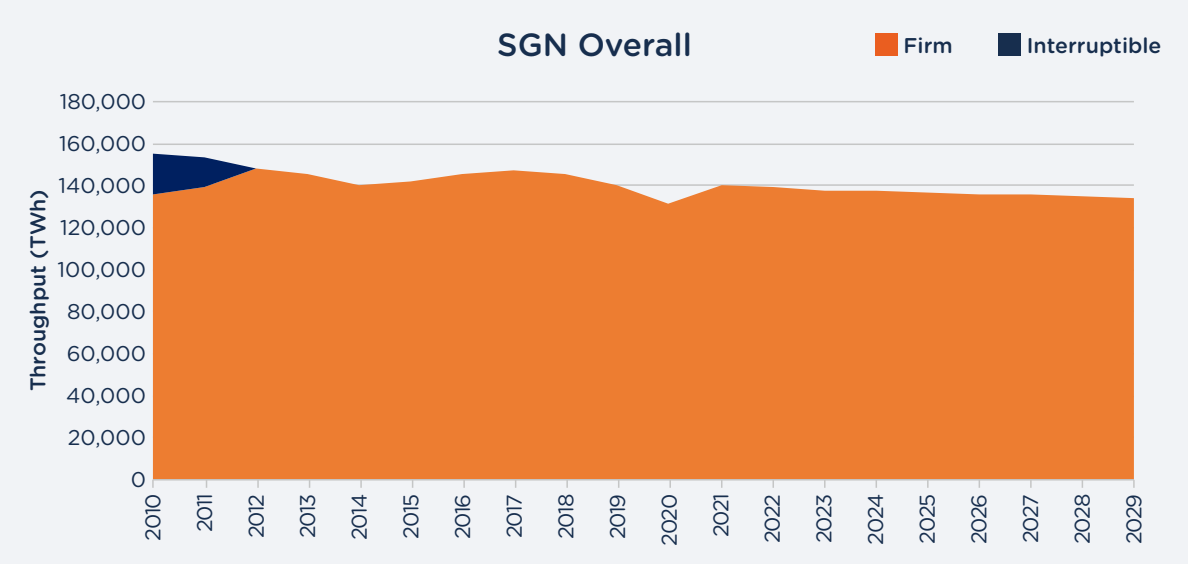


Figure 4 Change in historic and annual demand - SGN overall

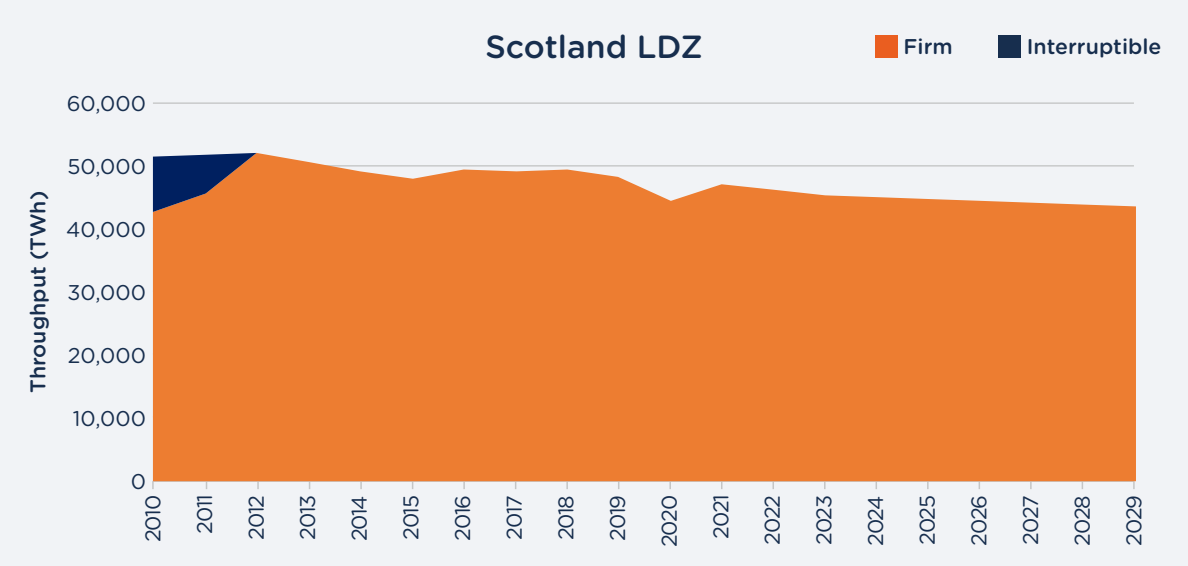


Figure 5 Change in historic and annual demand - Scotland LDZ

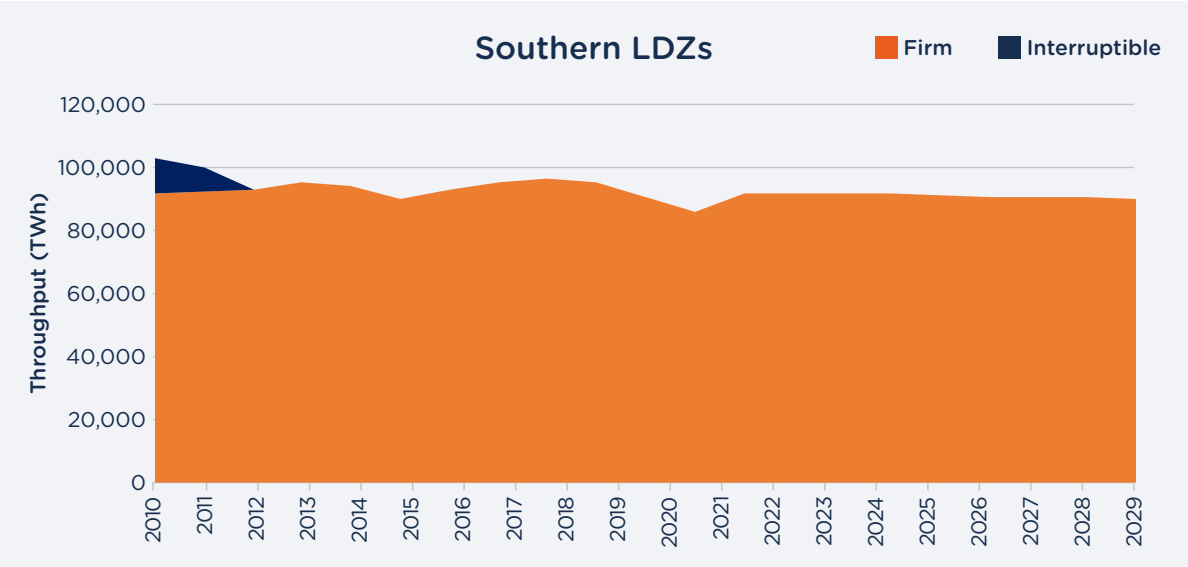


Figure 6 Change in historic and annual demand - Southern LDZs

Average annual change in forecast Annual demand growth (2020–29)			
	SGN	SCOTLAND	SOUTHERN
Annual demand growth	-0.39%	-0.97%	-0.08%

Table 1 Average annual change in forecast Annual demand growth (2020-29)

Peak demand

The following figures, 7 to 9, show the equivalent view for peak demand, the key driver for investment in SGN. The variation in peaks follows annual demands.

Within our forecast the peaks reduce slightly less than annuals. This is largely due to the domestic sector where we have quantified the impact of a shorter heating season from increasingly energy efficient houses. This reduces the annuals more than peaks.

Also, our forecast includes growth for larger loads such as backup power generation the result of which is an increase to peaks relative to annual demand.

Interruption ceased to exist in 2011 as a standard type of load – this is shown in blue within the graphs.

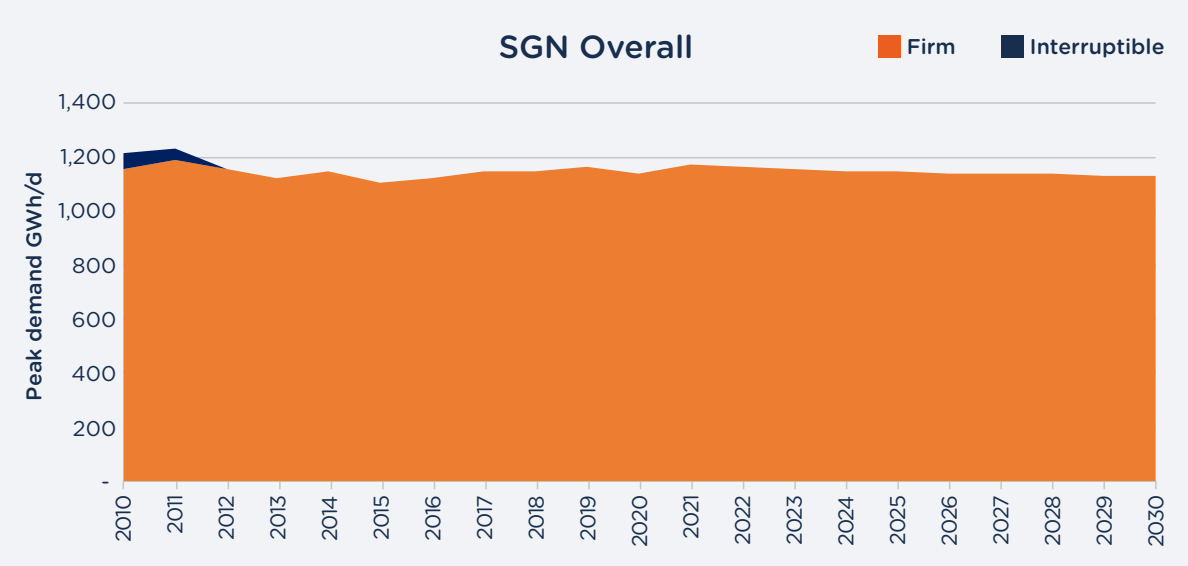


Figure 7 Change in historic and Peak demand - SGN overall

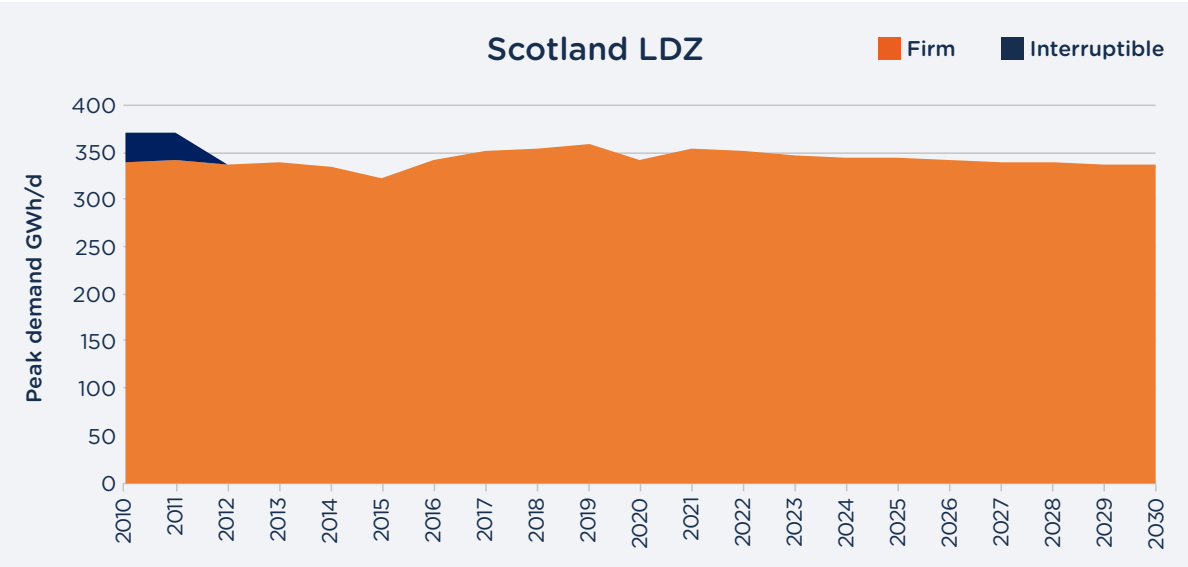


Figure 8 Change in historic and Peak demand - Scotland LDZ overall

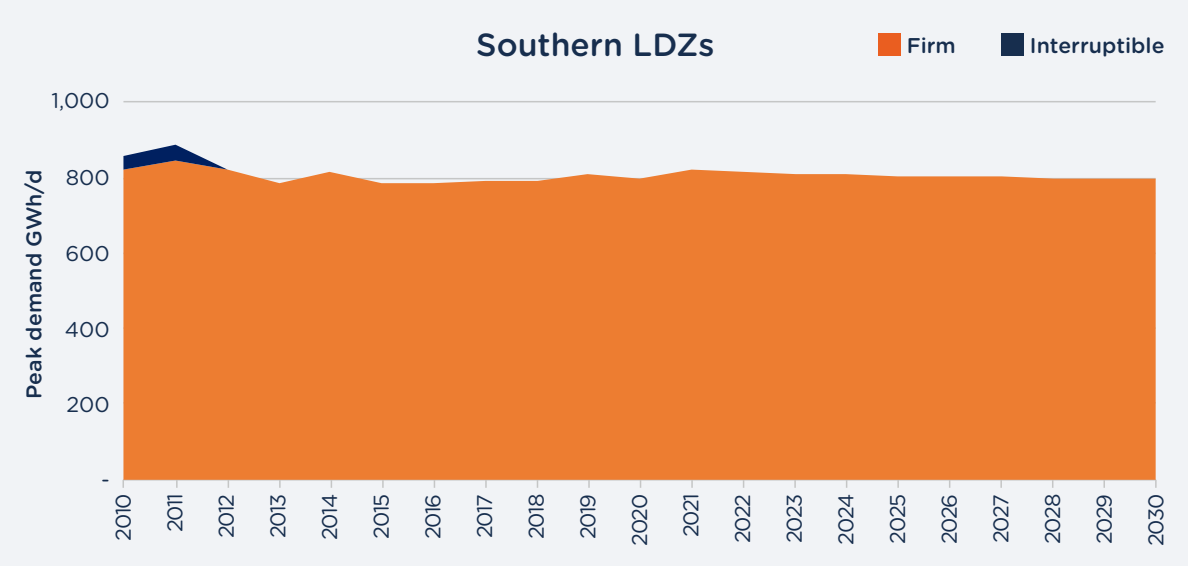


Figure 9 Change in historic and Peak demand - Southern LDZs

Average annual change in forecast Peak demand growth (2020-29)			
	SGN	SCOTLAND	SOUTHERN
Peak demand growth	-0.29%	-0.57%	-0.16%

Table 2 Average annual change in forecast Peak demand growth (2020-29)

Forecast comparisons

Scotland LDZ

The forecast for our Scotland LDZ is very similar to last year with the exception of the COVID-19 impacts in 2020. The forecast is within 1% of 2019 forecast throughout the period. Last year's view that demand would be slightly higher was due to expectations of higher domestic demand. This was initially as a result of increases from behaviour change but later in the forecast period an increase in 'peakiness' for domestic demand meant the 2020 forecast is slightly higher at the end of the period.

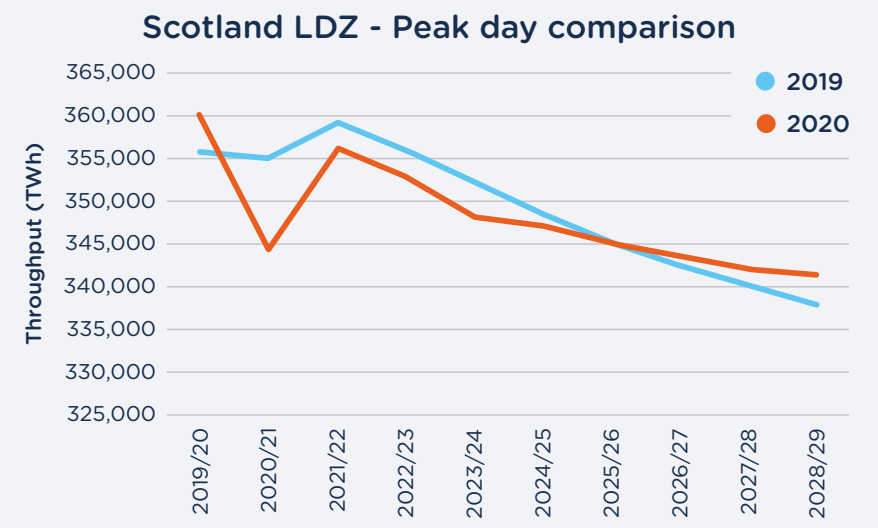


Figure 10 Comparison of total peak demand forecasts – Scotland LDZ

South East LDZ

We've seen an increase in peak demand within the South East DM sector due to higher flows than 2019/20, this accounts for the differences throughout this LDZs forecast. This year's more detailed bottom up analysis has helped confirm the increase in demand is correct.

Our 2020 analysis of the 'peakiness' of demand within the SE showed reductions in Peak demand to be less than in previous years. As a result there is a difference at the end of the forecast period of 5% between this year's and last year's forecasts.

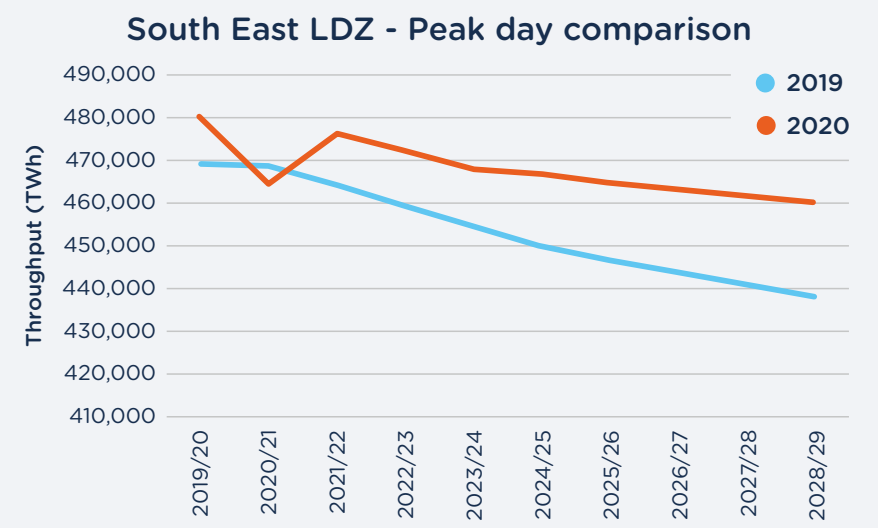


Figure 11 Comparison of total peak demand forecasts – South East LDZ

South LDZ

Expansion of operations over the last year at the largest site in the South LDZ has dominated changes in demand. However, demand is also now much flatter than before due to the revisions we've made to how we analyse domestic and embedded generation demand.

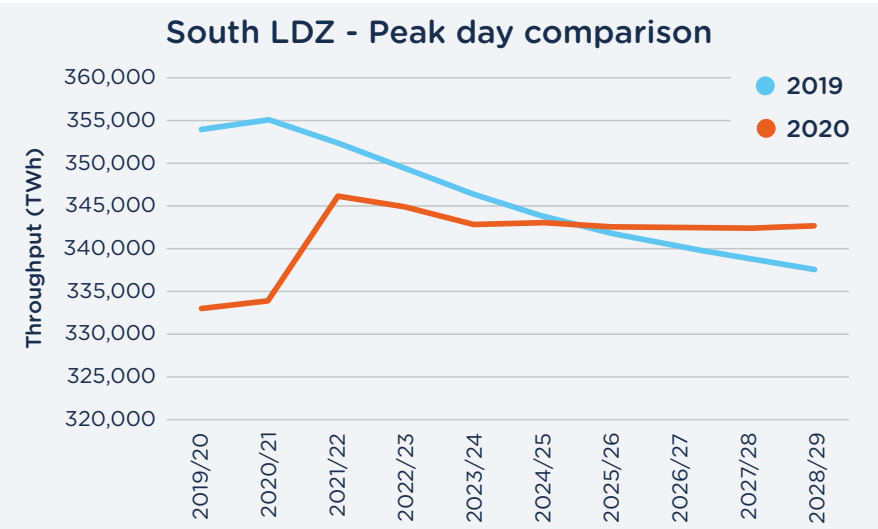


Figure 12 Comparison of total peak demand forecasts - South LDZ

Comparison with scenario based analysis

It's important to note our forecasts aren't based on a set of scenarios. Instead, our forecasts use various inputs to arrive at a set of potential outcomes and from these outcomes we select the most appropriate one for the planning period.

We're often asked to compare our outputs to other work such as National Grid's (NG) annual Future Energy Scenarios (FES) publication. This is a different type of analysis and as a result direct comparison is not appropriate.

FES is a set of scenarios from which a narrative on likely outcomes is produced. Key differences between our forecasts and this analysis is:

Our forecast described in our LTDS is a forecast of gas demand for the next 10 year based on current policies. It's used for efficient and effective planning to ensure our gas is delivered to end customers safely and at least cost. It's also our best prediction of what gas demand will be in the next 10 years based on:

- Government policies which are in place now
- The behaviours which we see currently and how those behaviours may change over the next 10 years based upon recent trends we've seen
- Our forecasts don't have an end point in mind or aim to predict what gas demand would be if certain conditions were to be true, such as the various pathways to net-zero

FES is a set of scenarios, not forecasts, these scenarios aim to explore:

- How the energy landscape would look if a set of conditions existed
- Which policies and incentives need to be created to achieve the scenario aims
- Which technologies need to come to the fore, and
- Which policies may be required to achieve specific conditions, such as net-zero

We're conscious of the importance of engaging with our customers and are always keen to continue to improve on the work we do. From late 2020 we intend to produce a companion publication to our LTDS appraising our forecast against other industry analysis including NG's FES and the Navigant and now Guidehouse Gas Pathways report.

The aim of this publication will be to provide context around how our demand forecast may compare to a set of scenarios, how much extra needs to be done to achieve low carbon targets and how aligned to our demand forecast these scenarios are. Importantly it will aim to establish how long our demand forecast can be aligned to a net-zero target.

Appendix A

Demand forecast tables

Annual demand forecast by load category – SGN overall											
Calendar year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
0 - 73.2MWh	88.9	88.1	87.1	86.1	85.4	85.0	84.2	83.4	82.7	82.1	81.4
73.2 - 732MWh	13.5	10.7	13.5	13.7	13.6	13.5	13.5	13.5	13.4	13.3	13.2
732 – 2,196MWh	6.3	5.1	5.9	5.7	5.5	5.5	5.6	5.6	5.6	5.7	5.7
2,196 – 5,860MWh	4.1	3.3	3.8	3.7	3.6	3.6	3.6	3.6	3.6	3.7	3.7
Total small user	112.8	107.2	110.2	109.2	108.0	107.6	106.8	106.1	105.4	104.9	104.0
>5,860 MWh	7.5	6.0	7.0	6.8	6.6	6.6	6.6	6.6	6.7	6.8	6.7
DM consumption	18.5	16.9	21.7	22.3	22.3	22.3	22.3	22.4	22.5	22.6	22.6
Total large user	26.0	22.9	28.6	29.1	28.9	28.8	28.9	29.0	29.1	29.4	29.3
Total LDZ	138.8	130.1	138.8	138.3	136.9	136.4	135.7	135.1	134.5	134.2	133.3
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	139.4	130.8	139.5	138.9	137.6	137.1	136.4	135.8	135.2	134.9	134.0

Gas supply year	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Total throughput	132.9	137.3	139.1	137.9	137.2	136.5	135.9	135.3	135.0	134.2	133.6

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

Annual demand forecast by load category – Scotland LDZ											
Calendar year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
0 - 73.2MWh	29.2	28.7	28.3	28.0	27.6	27.5	27.1	26.8	26.5	26.2	25.9
73.2 - 732MWh	4.5	3.6	4.4	4.5	4.5	4.5	4.5	4.5	4.5	4.4	4.4
732 – 2,196MWh	2.5	2.1	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3
2,196 – 5,860MWh	1.8	1.4	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Total small user	38.0	35.9	36.8	36.5	36.0	35.8	35.5	35.1	34.8	34.6	34.2
>5,860 MWh	3.2	2.6	3.0	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9
DM consumption	6.9	6.0	7.2	6.8	6.4	6.3	6.3	6.3	6.3	6.4	6.4
Total large user	10.2	8.6	10.2	9.8	9.3	9.2	9.2	9.2	9.2	9.3	9.3
Total LDZ	48.2	44.5	47.1	46.3	45.3	45.0	44.6	44.3	44.0	43.9	43.5
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	48.3	44.6	47.3	46.5	45.5	45.2	44.8	44.5	44.2	44.1	43.6

Gas supply year	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Total throughput	45.6	46.6	46.7	45.7	45.3	44.9	44.6	44.3	44.1	43.7	43.5

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

Annual demand forecast by load category – South East LDZ											
Calendar year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
0 - 73.2MWh	36.1	36.0	35.6	35.2	34.9	34.7	34.4	34.2	33.9	33.7	33.4
73.2 - 732MWh	5.3	4.1	5.2	5.2	5.1	5.1	5.0	5.0	4.9	4.8	4.8
732 – 2,196MWh	2.1	1.6	1.8	1.8	1.7	1.7	1.8	1.8	1.8	1.8	1.8
2,196 – 5,860MWh	1.3	1.0	1.2	1.2	1.1	1.1	1.1	1.1	1.2	1.2	1.2
Total small user	44.8	42.7	43.8	43.3	42.9	42.7	42.4	42.1	41.8	41.6	41.2
>5,860MWh	2.0	1.6	1.8	1.8	1.7	1.7	1.7	1.8	1.8	1.8	1.8
DM consumption	5.9	4.8	5.9	5.8	5.6	5.6	5.6	5.7	5.7	5.7	5.7
Total large user	7.9	6.4	7.7	7.6	7.4	7.3	7.4	7.4	7.5	7.5	7.5
Total LDZ	52.7	49.1	51.5	50.9	50.2	50.0	49.7	49.5	49.2	49.1	48.8
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	53.0	49.4	51.8	51.1	50.5	50.3	50.0	49.8	49.5	49.4	49.0

Gas supply year	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Total throughput	50.3	51.2	51.3	50.7	50.4	50.1	49.8	49.6	49.4	49.1	48.9

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

Annual demand forecast by load category – South LDZ											
Calendar year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
0 - 73.2MWh	23.5	23.4	23.2	23.0	22.8	22.8	22.6	22.5	22.3	22.2	22.1
73.2 - 732MWh	3.8	3.0	3.8	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
732 – 2,196MWh	1.7	1.4	1.6	1.6	1.5	1.5	1.5	1.5	1.6	1.6	1.6
2,196 – 5,860MWh	1.0	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Total small user	30.0	28.6	29.5	29.4	29.2	29.1	29.0	28.9	28.8	28.7	28.6
>5,860 MWh	2.2	1.8	2.1	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0
DM consumption	5.7	6.1	8.6	9.7	10.3	10.3	10.4	10.4	10.4	10.5	10.5
Total large user	7.9	7.9	10.6	11.7	12.3	12.3	12.3	12.4	12.4	12.5	12.5
Total LDZ	37.9	36.5	40.2	41.1	41.4	41.4	41.3	41.3	41.2	41.2	41.1
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	38.1	36.7	40.4	41.3	41.6	41.6	41.5	41.5	41.4	41.4	41.3

Gas supply year	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Total throughput	37.1	39.5	41.1	41.6	41.6	41.6	41.5	41.5	41.4	41.3	41.3

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

1 in 20 peak day firm demand forecast – at a glance											
Calendar year	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Scotland	359.9	344.2	356.3	352.9	348.2	347.1	345.0	343.7	342.0	341.4	339.2
South East	480.4	464.4	476.0	472.3	468.0	466.7	464.7	463.1	461.5	459.9	458.2
South	332.9	333.8	346.2	344.9	342.7	343.0	342.6	342.4	342.3	342.6	342.0
SGN overall	1,173.2	1,142.4	1,178.5	1,170.2	1,159.0	1,156.8	1,152.3	1,149.2	1,145.8	1,143.9	1,139.3

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	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
0 - 73.2MWh	854.5	850.5	844.2	838.6	833.8	831.8	827.0	823.1	818.9	815.5	811.9
73.2 - 732MWh	117.1	93.2	116.7	118.5	117.6	117.4	117.2	116.8	116.1	115.4	114.4
732 – 2,196MWh	39.0	31.3	36.1	35.2	34.0	34.0	34.1	34.4	34.7	35.1	35.1
2,196 – 5,860MWh	25.0	20.1	23.2	22.6	21.9	21.9	21.9	22.1	22.3	22.5	22.5
>5,860 MWh	45.9	37.0	42.7	41.6	40.2	40.2	40.3	40.6	41.0	41.4	41.4
Total NDM consumption	1,076.5	1,031.9	1,062.8	1,056.4	1,047.4	1,045.3	1,040.6	1,037.0	1,032.9	1,030.1	1,025.3
DM firm consumption	94.9	108.7	113.9	112.0	109.7	109.7	109.9	110.4	111.1	112.0	112.2
Total firm consumption	1,171.4	1,140.6	1,176.7	1,168.4	1,157.2	1,155.0	1,150.5	1,147.4	1,144.0	1,142.1	1,137.5
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	1,173.2	1,142.4	1,178.5	1,170.2	1,159.0	1,156.8	1,152.3	1,149.2	1,145.8	1,143.9	1,139.3

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	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
0 - 73.2MWh	249.5	247.1	244.9	243.2	241.2	240.3	238.3	236.8	234.8	233.6	231.8
73.2 - 732MWh	36.4	29.4	36.0	36.5	36.2	36.2	36.1	36.1	36.1	36.0	35.9
732 – 2,196MWh	14.6	11.9	13.7	13.5	13.1	13.1	13.1	13.1	13.1	13.1	13.1
2,196 – 5,860MWh	10.1	8.3	9.6	9.4	9.1	9.1	9.1	9.1	9.1	9.1	9.1
>5,860MWh	18.5	15.0	17.4	17.0	16.6	16.5	16.5	16.5	16.6	16.6	16.5
Total NDM consumption	329.0	311.6	321.6	319.5	316.2	315.2	313.1	311.6	309.7	308.5	306.4
DM firm consumption	30.4	32.1	34.2	32.9	31.5	31.4	31.4	31.6	31.9	32.3	32.3
Total firm consumption	359.4	343.7	355.8	352.5	347.7	346.6	344.6	343.2	341.5	340.9	338.7
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	359.9	344.2	356.3	352.9	348.2	347.1	345.0	343.7	342.0	341.4	339.2

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	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
0 - 73.2MWh	363.1	362.1	359.3	357.0	355.0	353.9	352.0	350.4	348.9	347.2	346.2
73.2 - 732MWh	48.1	37.7	47.5	47.5	47.0	46.6	46.2	45.8	45.1	44.4	43.6
732 – 2,196MWh	13.4	10.4	12.0	11.6	11.2	11.3	11.3	11.5	11.6	11.8	11.9
2,196 – 5,860MWh	8.6	6.7	7.7	7.5	7.2	7.2	7.3	7.4	7.5	7.6	7.6
>5,860MWh	13.2	10.3	11.8	11.5	11.1	11.1	11.2	11.3	11.5	11.7	11.7
Total NDM consumption	442.6	427.1	438.3	435.1	431.4	430.1	428.1	426.4	424.6	422.8	421.1
DM firm consumption	36.9	36.6	37.0	36.4	35.8	35.8	35.8	35.9	36.1	36.3	36.4
Total firm consumption	479.6	463.6	475.3	471.5	467.2	465.9	463.9	462.3	460.7	459.1	457.4
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	480.4	464.4	476.0	472.3	468.0	466.7	464.7	463.1	461.5	459.9	458.2

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	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
0 - 73.2MWh	241.9	241.3	240.0	238.5	237.7	237.6	236.6	235.9	235.2	234.7	234.0
73.2 - 732MWh	32.6	26.1	33.2	34.5	34.4	34.6	34.8	34.9	35.0	35.0	34.9
732 – 2,196MWh	11.0	9.0	10.4	10.1	9.7	9.7	9.7	9.8	10.0	10.1	10.1
2,196 – 5,860MWh	6.3	5.1	5.9	5.7	5.5	5.5	5.6	5.6	5.7	5.8	5.8
>5,860MWh	14.2	11.7	13.4	13.0	12.5	12.5	12.6	12.7	12.9	13.1	13.1
Total NDM consumption	304.8	293.2	302.9	301.8	299.8	299.9	299.3	299.0	298.6	298.7	297.9
DM firm consumption	27.6	40.0	42.8	42.6	42.4	42.6	42.7	42.9	43.1	43.4	43.5
Total firm consumption	332.4	333.3	345.7	344.4	342.2	342.5	342.0	341.9	341.8	342.1	341.4
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	332.9	333.8	346.2	344.9	342.7	343.0	342.6	342.4	342.3	342.6	342.0

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

Appendix B

2019 flows

This appendix describes annual flows during the 2019 calendar year

Annual flows

Forecasts of annual 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 2019 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 2019 calendar year with the forecasts presented in the 2019 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.

Annual demand for 2019 (TWh) - Scotland LDZ			
	Actual demand	Weather corrected demand	2018 LTDS forecast demand
0 - 73.2MWh	29.2	29.2	29.8
73 – 5,860MWh	8.8	8.8	8.9
>5,860MWh firm	10.3	10.3	10.6
Total LDZs	48.3	48.3	49.3
Shrinkage	0.2	0.2	0.2
Total throughput	48.5	48.5	49.4

Table 12: Annual demand for 2019 (TWh) – Scotland LDZ

Annual demand for 2019 (TWh) - South East LDZ			
	Actual demand	Weather corrected demand	2018 LTDS forecast demand
0 - 73.2MWh	35.9	36.6	37.5
73 – 5,860MWh	8.5	8.6	8.5
>5,860MWh firm	7.9	7.9	9.3
Total LDZs	52.4	53.2	55.3
Shrinkage	0.3	0.3	0.3
Total throughput	52.6	53.5	55.6

Table 13: Annual demand for 2019 (TWh) – South East LDZ

Annual demand for 2019 (TWh) - South LDZ			
	Actual demand	Weather corrected demand	2018 LTDS forecast demand
0 - 73.2MWh	23.8	24.3	24.1
73 – 5,860MWh	6.3	6.5	6.6
>5,860MWh firm	8.0	8.1	8.5
Total LDZs	38.2	38.8	39.2
Shrinkage	0.2	0.2	0.2
Total throughput	38.4	39.0	39.4

Table 14: Annual demand for 2019 (TWh) – South LDZ

LDZ winter severity statistics

Sourced from the May 2020 National Grid Winter Severity Report 2019/20, these statistics cover the gas industry interpretation of winter lasting from October 2019 to March 2020 inclusively.

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 60 years. This would be a 1 in 60, cold winter and this occurred in 1962/63.

UK wide the winter of 2019/20 was the twelth warmest winter recorded in the last 60 years.

1 in 'X' winter severities per LDZ	
LDZ	1 in 'X'
Scotland	5-warm
South East	4-warm
South	4-warm
National	6-warm

Table 15: 1 in X winter severities per LDZ

Maximum and minimum demand

Table 16 indicates the highest and lowest daily demands for each LDZ seen between October 2019 and September 2020 and when they occurred.

Table 17 shows the % demand of the forecast peak day for each LDZ on the maximum and minimum demand day of gas year 2019-20

Actual demand on the maximum and minimum demand day of gas year 2019/20		
LDZ	Maximum day 2019/20	Minimum day 2019/20
Scotland	22.61 mscmd (11/02/2020)	4.63 mscmd (12/08/2020)
South East	26.50 mscmd (20/01/2020)	3.88 mscmd (08/08/2020)
South	19.64 mscmd (21/01/2020)	3.31 mscmd (09/08/2020)

Table 16: Actual demand on the maximum and minimum demand day of gas year 2019/20

Maximum and minimum demand of gas year 2019/20 (as a percentage)			
LDZ	Forecast peak day	Actual maximum peak day	Actual minimum peak day
Scotland	32.32 mscmd	70.0%	14.3%
South East	43.27 mscmd	61.2%	9.0%
South	33.13 mscmd	59.3%	10.0%

Table 17: Maximum and minimum demands of gas year 2019/20 (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.

The figures include nine sites which currently have suspended letters of direction.

Portfolio of biomethane sites		
LDZ	Total	Equivalent no of domestic customers
Scotland	18	112,139
Southern	20	124,477
Total	38	236,616

Table 18: Portfolio of sites as of end August 2020

<7bar distribution projects

Tables 19 to 24 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.

Projects under construction

<7 Bar major projects under construction in Scotland LDZ		
Project	Build year	Project scope
We have no major projects currently under construction in Scotland LDZ		

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

<7 Bar major projects under construction in South LDZ		
Project	Build year	Project scope
Kennet Walk, Reading	2020/21	0.1km x 400/630mm PE and three DGs

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

<7 Bar major projects under construction in South East LDZ		
Project	Build year	Project scope
We have no major projects currently under construction in South East LDZ		

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

Projects under consideration

<7 Bar major projects under consideration in Scotland LDZ		
Project	**Build year**	**Project scope**
Aberlady - Gullane (Phase 1)	2021/22	2.6km x 315/355mm PE MP
Winchburgh MP	2021/23	2.28km x 355mm MP PE and 1km x 250mm MP PE
Haddington - Dunbar IP leg	2022/23	1.6km x 315mm/250mmHDPE
Hilton Drive, Aberdeen	2022/23	1.72km x 355mmHDPE
South East Wedge, Shawfair	2022/25	4" ST HP pipeline / HP to IP TRS / 2.7km x 125mm HDPE IP / IP to Local MP DPG / 88m of 180mm MDPE local MP
Perth Bridge DPG Outlet	2023/24	2.7km x 400mm PE MP
Tranent IP – Phase 2	2024/25	2.4km x 315 HDPE IP

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

<7 Bar major projects under consideration in South LDZ		
Project	**Build year**	**Project scope**
Bicester MP (Phase 1)	2021/22	1.66km x 315mmPE MP
Newton Tony DPG	2021/25	Replace DPG
Aldermaston (Phase 1)	2022/23	2.4km x 180mmPE MP
Phase 3 A422 Brackley	2022/23	2.05km x 315mmPE MP
Newbury IP	2023/24	3.4km x 12" ST IP

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

<7 Bar major projects under consideration in South East LDZ		
Project	**Build year**	**Project scope**
Kingsnorth Industrial Estate, Rochester	2021/22	1.4km x 500mm PE MP
Folkestone DPG	2021/22	Replace DPG
Mitcham Common IP MP CGS	2022/23	Replace CGS
Mitcham Depot CGS	2022/23	Replace CGS
Hawe Lane, Canterbury	2023/24	1.6km x 180mm PE MP
Old London Road, Hythe	2023/24	1.7km x 355mm PE MP
Rocks Road, Uckfield	2024/25	0.7km x 355mm PE MP
Hazel Grove Road, Haywards Heath	2024/25	0.9km x 250mm PE MP
Collier Street, Maidstone	2024/25	2km x 180mm PE MP

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

Appendix C

Links and contacts

Internal contacts

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.

network.capacity@sgn.co.uk
Our email address for any questions regarding network capacity, including our Long Term Development Statement.

leyon.joseph@sgn.co.uk
Leyon Joseph - Network Planning Manager – above 7 bar transmission system.

barrie.gillam@sgn.co.uk
Barrie Gillam - LTS Planning Officer – above 7bar transmission system, LTDS contact.

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Mailbox for requests for increased loads at existing sites where meter capacity may be an issue.

linesearchbeforeudig.co.uk
Safety is our number one priority. Before you dig always request location details of our underground equipment and pipes through this fast on-line service.

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

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We are always interested in engaging with our stakeholders. This is how we look to improve the way we do things by listening to and acting on your feedback.

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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

Joint Office of Gas Transporters
The Joint Office is where the UNC can be found. It also has 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.

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

Glossary

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

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

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 (green gas) that's 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 10^6 cubic metres, one billion cubic metres (bcm) equals 10^9 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.

ECO (Energy Companies Obligation) - The Energy Company Obligation (ECO) is a UK government energy efficiency scheme introduced to help reduce carbon emissions and tackle fuel poverty.

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 a 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 UK.

H100 - 100% hydrogen project – Our H-100 hydrogen project has been designed to demonstrate the safe, secure and reliable distribution and use of hydrogen in a domestic setting to reduce carbon output and progress towards the 2050 UK (2045 Scotland) 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 we can interrupt the flow of gas to the supply point and which is prepared to be interrupted if the Transporter needs it to.

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

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

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

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

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

Local Distribution Zone (LDZ) - A geographic area supplied by one or more NTS offtakes. Consists of high pressure (>7 barg) and lower pressure distribution system pipelines.

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

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

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

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

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

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

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

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

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

Offtake - An installation defining the boundary between NTS and LTS or a very large customer. 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 has been called RIIO-GD1 and covers April 2013 to March 2021. RIIO-GD2 will commence in April 2021 and last five years to 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 customers.

Shrinkage - Gas that is input to the system but is not delivered to customers or injected into storage. It's 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.

Unaccounted for Gas (UAG) - Gas lost during transportation. Includes leakage, theft and losses due to the method of calculating the Calorific Value.

Uniform Network Code (UNC) - The Uniform Network Code covers the arrangements between National Grid, Shippers and the GDNs following the selling off by national grid of four of its gas networks.

UKCS - United Kingdom Continental Shelf.

UK-Link - A suite of computer systems that support Uniform Network Code operations. Includes Supply Point Administration, Invoicing, and the Sites and Meters database.

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

Disclaimer

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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

SGN
Your gas. Our network.

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