

Gas Transmission



Delivering your future gas transmission system

National Grid Gas Transmission's draft
business plan 2021-26

nationalgrid

July 2019

Who we are and what we do

We are National Grid Gas Transmission (NGGT) and we are proud to own, manage and operate the high-pressure gas national transmission system (NTS) in Great Britain (GB). Our network is a gas superhighway that connects our nation; we balance supply and demand on a day-to-day basis to make gas available when and where it's needed. We develop, maintain, and operate an economic and efficient network and we facilitate competition in the supply of gas in GB to keep energy costs to consumers as low as possible.

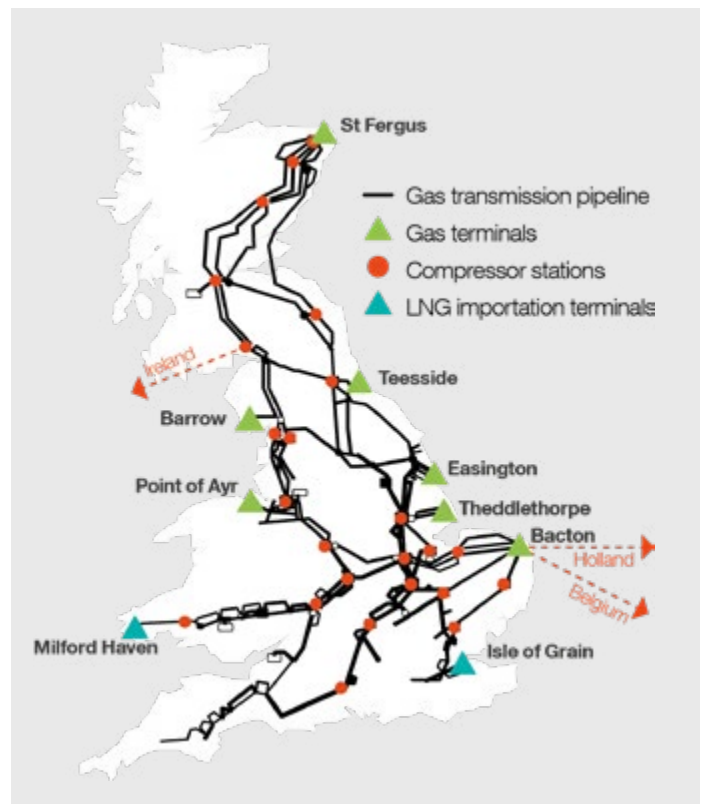
We are at the heart of the energy system as the combined gas transmission system operator (TSO), undertaking both the gas transmission owner and system operator roles. Today, gas delivers three times as much energy as electricity; it keeps 80% of the UK's 28 million homes¹ warm and comfortable, generates electricity and fuels industrial and manufacturing processes. Failure to supply gas (especially to vulnerable consumers), and any major uncontrolled release of gas from the high-pressure network, are both potential threats to life and property.

The network includes pipes and compressor stations. They connect production through terminals to the distribution systems. In the UK, gas enters the transmission system through importation, reception terminals, storage facilities and interconnectors. From our Gas National Control Centre (GNCC), we meet changing customer needs by optimising the physical configuration of assets and utilising commercial tools. Compressor stations located along the network play a vital role in keeping large quantities of gas flowing through the system to the areas of demand. The network must be kept constantly in balance, which is achieved by buying, selling and using stored gas.

Part of a leading FTSE 100 company with a social purpose

We are part of National Grid plc. We support the highest standards of governance required by the London and New York stock exchanges. We are committed to being a responsible business. We want to be a force for positive social and environmental change so we act responsibly in everything we do, and also in the way we do it. This belief is fundamental to the way we work at National Grid.

Our gas transmission network



Our gas transmission network comprises approximately:

7,660 km
of high pressure pipeline

600
above ground installations

24
compressors sites

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/729317/Energy_Consumption_in_the_UK_ECUK_2018.pdf

National Grid Gas Transmission

Welcome to our draft business plan

We are an organisation with a purpose: we bring energy to life.

That purpose drives our vision to do two things: exceed the expectations of our customers, shareholders and communities today and make possible the energy systems of tomorrow.

We believe our nation should have a clean, reliable energy system to help address the effects of climate change, improve the quality of the air we breathe and power growth and prosperity in our economy for future generations.

We are committed to continue delivering a safe, reliable and resilient network for homes, businesses and communities both today and into the future. And to play our part in decarbonising Great Britain's energy system so that the transition to a clean energy system is fair and leaves no-one behind. We want to achieve all of this at the lowest possible cost for current and future bill payers.

Even though the precise pathway to achieve the government's recent commitment to Net Zero² by 2050 is uncertain, it is clear gas has an important role to play in supporting the transition to low carbon electricity, heat, industry and transport at the lowest cost and with least disruption to consumers. We are fully committed to playing our part in this transition.

That is why this draft plan matters. Against the backdrop of uncertainty, it covers a crucial five-year period from 2021 to 2026. It sets out what we will do to support a reliable, cleaner whole energy system, improve services for our customers and it describes our commitments to enhance the environment.

The plan we have set out will help us to make a positive impact on society for the benefit of everyone. We balance the needs of today's and tomorrow's consumers by delivering our commitments. We will keep our portion of domestic consumers' energy bills at or below £10³ in the short-term, and invest for the longer-term to keep energy flowing, maintain security of supply in a digital age and enable the transition to low carbon electricity, heat and transport.

We are proud to provide an essential service and our core values reflect the responsibilities that go with that:

Safety above everything We always do the right thing We find a better way

We continue engagement with you on this draft plan and will take comments on board for our next draft plan in October.

² <https://www.gov.uk/government/news/pm-theresa-may-we-will-end-uk-contribution-to-climate-change-by-2050>

³ Excluding inflation



Part 1

Executive summary

1. A message from our Chair

Great Britain is highly dependent on a safe, reliable and resilient gas transmission system.

Presently, 80% of homes rely on natural gas for heating as do many businesses, commercial properties and public buildings such as schools and hospitals. Gas is also crucial for many large-scale industrial processes. Gas is used for 40% of electricity generation, supporting the removal of coal and providing flexible back-up for intermittent generation.

For the future, we recognise the urgent need to tackle climate change. We support the government's commitment to Net Zero by 2050 and recognise gas has an important role to play in supporting the transition to low carbon electricity, heat, industry and transport. It provides the reliability and flexibility to support growth in renewable generation and it gives Great Britain options to decarbonise commercial vehicles and industry. Perhaps most importantly, gas can also help to decarbonise heat, the biggest source of UK carbon emissions, at the lowest cost and with least disruption to consumers.

To provide this essential service to society today and into the future we have carried out our largest-ever listening exercise with you for this draft plan, which reflects our collective thinking. For the first time, we have built our plan around your feedback. Our independent stakeholder user group scrutinised our proposals as we have built our plan, challenging us to respond directly to your views; we hope the resulting draft is both easy to understand and clear on what we will deliver to you and why it matters. Our plans must deliver long-lasting benefits for energy consumers.

Our commitment to you is to maintain a world-class gas network that supplies gas when and where it's needed while keeping our costs as low as possible, in a way that's sustainable and safe. We will do this for today's and tomorrow's customers and consumers and we'll help to deliver the least cost pathway to decarbonise our energy system.

To meet this commitment, we must address some challenges. Within the changing energy landscape, we are managing an ageing network with many assets at the end of their design life. Now's the time when we must make some important decisions on replacing, maintaining or decommissioning them. These decisions have long-term impacts on cost, risk and the level of network capability we offer to stakeholders, so we will be engaging closely with you about our network capability framework. We will also consider further the potential implications of the government's commitment to Net Zero by 2050 and discuss that with you over the summer.

Finally, this is a draft plan, reflecting the input we have received so far. We are still listening to your views and we will engage further before making the final submission to our regulator, Ofgem, in December.

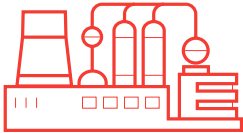


Nicola Shaw
Chair of National Grid
Gas Transmission

2. How we have delivered in RIIO-1

Our RIIO-2 plan is based on our strong track record for delivering value for consumers in the current regulatory period. We have taken learnings from RIIO-1 to inform how we can better deliver in RIIO-2, carrying forward delivery performance, cost performance and innovation benefits.

Annually, we produce a regulatory report pack that is provided to Ofgem and published on our website. This has allowed all stakeholders to understand how we have performed throughout the RIIO-1 period and it is available here⁴.



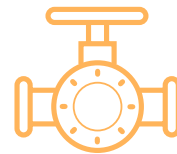
Keeping the gas flowing

We have maintained reliability and efficiently facilitated the delivery of 99.9896% of gas requirements for customers, allowing consumers to use gas as and when they want.



Improving customer and stakeholder satisfaction

Our customer and stakeholder satisfaction scores are increasing. Customer satisfaction has gone from 7.1 to 7.8, and stakeholder satisfaction from 7.7 to 8.1.



Investing in the health of our assets

We met our Network Output Measures (NOMs) targets by investing £100m more than our regulatory allowances to maintain the health of our assets.



Protecting the gas network

We have upgraded the physical security of key infrastructure sites and improved our data centres to protect against external threats.



Innovating to reduce costs

We have provided value of £4 for every £1 invested in innovation.



Serving new customers

Our Customer Low Cost Connections (CLoCC) project substantially reduces the time and cost to connect for new customers.



Reduced environmental impact

All-time low rate of nitrogen oxide (NOx) resulting from the investment strategy we have made on the network.



World-class safety performance

We have achieved zero injuries to the public and world-leading safety performance.



Delivering value for money

We have driven efficiency across our business, including a £45m saving by the end of RIIO-1 through our UK efficiency programme.

⁴ <https://www.nationalgridgas.com/about-us/business-planning-riio/how-were-performing>
<https://www.nationalgridgas.com/sites/gas/files/documents/National%20Grid%20Gas%20SO%20Incentive%20Supporting%20Information%202017-18%20v10.pdf>

3. Building a stakeholder-led plan

We have built our plan by listening and incorporating feedback from our customers, stakeholders and consumers. Over the last two years, we have carried out our most extensive ever listening exercise to understand your priorities and future requirements. We have undertaken engagement connecting with more than 500 stakeholders, 3,000-plus domestic consumers and 1,000 major energy users.

Together with National Grid Electricity Transmission (NGET), we were the first network to establish our independent stakeholder user group. They have been challenging and reviewing how we engage with stakeholders in developing our business plan.

We have provided more information about our emerging ideas for our business plan to you, our stakeholders, than ever before including a consultation in February 2019⁵. Thank you for your feedback.

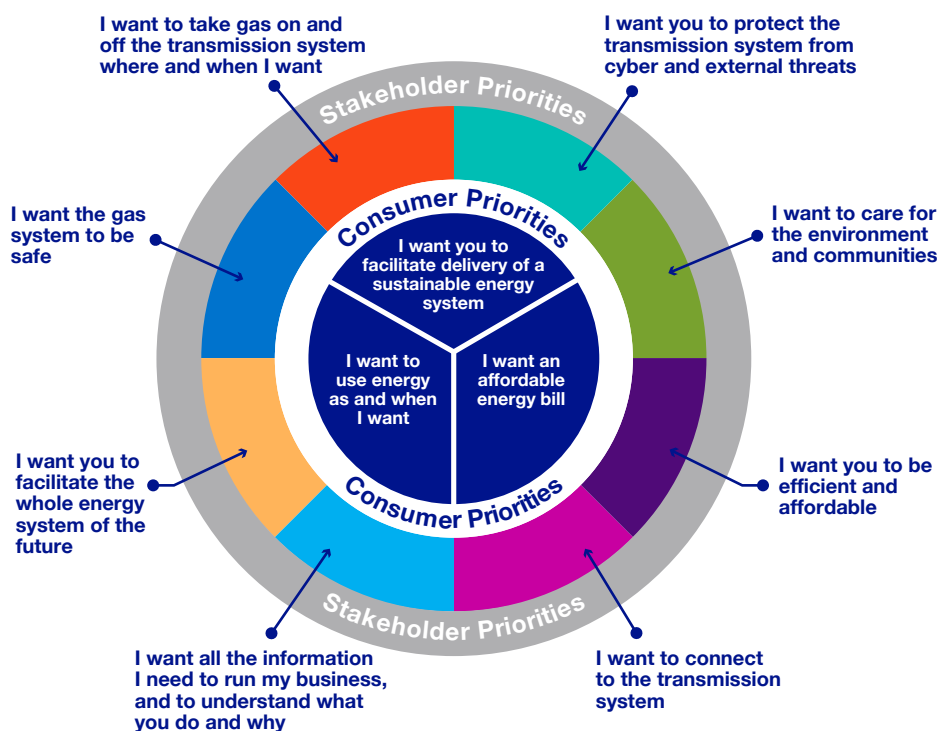
What you've said

We've built our draft business plan around what you've said. As consumers, you've told us your three main priorities:

- **I want an affordable energy bill** – Our network and facilitation of the market allows our customers to supply gas to where and whom they want, helping keep wholesale costs low to the ultimate benefits of consumers.

- **I want to use energy as and when I want it** – Consumers expect us to provide a highly reliable service.
- **I want you to facilitate delivery of a sustainable energy system** – You want us to support the energy system transition whilst minimising disruption to your life and our impact on the environment. Throughout our stakeholder engagement we have promised to continue to listen and respond to your feedback. And throughout our consumer engagement programme we identified that the environment, particularly as we move towards a decarbonised energy system, is very important to consumers. We therefore amended our third priority to better reflect this. It was previously 'I want you to minimise disruption to my life.'

Against a backdrop of an uncertain energy landscape, we are mindful that there is a careful balance to be achieved in delivering these priorities for consumers. We will make critical decisions regarding replacing, maintaining or decommissioning our assets, as well as driving forward innovation to ensure the most fit for the future solutions. We will continue to engage on these important topics over the summer, alongside exploring with domestic consumers the overall acceptability of our plan.



⁵ <https://www.nationalgridgas.com/document/125911/download>

4. Our draft proposals and costs for RIIO-2 at a glance

This plan has been shaped by what we have heard against the priorities of our stakeholders and consumers; it is ambitious, innovative and will be challenging to deliver. We will work towards its goals with you, so that our actions are transparent, and we can deliver effectively on our commitments.

Our draft proposals forecast an average annual total cost in RIIO-2 at £599m (excluding pass through costs, potential customer triggered network reinforcement and real price effects). Below, we have presented what we plan to do against each stakeholder priority, organised into Ofgem's three output categories:

Maintain a safe and resilient network

I want the gas system to be safe
Forecast cost £14m per year

- Maintain our world-class level of safety whilst continuing to pursue our goal of zero harm to protect the public, our assets and people
- We will comply with legislation through routine and preventive safety activities

I want to take gas on and off the transmission system where and when I want
Forecast cost £288m per year

- Deliver the network capability that meets our stakeholders' needs
- Invest £888m in our asset health programme to maintain our current level of reliability and availability
- Invest in systems and capabilities to optimise operation of our network to ensure customers' requirements are met

I want you to protect the transmission system from cyber and external threats
Forecast cost £123m per year

- Invest £617m to improve resilience to cyber and physical attacks on the transmission system

Deliver an environmentally sustainable network

I want you to facilitate the whole energy system of the future – innovating to meet the challenges ahead.
Forecast cost £21m per year

- Play a leading role in the whole energy and decarbonisation debate
- Invest in capabilities and systems to understand the most efficient options for the future whole energy system
- Drive innovation to enable solutions for decarbonising the industry

I want you to care for the environment and communities
Forecast cost £72m per year

- Deliver two new commissioned compressors in RIIO-2 and complete five more by 2030 to improve air quality and reduce NOx emissions
- Reduce the carbon footprint of our business
- Take action at 77 redundant sites and assets, seeking to enhance the natural environment where possible
- Continue our support for the communities we work in and commit 0.3% of what we spend on major projects to supporting community initiatives

Meet the needs of consumers and network users

I want to connect to the transmission system
Forecast cost £2m per year

- Be more responsive to the needs of connection customers, improving our customer satisfaction scores
- Embed the improvements resulting from our Customer Low Cost Connections (CLoCC) project into business as usual, enabling standard connections for less than £1m in under 12 months

I want you to be efficient and affordable*

- Commit to 4% efficiency on our total capex across RIIO-2
- Build in 7.4% operational cost efficiency from our RIIO-1 UK efficiency programme
- Commit to a further 5.6% operational cost efficiency across RIIO-2
- Continue to benchmark, market test and use native competition throughout RIIO-2

I want all the information I need
Forecast cost £13m per year

- Enable competition and foster innovation by sharing our data openly wherever possible
- Collaborate and share data with network companies to build a whole system view
- Invest in our people and systems, to develop new capabilities allowing us to support more information sharing
- Provide more transparency around our financial and operational performance

***Business support costs to deliver against our key priorities – forecast cost £65m per year**

Pass through costs such as licence fees and tax – forecast cost of £170m per year

5. Consumer benefits

Our proposals will deliver consumer benefits as shown below in relation to our three consumer priorities:

Maintain a safe and resilient network

I want the gas system to be safe

“I want to use energy as and when I want” – our commitment to safety-related inspections, maintenance and asset replacement avoids unplanned downtime of network elements, which could disrupt continuity of gas supply.

“I want you to facilitate delivery of a sustainable energy system” – focus on zero harm protects society from potential disruption and damage to public health, business, transport and the natural environment.

I want to take gas on and off the transmission system where and when I want

“I want to use energy as and when I want” – enabling a wide range of supplies ensures gas is reliably available.

“I want you to facilitate delivery of a sustainable energy system” – it is in consumers’ interests to keep future energy options open which we will deliver by determining and delivering the network capability our stakeholders need.

“I want an affordable energy bill” – reliability enables access to the lowest cost gas supplies, impacting the wholesale cost energy consumers incur.

I want you to protect the transmission system from cyber and external threats

“I want to use energy as and when I want” – improve the safety and resilience of the network to ride through and recover from malicious events that threaten to disrupt continuity of GB energy supplies.

Deliver an environmentally sustainable network

I want you to facilitate the whole energy system of the future – innovating to meet the challenges ahead

“I want you to facilitate delivery of a sustainable energy system” – defining the solutions for decarbonising heat, providing the costs and implications for consumers, to support a pathway that minimises disruption.

“I want an affordable energy bill” – whole energy system collaboration offers networks the potential to respond to changing needs and reduce consumer costs. Focusing on delivering and embedding innovation to deliver the energy transition ensures the most effective long-term solutions are taken forward.

I want you to care for the environment and communities

“I want you to facilitate delivery of a sustainable energy system” – cutting greenhouse gas emissions reduces our impact on climate change, with clear benefits for society including improved air quality. Improving biodiversity and reconstructing the environment when we have demolished a site brings positive benefits to nature and communities.

“I want an affordable energy bill” – responsible demolition protects future consumers from the costs of disposing of assets they may not have benefited from whilst promoting environment net gain activities.

Meet the needs of consumers and network users

I want to connect to the transmission system

“I want to use energy as and when I want” – making it easier for new sources to connect, so diverse domestic and international sources of gas can access our network efficiently.

“I want you to facilitate delivery of a sustainable energy system” – make it easier for lower carbon biogas and gas-powered vehicle refuelling stations to connect, assisting decarbonisation with minimal disruption to consumers.

“I want an affordable energy bill” – where possible we provide capacity without building new assets, facilitating liquidity in the competitive wholesale energy markets which keeps costs low for consumers.

I want you to be efficient and affordable

“I want an affordable energy bill” – embedding efficiencies, focusing on the most efficient and effective solutions and reducing returns from day one of the new price control will keep costs down for consumers.

Uncertainty mechanisms ensure spend is directed at maximum consumer benefit even when circumstances change.

Facilitation of the wholesale market, has a positive impact on the wholesale energy cost for consumers. Balancing costs between current and future consumers ensures fairness.

I want all the information I need

“I want an affordable energy bill” – our information and insights provide value for consumers by ensuring that the gas market runs smoothly. It also promotes competition in the wholesale market.

6. What drives our costs?

RIIO-2 expenditure

To achieve the outcomes our stakeholders want and need, our draft proposals forecast our average annual total costs in RIIO-2 at £599m, (excluding pass through costs, potential customer triggered network reinforcement and real price effects) an increase from £403m in RIIO-1.

£352m (per year) of our totex plan for RIIO-2 relates to three areas of investment:

- expenditure to maintain reliability with many assets at the end of their technical design life
- expenditure to increase resilience by protecting the transmission network from rising cyber and physical security threats
- expenditure to meet emissions legislation compliance by 2030.

The proposed investment directly links to our commitment to maintain a world-class gas network that supplies gas when and where it's needed, while keeping our costs as low as possible, in a way that's both sustainable and safe.

We are also mindful that to meet this commitment, we must get the balance right between network reliability and the cost to consumers today and into the future. Within the changing energy landscape, we are managing an ageing network with many assets at the end of their design life. The decisions we make today have lasting impacts on cost, risk and the level of network capability we offer to stakeholders. The plan reduces network capability in the future due to decisions we are making now and we want to ensure these trade-offs are fully understood. We will consult further with you to discuss the implications of these plans to ensure our proposals meet your needs.

A summary of the key drivers and levels of investment, based on stakeholder feedback to date, is:

- **Managing an ageing network with many assets at the end of their design life (£178m pa).**

We're experiencing more condition-related issues. We have started to deal with these issues in RIIO-1 by investing £100m over our allowances. For RIIO-2, we have provided evidence that we will need to increase our spending to maintain the health of our assets. We have tested the deliverability of our plan in the long term over a 10-year period, applied efficiencies derived through our focus on enhancing our capability in RIIO-1 and will continue to deliver our works using native competition.

For asset health work on our compressor fleet, we will test to ensure our proposed investments meet your current and future network capability needs. As we move forward, our asset decisions will need to be assessed using this approach.

To deliver the network capability you need and to maintain asset health across our network, we are forecasting a need to maintain a similar level of cost as proposed for RIIO-2 to at least 2030.

- **Timely delivery of emissions legislation compliance by 2030 (£51m pa).** We have 28 compressor units that are subject to the Medium Combustion Plant Directive (MCPD) and we need to make decisions now on the solutions. Based on the network capability you have currently indicated that you need, we are proposing limiting new compressor installations to two in RIIO-2 and a further five in RIIO-3. For a further 21 compressor units we are exploring decommissioning and derogation solutions and will test this with you during the summer, before finalising our plans.
- **Protecting the transmission network from rising cyber and physical security threats (£123m pa).** We are working with the Department for Business, Energy & Industrial Strategy (BEIS), Ofgem in their joint role as competent authority, and with the Health and Safety Executive (HSE) to assess our existing cyber protection capability and confirm the further works that will be required to protect against these threats.

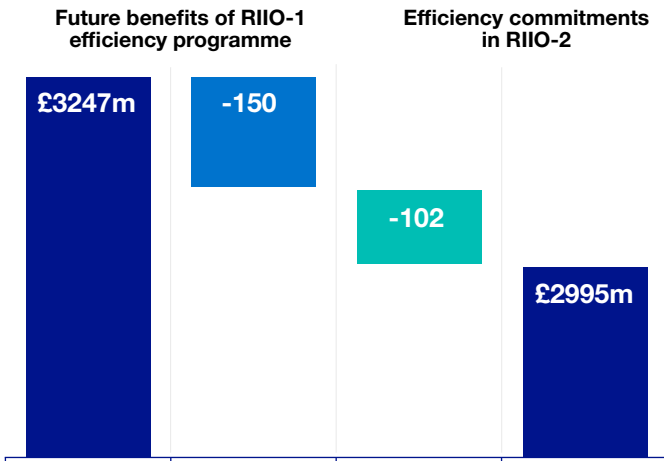
Being more efficient to deliver value for money

To deliver our proposals as cost-effectively as possible we have challenged ourselves to drive efficiencies across our activities. We have done this by:

- building in the future benefits of our stretching UK efficiency programme, **saving £150m** over the full RIIO-2 period
- making an ambitious commitment to further **reduce our operating costs by £22m**. This represents a further 5.6% improvement in our operating productivity by the end of RIIO-2, nearly three times the government's forecast of UK productivity growth. The outcome of our total operational cost efficiencies will mean our RIIO-2 costs are 13% lower by the end of the RIIO-2 period than today's level
- building in the benefits of our past successful engineering and asset management innovations to include a 4% efficiency on our direct capital investments, **saving £80m**.

What drives our costs? continued

Figure 5.1
Five year total efficiency benefits



In addition to the efficiency improvements and commitments we have applied, we have challenged ourselves to focus on the most effective and efficient activities that will deliver the network capability needs of our stakeholders. We have proposed a plan on future compressors over RIIO-2 and RIIO-3 that will result in the remaining 21 compressors being decommissioned or derogated at a cost that's significantly lower than replacing these units. This has the potential to **save consumers over £300m in RIIO-2 and £263m in RIIO-3.**

Overall, we are reducing the costs of delivering your priorities in RIIO-2 by **£552m.**

We are conscious that undertaking our activities effectively has a more far-reaching impact on consumer bills than the cost of our activities alone. By facilitating the effective functioning of the gas market we have a positive impact on the wholesale energy cost for consumers. This impact was supported by a recent study by EY. This concluded that even with perfect foresight and not taking account of an unexpected short-term shock, failure to maintain the existing capability of the NTS could have significant impacts on GB consumers, adding up to £877m per annum to electricity wholesale prices by 2035.

Financial framework

We have developed our business plan to deliver on our stakeholders' priorities and provide value for money. Part of this is ensuring that our draft plan balances the needs of investors with the needs of consumers today and into the future. Getting an appropriate financial framework which is transparent, robust and reflects the risks and long-term nature of the investments is vital in ensuring networks are able to fund future infrastructure efficiently and sustainably. Within our plan, we propose an appropriate base return due to shareholders (called the "cost of equity") which rewards them for the risk that they take in investing in a transmission business:

- we recognise that there are economic reasons why the cost of equity should be lower in the RIIO-2 period than it was in RIIO-1 but not to the extent Ofgem has indicated in their RIIO-2 Sector Specific Methodology document published in May.
- our plan assumes a base return of 5.5% which is consistent with our response to Ofgem's December 2018 RIIO-2 framework consultation, as this level of return better reflects the risks of running a transmission business and gives a more sustainable long-term risk/reward balance.
- the financial package we propose incentivises networks to innovate so we can deliver stakeholders' needs in the uncertain whole energy system transition.

We consider Ofgem's proposals for return are incorrect because they involve errors in the approach, arbitrary adjustments and the selective use of available evidence. Our assumption of 5.5% better reflects the risk of running a gas transmission business and provides a sustainable long-term risk/return balance. The base return we propose enables and encourages us to innovate to meet the huge challenges required to deliver the clean energy system of the future.

Use of an appropriate return is important to the resilience of the energy sector as a whole, but nowhere is it more pronounced than in transmission, where the uncertainty and complexity of investment required, and the scale and pace of market disruption is markedly higher than in other sectors. We have also seen growth in the cyber threat to our assets and the risk of political intervention in our operations over the last few years. These are risks which as a network we are best placed to manage because our customers and consumers do not have the ability to mitigate.

7. Our impact on energy bills

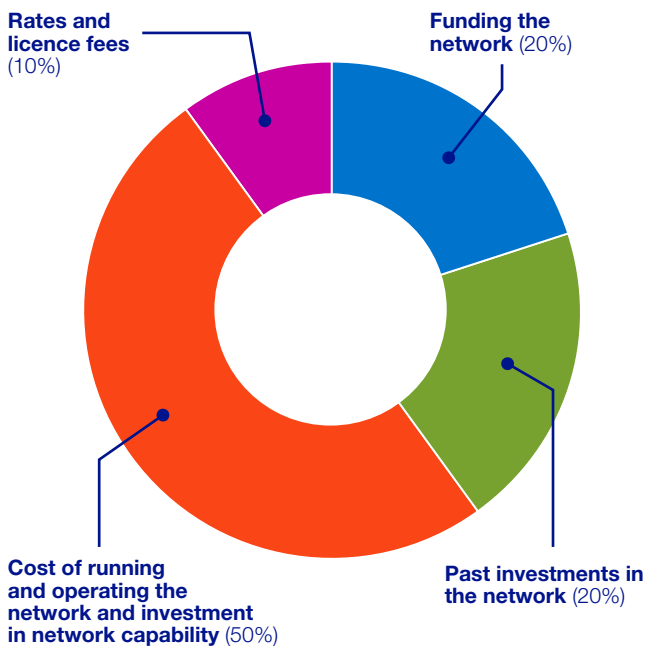
Our plan keeps our portion of a domestic end consumer's energy bill at or below £10 per year before inflation.

Whilst the increased expenditure required to deliver our RIIO-2 proposals brings an additional ~70p to the domestic end consumer bill, we can finance and make all the investments in our draft plan without increasing our part of the bill by:

- accepting a lower return from day one of the next price control period
- embedding savings in our underlying operating costs to reduce them by 13% from 2018 to 2026
- including 4% efficiency in our direct capital investments.

We will check our plan and its costs with domestic consumers through acceptability testing.

How our £10 per year portion of the domestic bill breaks down



Funding the network: upfront spend comes with an associated cost of raising funds, this is similar to the interest paid on a loan.

Past investments in the network: the cost of past investments in the gas networks is spread so consumers pay over the life of the assets. This portion relates to cost in prior regulatory periods.

Cost of running and operating the network and investment in network capability: the cost of work to deliver network capability within the current regulatory period is spread so consumers pay over the life of the assets. This also covers the day-to-day costs of running and operating a safe and reliable network.

Rates and licence fees: the obligatory charges that we have to pay in order to operate.

Ofgem has not finalised the financial model which will calculate revenue for RIIO-2 but using the figures set out in this plan, we estimate that our underlying revenue in RIIO-2 will be broadly flat compared to the average level in RIIO-1. There will be annual fluctuations from the underlying trend due to regulatory framework items such as uncertainty mechanisms and past investment adjustments. We are proposing changes to the framework, which will reduce these fluctuations, so for this draft plan we have focused on explaining the underlying revenue trends. The final framework will impact on the actual bill consumers and our customers incur. We are working with our customers and industrial and commercial consumers so they can understand the potential implications of the plan on them and we will provide further information once Ofgem has finalised the financial model to calculate revenues for RIIO-2.

Balancing costs between current and future consumers

Given the need for investment in RIIO-2 and beyond, and the changing future energy landscape in relation to gas usage as we decarbonise Great Britain's energy system, it is important we, and our regulator Ofgem, take account of the balance of cost that current and future consumers will pay. There are two areas of our plan which reflect our initial views in these areas for RIIO-2:

- Ofgem proposes a move to a new Consumer Prices Index (CPIH) metric for indexing our revenues, which will increase bills for today's consumers but lead to lower costs to consumers in the future. Whilst we are supportive of this change it should be neutral to consumers and investors and not be used as a tool to reduce the cost of equity for the transmission business, which should reflect the risks and long-term nature of the investments.
- To manage and recognise the uncertainty driven by the future transition to a net zero carbon economy we have proposed, and will consult further on, accelerated regulatory depreciation during RIIO-2. This is aimed at matching revenue with the usage of our assets and managing the potential risk to future consumers given the uncertainty linked to the energy transition.

8. Summary and next steps

We are confident our business plan is underpinned by solid foundations. We have embraced the new enhanced engagement arrangements introduced for RIIO-2 to thoroughly challenge and review our business plan. Already, this has brought significant improvements to the draft plan and we will continue to listen and act on the challenges as we build further versions. We have used techniques such as external benchmarking, engineering justification reports and cost-benefit-analysis (CBA) to make sure our plans are robust and we have built in efficiencies and benefits from innovation realised in RIIO-1. We have modelled key financial assumptions, including accelerated depreciation and asset lives and we are confident that our plan is deliverable across RIIO-2 and RIIO-3.

Next steps

This is our draft plan and builds on what we have heard from our February 2019 consultation on ‘shaping the gas transmission system of the future’.

- During the summer we want to talk to you again to make sure this plan delivers the network capability you need now and into the future. This process might change the draft plan content, the total cost and the impact on consumer and customer bills.
- We will be reflecting on Ofgem’s RIIO-2 decision document published in May 2019 and will set out more detail on incentives and other mechanisms Ofgem has proposed in our October draft plan.
- We will engage with you on the potential implications of the government’s commitment to Net Zero by 2050 and talk to you about the potential role and activities that we should include,

either in our plan or by ensuring the regulatory mechanisms around whole energy systems allow us to propose solutions for your long-term needs.

- We have identified that the proposed project at our Bacton terminal may meet the criteria of competition as defined by Ofgem in their May 2019 decision document. In addition, it is possible that the solution to reinforce the network in south Wales will meet the competition criteria if the customer progresses with this scheme. We will discuss these with Ofgem to decide how they should be taken forward.
- Once Ofgem has finalised the financial model to calculate revenues for RIIO-2, we will provide further information to help industrial and commercial consumers understand the potential implications of the plan on them.
- We will carry out nationally representative quantitative domestic consumer research to test whether our proposals hit the mark.
- We will continue the dialogue with you on our plan and will take comments on board for our next draft plan in October, alongside comments from our independent stakeholder user group and the RIIO-2 Challenge Group.

We welcome your continued input and feedback throughout 2019 to ensure this plan delivers for you now and into the future.

9. Our plan for assuring our final business plan

The board of National Grid Gas has been fully involved in developing this draft plan. For our final business plan in December we are planning for our board, including our sufficiently independent directors, to provide formal assurances on the quality of our plan. Board members of our parent company, National Grid plc, have also been involved in developing this draft plan. This page describes the assurance processes that we will follow for our final business plan in December.

Our plan uses accurate, high-quality information

We have in place a programme to make sure that our board members have the information and confidence they need to assure our final business plan.

We have a strong control and assurance culture built on the tough rules that apply to us such as the London Stockmarket listing rules, the UK's corporate governance code and the USA's Sarbanes-Oxley requirements for publicly-listed companies. Our RIIO-2 assurance plan builds on these strong existing assurance systems.

We have performed a full risk assessment of our RIIO-2 business plan and designed an assurance plan using the following three lines of assurance:

- business unit management
- internal independent team
- external or internal audit

We have engaged an external expert consultancy to independently review and advise us on our risk assessment and planned assurance approach and we will complete our assurance work for our final business plan in December.

The statements we will ask our Board to make on the final business plan

We are working towards providing our Board with the confidence to make statements in relation to the following areas:

- the board's ownership of the overall long-term strategy that underpins the plan.
- the quality of the underlying information.
- the quality of our cost forecasts, including how they are value for money.
- meeting our statutory and licence obligations.

Our National Grid gas transmission board members



Nicola Shaw
Chair



Phil Sheppard
Director Gas
Transmission



Chris Bennett
Director
Regulation



Alan Foster
Chief Financial
Officer



Fintan Slye
Director
System Operator



Dr Cathryn Ross
Sufficiently
independent director



Dr Clive Elphick
Sufficiently
independent director



Alexandra Lewis
Treasurer

10. How our draft plan maps to Ofgem's business plan guidance

We have built our draft business plan around your key stakeholder priorities. Our regulator, Ofgem, will be assessing our final business plan against guidance it issued on 3 June 2019. We will reflect this guidance in our October draft plan, but in the meantime the table below shows how this draft plan maps to Ofgem's guidance.

No.	Ofgem assessment criteria	Location of our evidence
1	Track record	Each of our stakeholder priority chapters includes a summary of our current performance. Please also see our RIIO-2 challenge group response and our annual RPP reports.
2	Business plan commitment	Chapter 9 – how we will assure our final business plan.
3	Giving consumers a stronger voice	Chapter 20 – creating a stakeholder-led plan. Annexes on independent stakeholder user group set up, stakeholder strategy and engagement report. Each of our stakeholder priority chapters explains what our stakeholders have told us and any relevant engagement logs.
4	Meet the needs of consumers and network users	Each of our stakeholder priority chapters explains our proposals for network users and consumer benefits. Chapter 26 – I want all the information I need to run my business, and to understand what you do and why Chapter 27 – I want to connect to the transmission system
5	Maintain a safe and resilient network	Chapter 21 – I want the gas transmission system to be safe. Chapter 22 – I want to take gas on and off the transmission system where and when I want Chapter 23 – I want you to protect the transmission system from cyber and external threats.
6	Deliver an environmentally sustainable network	Chapter 24 – I want you to care about the environment and communities. Chapter 25 – I want you to facilitate the whole energy system of the future – innovating to meet the challenges ahead.
7	Enabling whole system solutions	Chapter 25 – I want you to facilitate the whole system of the future – innovating to meet the challenges ahead.
8	Managing uncertainty	Each of our stakeholder priority chapters includes how we manage risk and uncertainty. Annex on uncertainty mechanisms.
9	Innovation	Chapter 25 – I want you to facilitate the whole system of the future – innovating to meet the challenges ahead.
10	Competition	Chapter 28 – our plan is efficient and affordable, providing value for money
11	A consistent view of the future	Part 2 – context
12	Cost information	Chapter 30 – our plan is financeable. Business plan data templates. Investment decision pack, which includes our engineering justification reports and cost benefit analysis.
13	Financial information	Chapter 30 – our plan is financeable.

How to navigate our draft plan

Our draft business plan matters to people with a variety of different interests, including consumers. We have written our draft business plan with our customers and industry stakeholders in mind and it will be reviewed by our independent stakeholder user group and the RIIO-2 challenge group.

Part 1: Executive summary

This is a high-level outline of how we built our plan, what it delivers and the benefits it will deliver to consumers.

1. A message from our Chair	5
2. How we have delivered in RIIO-1	6
3. Building a stakeholder-led plan	7
4. Our draft proposals and costs for RIIO-2 at a glance	8
5. Consumer benefits	9
6. What drives our costs?	10
7. Our impact on energy bills	12
8. Summary and next steps	13
9. Our plan for assuring our final business plan	14
10. How our draft plan maps to Ofgem's business plan guidance	15

Part 2: Context

We describe the context and how this affects our plan.

11. The changing energy landscape	21
12. Challenges for existing network	22

Part 3: Approach to our RIIO-2 business plan

The principles we have built our plan on and how we will deliver the plan.

13. Core principles for our business planning	24
14. Network capability	25
15. Implications for our investments in RIIO-2	27
16. Areas of investments in line with Ofgem's output categories	28
17. How we will deliver our outputs efficiently	29
18. How our draft plan aligns with Citizens Advice's five principles	30

How to navigate our draft plan

Part 4: Our draft plan is built on stakeholder priorities

How we have built our plan and the detail of our proposals.

19. We are still working on our draft plan 32

20. Creating a stakeholder – led business plan 33

How we have used our engagement approach to build a truly stakeholder-led plan.

We show how we deliver your priorities through our proposals by following our 'Golden Thread' structure:

- What is this stakeholder priority about?
- Our activities and current performance
- What are our stakeholders telling us?
- Our proposals for RIIO-2 and how they will benefit consumers
- How will we deliver?
- Risk and uncertainty
- Our proposed costs for RIIO-2
- Next steps

We have linked our stakeholder priorities to Ofgem's proposed consumer focused outcomes as follows:

Maintain a safe and resilient network

21. I want the gas system to be safe 38

22. I want to take gas on and off the transmission system where and when I want 45

23. I want you to protect the transmission system from cyber and external threats 81

Deliver an environmentally sustainable network

24. I want you to care for the environment and communities 91

25. I want you to facilitate the whole energy system of the future – innovating to meet the challenges ahead 120

Meets the needs of consumers and network users

26. I want all the information I need to run my business, and to understand what you do and why 134

27. I want to connect to the transmission system 140

Part 5: How we deliver our stakeholders' priorities

In this section we describe how our plan is supported, because we are committed to providing robust justification that evidences our planned investment. This evidence is referenced within the main document, and full details are included in the appendices.

28. Our plan is efficient and affordable, providing value for money 150

29. Summary of our outputs and incentives 166

30. Our plan is financeable 171

31. Assumptions 181

32. Glossary 187

How to navigate our plan

Annexes

Annexes – our draft business plan is supported by the following annexes:

- Independent stakeholder user group set-up report
- Stakeholder strategy
- Network capability reports
- National Grid UK cyber security strategy
- Compressor emissions compliance strategy
- Environmental action plan
- Ethical procurement action plan
- Environmental and supply chain sustainability benchmarking
- NG environment BMS
- Environmental management system
- Innovation strategy
- Sustainable workforce strategy
- IT investment plan
- Output delivery incentives, price control deliverables and uncertainty mechanisms
- Finance
- Real price effects and future efficiency
- Willingness to Pay
- EY report
- Golden threads

Our stakeholder priority chapters are also supported by:

- Engagement logs – explaining the stakeholder and consumer engagement we have carried out for each of our stakeholder priorities
- Cost-benefit-analysis and engineering justification reports – these reports explain in detail the need for and the benefits of the investment we are proposing in each area.



Part 2

Context



Despite significant and rapid change in the energy sector, we and our stakeholders believe that gas will continue playing a significant role in all Future Energy Scenarios⁶ during the transition to decarbonise the GB energy system by 2050. And while gas is needed, consumers will require a gas transmission system that is safe, reliable, resilient, clean and affordable.

In building our plan we have used scenarios and forecasts to understand the drivers for investment. The Future Energy Scenarios (FES) publication sets out a view of plausible futures for the energy transition. This, with stakeholder views gathered by network companies, was the starting point for the cross-sector work to develop a “consistent view of the future”⁷ upon which our plan is based.

Because no decisions have been made yet about which pathway the transition will take, we have engaged extensively with stakeholders so we can understand your priorities to inform our business plan.

We set out:

- the **changing energy landscape**, particularly how gas is supplied, the changing requirements of consumers and customers, and our priorities for reducing emissions
- the **challenges to the network** emerging from these changes, in conjunction with the state of our ageing assets

⁶ <http://fes.nationalgrid.com/fes-document/>

⁷ <http://www.energynetworks.org/news/publications/reports/>

11. The changing energy landscape

Future changes in the energy sector towards a low-carbon future will have significant implications for our business. There are three key areas where we expect change:

- the long-term role of gas in the transition towards a low-carbon future;
- how gas is sourced, transported and used in GB;
- legislative changes relevant to energy networks.

Long-term role of gas

In the transition to a low-carbon future, no-one yet knows the pathway GB will take to decarbonise energy to provide clean heat, nor how long it will take to achieve. So there is a wide range of different projections for the rate of change in how gas will be used, where and how gas will enter and exit the network, and what types of gas will flow.

Nonetheless, informed by our stakeholder engagement, we understand that:

- there is a long-term need for the gas transmission network in delivering the energy transition. Under all Future Energy Scenarios gas, in varying forms, will be used until at least 2045
- preserving capability and flexibility in the transmission network keeps options open and reduces the long-term uncertainty risk at minimal cost, while also ensuring the GB energy supply is secure now and in the future
- the role of gas is expected to change with decarbonisation, decentralisation and digitisation.

On **decarbonisation**, setting a 2050 net zero carbon emissions target is the right ambition and there must be a clear policy framework to make it a reality. The next decade towards 2030 is vital and the decisions we take today will pave the way to a new energy era. Emissions from heat delivered by natural gas are the single biggest contributor to UK emissions at 37%⁸. As per the Committee on Climate Change (CCC) report, we need to see much greater progress in making areas like heat and transport cleaner, with both government and industry stepping up action. Gas can support a fair transition to low-carbon power, heat, industry and transport and play a key role in meeting the GB environmental targets. The current average unit rate of gas per kWh is 10p lower than electricity⁹.

Gas supports decarbonisation in:

- **Generation:** Gas generation through combined cycle gas turbines (CCGTs) provides a reliable and flexible way to support intermittent electricity renewables and is a viable alternative to coal. Currently, on average, 40% of the UK's electricity supply is generated using gas.
- **Heat:** Around 80% of UK homes are heated by gas. Gas can help decarbonise heat at lowest cost and disruption to consumers (especially those who are vulnerable), whether that's natural gas or biogases such as biomethane and/or hydrogen.
- **Transport:** Commercial vehicles, especially heavy goods vehicles, could use biogases, natural gas or hydrogen to achieve air quality improvements when compared to diesel. Doing so would complement the uptake in domestic electric vehicles, and it could reduce the need for upgrades in network infrastructure by making effective use of the existing gas and electricity networks.
- **Industry:** The network provides options for hydrogen and carbon capture usage and storage, as well as a way to employ other renewable sources of gas for industry to use to help decarbonise.

On **decentralisation**, consumer behaviour is changing, and more consumers are making choices about where they want their energy from. Inevitably, this is creating a more decentralised energy route and generation is becoming more embedded within distribution networks. Suppliers of alternative sources of gas, such as biomethane, are looking at whether to connect to a distribution or transmission network. This will mean that a more holistic, coordinated approach to energy planning and operation will be required going forwards. Whole system solutions will become more the 'norm'. We, as the gas transmission system operator (TSO), are in a unique position to help drive debate and collaborative action across the energy sector.

Digitisation is making the world more connected. There are constant advances in digital and other technology, which can bring both benefits and challenges to consumers and networks. If we are to respond to change effectively, we must invest and improve our digital systems during RII0-2. This investment will bring benefits to consumers; using technology more will mean we can reduce costs and improve our services to customers.

⁸ BEIS - Clean Growth - Transforming Heating https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/766109/decarbonising-heating.pdf

⁹ https://www.ukpower.co.uk/home_energy/tariffs-per-unit-kwh

The changing energy landscape continued

How gas is sourced, transported and used

We've experienced dramatic changes in the pattern of gas supply in Great Britain over the past 15 years. From being self-sufficient in 2000, GB is now dependent on imported gas for around half its needs. Additionally, growing renewable generation will lead to gas-fired generation being needed increasingly often to support intermittent electricity.

As these trends develop, this leads to significant uncertainty in the future in three areas.

- The **volume and type of gas** expected to flow through the transmission network.
- **Where, when and how gas will be injected into** the transmission network.
- **Where, when and how gas will be taken off** the transmission network.

The effects of this underlying uncertainty have been observed over the past 15 years. For example, while the aggregate volume of gas consumed over a year has gradually declined, we have seen peak volumes of gas (at a single point of time) remaining broadly constant.

Taken together, this affects the location of *where* gas is sourced and consumed, as well as the timings of *when* gas is sourced and consumed. These changes are already creating new operability challenges – for example, shippers are increasingly changing where and when to flow gas on and off the network – and we expect these challenges to grow in the years ahead. We are doing extensive work to understand whether our network can withstand the changing use of gas and, if it can't, what the consequences might be. Our preliminary analysis, including our recent study by EY (annex A11.01), shows the capability of our network has significant impacts on GB wholesale energy costs: it facilitates diversity in supply sources, and it enables gas-fired generation to mitigate the effects of more intermittent renewable electricity generation.

Legislative changes

Energy has always been, and will continue to be, vital to GB's economic and social interests. Towards the low-carbon future, several pieces of legislation have been introduced with regards to emissions as well as cyber and physical security.

On **air quality emissions**, legislation has been introduced to encourage a reduction in NO_x and CO₂ to a safe level. This tightening emissions legislation affects our fleet of gas compressors and our response to this legislation forms part of our business plan for RIIO-2, as it has done during RIIO-1. We discuss this in more detail in the chapter 'I want you to care for the environment and communities.'

On **cyber and physical security legislation**, our network is a critical part of the energy industry and is specified as critical national infrastructure (CNI) by the government and wider stakeholders. We therefore have to make a range of investments in physical and cyber security to comply with the legislation that is applicable to our network. Our approach on physical security is in line with the information and guidance published by the Centre for the Protection of National Infrastructure (CPNI). The Security of Network and Information Systems (NIS) regulations came into effect in the UK on 10 May 2018. They aim to minimise the risk of cyber-attack and the resulting impact on UK CNI and the economy.

During RIIO-2, we will meet the needs of government and wider stakeholders on both cyber and physical security. You'll find more information about how we plan to do this in the chapter 'I want you to protect the system from cyber and external threats.'

12. Challenges for the existing network

The age and use of our critical infrastructure mean **our assets now require greater care**, increased monitoring, refurbishment and replacement to maintain a safe and reliable transmission system. For example, 70% of our site assets will be more than 40 years old at the end of RIIO-1 and we are observing more condition-related issues across these sites. We must address these to ensure we can deliver the services you require in the most efficient and affordable way.

The decisions we make now will have long-term implications, so we need to ensure our investment proposals are supported by robust cost-benefit-analysis against a range of credible future energy scenarios, so we make informed choices for consumers today and in the future.



Part 3

Approach to our RIIO-2 business plan



This chapter sets out our approach to our business plan and how we will balance the factors and trade-offs we've highlighted to guide the investments required.

We explain in this chapter:

- The **core principles** underpinning our planning. These help us test that we are only spending on areas that deliver real consumer value, and that we spend the money at the right time.
- Our work on defining **network capability**.
- The **implications for our draft RIIO-2 business plan** given the external context and stakeholder views, and the factors we need to balance when making investment choices.
- How our **areas of investment** deliver Ofgem's output categories, stakeholder priorities and the challenging external context.
- Our commitment to maximise **efficiency and affordability** for consumers, and our plans to continue innovating to improve efficiency.

13. Core principles for our business planning

For each area of our plan, we have applied three core principles to ensure that our plan is optimal.

Our three core principles are:

- to ensure that each investment decision is made in the **interests of consumers** by investing only where and when needed .
- **stakeholder engagement**, which will continue throughout our business planning, to account for any evolving requirements and ensure the timings of investments are optimal. See the 'creating a stakeholder-led plan' chapter for more detail.
- **cost efficiency**, minimising the impact on consumer bills for current and future consumers. We expand on this in the chapter 'I want you to be efficient and affordable'.

These core principles inform the cost-benefit-analysis¹⁰ ('CBA') for each investment to explore whether it is required and, if it is, when costs should be incurred to maximise consumer value.

¹⁰These CBAs inform our engineering justification reports for our business plan. For the compressor investments, the CBA approach is contained in the Compressor Emissions Compliance Strategy.

14. Network capability

Defining the capability of the network

The capability of the network can be measured by its ability to accommodate levels of gas flows onto and off the network. The capability at any entry or exit point that can be delivered in any day will differ depending on the specific situation on the day. This will include the local and national balance between supply and demand, the existing level of gas in the network, the profiles of gas coming on and off the network and the assets available at the time.

The existing network has been designed to meet peak demand requirements by moving the necessary quantity of gas around the network. This is in line with our licence obligation to have a network that meets the peak demand experienced in an exceptional winter, calculated as occurring once in every twenty years.

It's important that we minimise the costs to consumers, considering the impact on current and future consumers bills. Reducing network capability could:

- limit the ability of directly connected customers to operate their businesses as efficiently as possible
- limit access to the cheapest supply of gas, increasing wholesale gas prices
- reduce operational and maintenance costs.

Excess network capability could:

- result in unnecessary operating and maintenance costs
- create the risk of asset stranding increasing costs for consumers.

Our July draft business plan is designed to deliver the level of network capability we believe stakeholders require. Striking a balance on the costs of current and future consumers is covered in more detail in chapter 15.

Understanding stakeholder requirements

Since October 2017, we have undertaken a series of engagements to understand stakeholder requirements on the network now, and into the future. We have used a variety of communication channels from webinars and workshops to bilateral meetings and newsletter publications. This engagement has covered a cross section of our stakeholder universe. We have created a segmentation model to better understand our stakeholder specific requirements and ensure that we have achieved a representative contribution.

Our engagement to date has captured consumer representatives, traditional industry customers and a range of interest groups, research and development organisations. Topics have ranged from how we shape the future of the network, to how we manage the environmental impacts of operating the network, and consumer listening. Gas Future Operability Planning¹¹ (GFOP) has played an important role in this stakeholder engagement.

Calculating the capability of the network

We use a range of existing analysis tools to calculate network capability. We compare the physical capability with a wide range of potential future flows using the Future Energy Scenarios (FES) analysis. By quantifying the requirements of our customers and comparing them with the ability of the network to meet them, we can identify areas where there is a potential mismatch between capability and requirements. We then explore options on the network to meet these requirements.

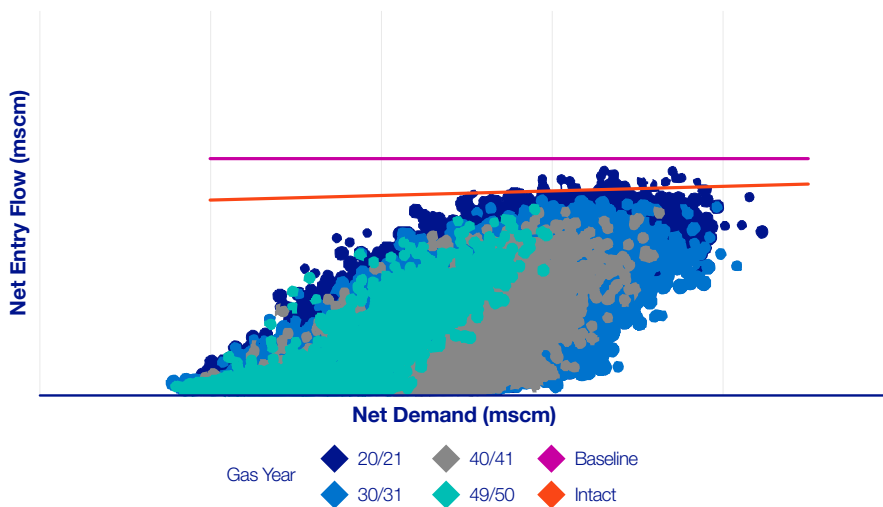
Table 14.1
Analysis undertaken to establish the capability of the network

	The July draft business plan takes account of or measures:	We intend to engage further on how we describe or measure:
Entry and exit flows	✓	✓
Pressure levels and ranges	✓	✓
Exceptional winter obligations	✓	✓
Long term supply and demand changes	✓	✓
Flow profiling	✓	✓
Asset data	✓	✓
Capacity baselines	✓	✓
Commercial arrangements	✓	✓
Boundary transfers	✓	✓
Environmental obligations	✓	✓
Customer driven changes to flows		✓

¹¹ <https://www.nationalgridgas.com/insight-and-innovation/gas-future-operability-planning-gfop>

Figure 14.2

An example of the metrics we have developed, showing supply and demand scenarios versus network capability from 2020-2050



Notes:

The purple line shows the capacity baseline for the entry point

The orange line shows the level of network capability with an intact network (i.e. all assets available)

The blue dots show different supply/demand combinations and required levels of net entry flow for four different gas years. This shows how requirements may change over time.

As a result of the analysis we have undertaken for our business plan we have developed some proposed metrics that show different levels of network capability, compared to supply and demand scenarios in four different years. An example of the metrics we have developed is shown above.

Future stakeholder engagement on network capability and capacity baselines

Between our July and our October draft submissions, we will be undertaking a series of stakeholder engagements on the topic of network capability and capacity baselines.

Our ‘capacity baselines’ are the levels of capacity that we must make available at each of the network entry and exit points on any given gas day. We’re obligated to make this available for sale. If we are unable to meet customers intended gas flows, where they hold firm capacity rights, we are required to provide compensation.

Our planned stakeholder engagement is intended to seek views on the appropriate level of network capability and capacity baselines for the RIIO-2 business plan. Our July business plan proposals may therefore change as a result of this engagement. Looking forward to our October draft submission, we will use this feedback to support our analysis. This will be a key input in defining our business plan proposal. Stakeholder feedback will also be used to support the development of the three reports¹² relating to network capability, that we are required to submit alongside the business plan. The draft versions of these reports can be found in annex A14.01.

To ensure our stakeholders see the value in supporting our engagement we have committed to sharing feedback that highlights how their inputs were considered in our options assessments.

Impact of network capability on our draft business plan

In our July draft business plan, our asset proposals are based on delivering the level of the network capability stakeholders need. In annex A14.01 we show metrics that represent how the physical capability of the network meets those needs. The work we need to do to manage those assets, can be broken down into the following categories:

- asset health
- environmental impact
- cyber resilience

The combination of ageing assets and new environmental legislation means we must make some important decisions in our RIIO-2 business plan, that will have long term implications on the level of network capability. This involves decisions around maintaining or reducing capability.

¹² An initial network capability report, a network capability target report and a baseline obligated capacities report.

15. Implications for our investments in RIIO-2

We need to support the move to a net zero carbon energy system by 2050, at the same time as delivering against our consumer and stakeholder priorities.

Robust and well-justified investments are needed to create the flexibility in network capability. This flexibility will be essential in meeting the future energy needs of consumers whilst enabling us to deliver your priorities. We must develop our business plans, clearly and in collaboration with you, our stakeholders, to ensure that the optimal investments are made at the right scale, the right place and the right time. This is also intended to avoid any overspend, as well as any under-investment that may jeopardise the use of gas by current and future consumers.

In doing so, we recognise that trade-offs exist, and that we need to get the balance right. For example, between:

- costs borne by **current vs future consumers** (for example, choosing not to invest now may lower the bills of current consumers but may impact the bills of future consumers by increasing the cost and/or risk incurred in the future).
- investing in **assets** to deliver gas to customers whenever and wherever they want vs **utilising commercial constraint management** tools when economic to do so. Our plans are based in part on the current regime continuing in its current form but if this were to change then the balance of some of our decisions may change.
- maintaining assets to **manage uncertainty** through providing optionality vs the risk of **asset stranding**.

The investments we propose to make in light of these trade-offs are discussed in our stakeholder priority chapters supported by separate engineering justification reports. This overall investment strategy is summarised in the table below.

Strategy	What this means...
Respond to immediate and future uncertain needs with 'no regret' investment	Do the things we need to do to keep the network safe and protected (e.g. investment in cyber security, which has a relatively short asset life). Maintain the health of our assets to facilitate an efficient gas market, reducing consumer energy costs and keeping the public safe.
Maintain options for future use of the network	Maintaining the pipeline network to keep options open. The uncertainty, environmental impact and cost means there is rarely a strong economic rationale for decommissioning pipelines.
Optimise approach to long-term network capability decline	Accommodating reduced future network capability by choosing not to replace like-for-like all compressors that will breach the emission limits from 2030 onwards, although it may limit future flexibility.

We set out our approach to the RIIO-2 business plan in more detail in the next chapter.

16. Areas of investments in line with Ofgem’s output categories

Our stakeholder priorities influence everything we do. They have shaped our entire planning process and we have structured this plan to address each of these eight stakeholder priorities in turn. Ofgem has set out three areas of outputs for us to deliver. These are:

- maintain a safe and resilient network.
- deliver an environmentally sustainable network.
- meet the needs of consumers and network users.

These complement the stakeholder priorities. For example, addressing the priority “I want you to care for communities and the environment” will require outputs in all three of Ofgem’s categories. Ultimately, these overlaps arise as most decisions to maintain network safety and resilience, and deliver an environmentally sustainable network, must be driven by the needs of consumers and customers. In this context, we assess each investment from a consumer value perspective. The following table shows the potential overlaps with investment areas, and the primary investment area where the stakeholder priority is discussed and costs have been allocated:

No.		Maintain a safe and resilient network	Deliver an environmentally sustainable network	Meet the needs of consumers and network users
1	I want the gas system to be safe	Primary		Overlap
2	I want to take gas on and off the transmission system where and when I want	Primary	Overlap	Overlap
3	I want you to protect the transmission system from cyber and external threats	Primary	Overlap	Overlap
4	I want you to care for the environment and communities	Overlap	Primary	Overlap
5	I want you to facilitate the whole energy system of the future – innovating to meet the challenges ahead	Overlap	Primary	Overlap
6	I want all the information I need to run my business, and to understand what you do and why			Primary
7	I want to connect to the transmission system	Overlap	Overlap	Primary
8	I want you to be efficient and affordable	Primary	Primary	Primary

 primary area where stakeholder priority is discussed

 overlap area where stakeholder priority is discussed

17. How we will deliver our outputs efficiently

Efficient planning and delivery of investments helps to keep consumer bills down. Our draft plan includes details of how we will deliver efficiently, and how we'll continue to look for ways to increase efficiency and reduce consumer bills through:

- outputs and incentives
- efficient financing
- uncertainty and risk

Through our RIIO-2 price control process, we also intend to set out clear **outputs and incentives** upfront, so that we will be incentivised to outperform on our targets as well as to be held accountable to do so. These outputs are a mix of licence obligations, price control deliverables (funded through our "baseline" revenues), and output delivery incentives in areas where we should set ambitions to outperform to share successes with consumers. We are currently working on our bespoke outputs with the stakeholder user group. We discuss this further in '**Summary of our outputs and incentives**'.

To deliver the investments required to achieve the stakeholder priorities, we have set out our plans to **finance our investments as efficiently as possible**. This involves developing a proposed financial package that seeks to fund our investments at the lowest rate possible for an efficient, financeable company (i.e. one that can maintain an investment-grade credit rating). Recognising that some financial elements are outside of our control, this includes several mechanisms to ensure that any additional benefits or cost to us will be shared with consumers. We discuss this further in '**Our plan is financeable**'.

There will inevitably be some **uncertainty** about our activities and the associated costs because of the duration of the price control and the fast-changing energy landscape. This uncertainty will be shared by our customers and it could affect consumer bills so we are working with Ofgem on ways to manage it. We have proposed a series of uncertainty mechanisms to adjust the amount we earn for each year in the price control. We cover these plans in '**Summary of our outputs and incentives**'.



18. How our draft plan aligns with Citizens Advice's five principles

Citizens Advice is the official representative for energy consumers in Great Britain and it has designed five principles that we must meet for RIIO-2 to really deliver for consumers. This chart summarises how our draft plan maps to the five principles.

No.	Citizens Advice principle	How our draft plan aligns with the principle
1	Profits are lower than the previous price control, to more accurately reflect the relative low risk for investors in this sector.	We are proposing a lower base return in the RIIO-2 period lowering profits from RIIO-1. Our proposals reflect the risks associated with our business.
2	The value of any unspent funding for infrastructure projects is returned to consumers promptly and in full.	We are proposing many measurable outputs in our draft business plan. If we don't deliver an output and there's no good reason, we will return the money to consumers.
3	Industry business plans and regulatory decisions are directly informed by consumer (including future consumer) feedback and research.	We have built our draft business plan around our stakeholders' eight priorities and our consumers' three priorities to make sure it reflects them. We will involve our stakeholders, including consumer representatives, in annual updates so it continues to meet consumer need.
4	Companies are required to publish complete information on their performance, financial structures, gearing and ownership.	We report a lot of information on our performance to financial markets and our regulator. In future we will clearly show the link between what we deliver for consumers and our financial rewards. Our independent stakeholder user group will challenge us on the quality of our annual reports.
5	Innovation funding and incentives support consumers in the transition to a low-carbon future, particularly those consumers in vulnerable circumstances.	We will focus on innovation in a number of areas to reduce carbon emissions. We are also focusing our innovation on reducing costs for consumers in the medium term, such as applying new digital technologies to our network.