Gas
Transmission

Impact report
2021/22

Contents

Welcome to our 2022 Impact report

It is a pleasure to introduce a publication that isn't an obligation in any sense, but is a product of our partnership with stakeholders: you have asked us to deliver on your stated priorities, and to show how we have done it – and we are passionate about being transparent and providing this update to you.

The crossroads of our energy future is an exciting place to be, both for the wider industry and our own business; the past year has brought some of the greatest challenges and opportunities we have ever seen.

One of the greatest opportunities is the prospect of becoming a stand-alone gas business. In March, National Grid Group announced the acquisition of a 60% equity stake in our gas business by the consortium comprising Macquarie Asset Management and British Columbia Investment Management Corporation. We expect the transition to complete by the end of this year.

We're delighted that the consortium recognise that the gas National Transmission System will play a leading role in the UK's energy transition. Their significant investment will also support the expansion of hydrogen's role in the energy mix to deliver a competitive edge to the UK and its industry, while working with the UK Government and Ofgem to maintain security of supply.

At the same time we are mindful of the difficulties consumers are facing this winter, and we are determined to keep our impact on energy bills as low as possible. The portion of the consumer bill attributable to National Grid Gas was around £7.30, a decrease compared to the year ending March 2021 where the corresponding figure was £7.72. This reduction is driven by changes in the overall gas demand and the level of exit transmission charges.

Our impact report has some fantastic case studies on progressing the priorities you've identified, and how they happen at an individual project level. You will find much more in the report, but to take just a handful of examples:

- **Infrastructure development:** We have progressed with the development of major projects at Bacton and King's Lynn, using the first year of the price control period to refine our options and scope of works for delivery in subsequent RIIO-2 years
- **Russia/Ukraine:** Our employees have been shocked and saddened by the recent events in Ukraine and we wanted to offer our support to our counterparts in the Ukrainian energy sector. This spring, we mobilised a 'Help for Ukraine taskforce', in collaboration with the gas distribution networks (GDNs), Ofgem and BEIS, to coordinate donations of critical materials and equipment required totalling around £274k to keep the gas flowing. We hope that our action can help restore some of the infrastructure required to reinstate warmth and power, and we will continue to offer our skills and knowledge however we can
- **Innovation:** In 2021/22 we have continued to focus on innovation, with a particular emphasis on projects that can facilitate net zero
- **Charging:** Under the difficult circumstances of high energy prices, we are doing everything that we can to help support our customers. An example of this is with our Transmission charges that came into effect in October 2021, we deferred £45m of revenue to reduce charges for that year and to smooth out charge levels over future years. We also raised a modification proposal that was subsequently implemented to mitigate the revenue volatility related to Transmission charges
- **Hydrogen:** Project Union is our flagship project which explores transitioning to a 100% hydrogen transmission system. Specifically, by repurposing existing transmission pipelines through a phased approach. A circa 2,000km hydrogen backbone would be created, representing around 25% of the UK's current natural gas transmission pipelines by the early 2030s. The next steps are to undertake feasibility studies to inform the requirements of developing Project Union.

> " We are mindful of the difficulties consumers are facing this winter, and we are determined to keep our impact on energy bills as low as possible."

We understand the importance of good stewardship of the country's gas network. We are focused on delivering crucial investments to the network – fulfilling our requirements and going beyond them wherever possible. Our objective is to deliver a reliable, fit for purpose network that maximises efficiency and gives our customers what they need.

As always, we welcome feedback – we very much see this publication as the start of a conversation and part of our continued commitment to engage in open dialogue with our stakeholders. If you have any views on what you read here, please contact our team via: jennifer.pemberton@nationalgrid.com

Jon Butterworth
Chief Executive Officer,
Gas Transmission

Our Independent User Group
is helping to shape our business

Set up in 2018 to support the RIIO-2 enhanced engagement approach, we have worked with the members on transitioning the role of the group towards business as usual activity, including:

1. Scrutinising and challenging company periodic business plans
2. Monitoring, interrogating and enhancing transparency of performance against commitments
3. Acting as a critical friend for strategy, culture and processes in key areas.

In the first year of RIIO-2, the group has met 5 times and have raised 62 recommendations across 10 topics. These being:

- Net Zero and Innovation
- Responsible Business Report
- Network Capability
- Future of Gas
- Future St Fergus Terminal Strategy
- Overarching Stakeholder Engagement
- Digital Strategy
- Methane Emissions
- Charging Reform
- Our performance

Gas Transmission Independent User Group Members

Trisha McAuley OBE
IUG Chair

Lauren Jauss
RWE

Thibaut Cheret
Offshore Energy UK (OE UK)

Denise Massey
Energy Innovation Centre

Roz Bulleid
Green Alliance

Eddie Proffitt
Major Energy Users Council

Zoe McLeod
Sustainability First

Paul Denniff
SGN

Julie Cox
Energy UK

Campbell Murdoch
Total Energies

2021/22 at a glance

To shape the gas market of the future

	Impact
27 Strategic Innovation Fund (SIF) and Network Innovation Allowance (NIA) Projects	Building critical knowledge and evidence to support all energy networks transition to Net Zero.
48 innovation partners	Collaboration across the sector ensures no duplication of effort whilst delivering greater outcomes for UK PLC.
£1.1m Strategic Innovation Funding (SIF) awarded	Demonstrates a significant investment in the future of the NTS and the role it can play in a net zero future.
3 hydrogen connection enquiries	Demonstrates increasing interest in a hydrogen world.
91 repurposed assets make up the FutureGrid test facility	Reusing decommissioned assets provides robust evidence whilst reducing our environmental impact.
50 days of hydrogen pressure testing have been conducted in asset pre-tests	Testing at FutureGrid will provide the evidence we need to develop the hydrogen network of the future.
8 regional programmes we are involved in	Working collaboratively to develop regional transition plans to deliver net zero.

To operate safely, reliably and flexibly

	Impact
0.11 Lost time injury frequency rate against a target of 0.10	We are keeping our people and the communities around us safe from harm.
100% reliability delivered	Our customers and consequently consumers experienced no gas supply interruption keeping homes warm and the lights on.

To deliver sustainable value for customers and stakeholders

	Impact
8.6 Customer Satisfaction score (CSAT) against a target of 8.5	Our focus on delivering customers needs is having an impact and our customers can see this.
0 we managed the network with zero constraints for our customers	Managing the system effectively to minimise constraints on the system saves customers and therefore consumers money.
0 days of changes to agreed outages while maintaining the NTS	Customers experienced no unplanned outages and therefore no interruption to their gas supply.
8.52 mcm/d (million cubic meters per day) average difference in our forecast accuracy versus the actual daily demand	Providing accurate forecasts helps our customers make more informed decisions, leading to a more efficient operation of the market and reduced costs to consumers.
2 mcm (million cubic meters) of gas required each day to balance the system	Our impact on the market is minimal, customers can rely on us to ensure a balanced gas system matching supply and demand to deliver maximum value for consumers.

To drive positive environmental and community impact

	Impact
6.8% reduction in CO_2 emissions from 2020/2021 **14.7%** increase in NO_x emissions from 2020/2021 **12%** reduction in methane emissions from 2020/2021	By working hard to reduce our emissions we are supporting the transition to net zero.
53 environmental incidents	By mitigating and learning from our incidents we will ensure our negative impact on the environment continues to reduce.
58% of our PCDs are progressing in line with plan (as at end Sept 2022)	By delivering against the deliverables we agreed with Ofgem we are ensuring the safe, reliable and efficient running of the NTS.

To invest in our people, grow our capability and value everyone's contribution

	Impact
70 employee enablement score **77%** workforce health and wellbeing index	Our employees make our business. Ensuring they have all the tools, knowledge and skills to deliver for our customers whilst being healthy and happy is critical.
28.9% diversity of our workforce	Diversity within any workforce delivers huge benefits. We have work to do in this area to ensure we meet the diversity targets we have set ourselves.
3x increase in responses to our job adverts	By increasing the reach of our job adverts we are accessing a much broader pool of candidates, gaining a richer response and enhancing the diversity of employees.

Our impact on consumer bills

£7.30 October 2022 **down from** **£7.72** March 2021

Document key

Price Control Deliverables (PCDs)

Glossary

For glossary of industry terms please see page 21

Strategic Stakeholder Priority 1

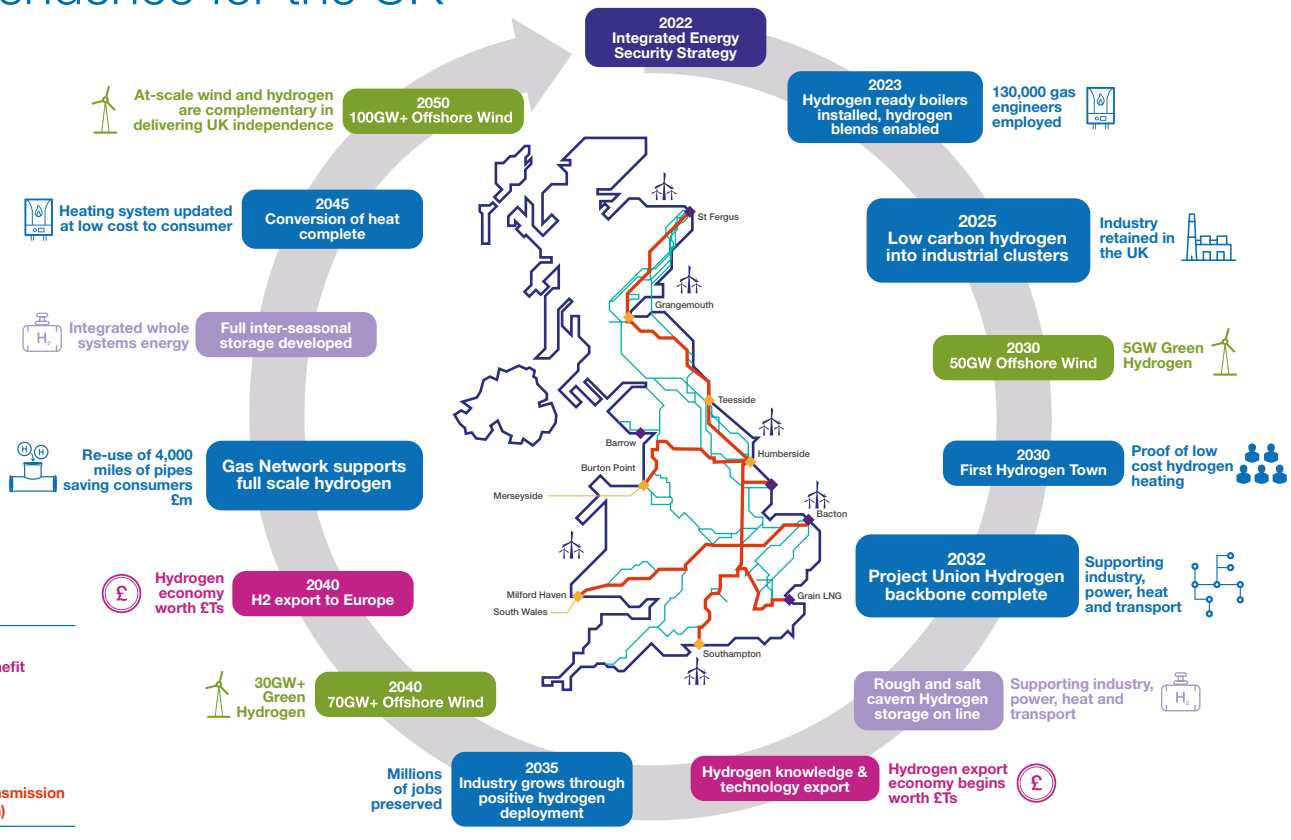
To shape the gas market of the future

We're at the centre of the energy markets of the future, working to secure and decarbonise UK supplies whilst leading the hydrogen transition

2021/22 performance dashboard

Number of NIA and SIF projects	**27**
Number of partners working with	**48**
£ SIF funding awarded	**£1.1m**
Number of hydrogen connection enquiries	**3**

Hydrogen roadmap: delivering clean energy independence for the UK



FutureGrid: Providing the evidence for the hydrogen network of the future

Our FutureGrid project is the first of many steps towards a full-scale conversion of the existing National Transmission System (NTS) to transport hydrogen. The project involves constructing a test facility from decommissioned assets that will be used to carry out a wide range of hydrogen tests in an offline environment, to demonstrate its effect on our assets, as well as the operation of our network.

Through rigorous testing, the FutureGrid project will allow us to gain an understanding of how the gas network will need to be developed and operated, to deliver sufficient quantities of hydrogen to our customers, as well as what impact transporting hydrogen has on the ongoing maintenance of pipelines and other components that make up the NTS. The aim of FutureGrid is to gain a full understanding of working with hydrogen, to develop processes and procedures – like those we currently have for natural gas – to allow us to run a safe and reliable national hydrogen network.

As you can see from the timeline, towards the end of 2022 we will be coming to the end of the construction of the facility. We will then begin preparing to commence testing in 2023.

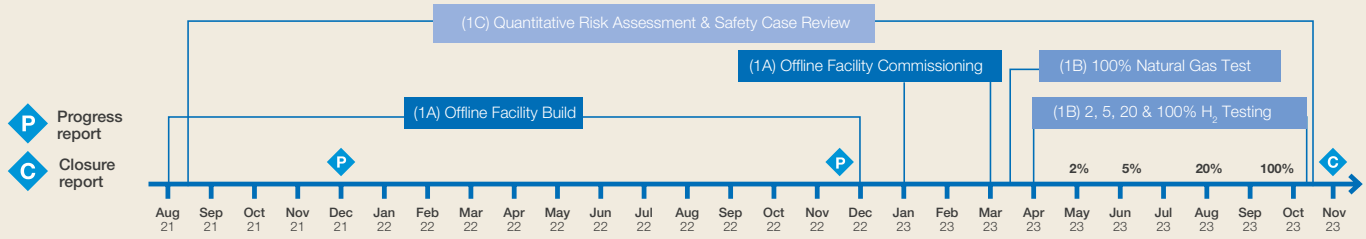
91
repurposed assets will be tested on the FutureGrid facility

50
days of hydrogen pressure testing have been conducted in asset pre-tests

3
the number of olympic size swimming pools it would take to fill the FutureGrid phase one site

Safety case

There is a fundamental difference between how natural gas and hydrogen behave. We need to understand how different concentrations of hydrogen impact our network so we can develop our safety standards. Through this project, we'll be able to assess the impact and update our safety case, indicating where we need to update procedures, quantitative risk assessments, hazardous areas and mitigating over-pressure risks.



To find out more about FutureGrid including FutureGrid Explore webinars and podcasts please **click here**

You can also follow the Innovation at National Grid page on LinkedIn to hear the latest news on the project and have your say **here**

Gas Transmission Innovation: driving the energy transition

Our overall innovation portfolio for RIIO-2 looks at increasing the efficiency of our day-to-day maintenance and operational activities, as well as focusing on projects that will help us reach the target of net zero by 2050.

The innovation funding mechanisms available allow us to take greater risks, with potentially higher payback. Our strategy considers the various funding mechanisms, and which of these will provide the best route to ensure greater benefits are realised for consumers.

Ofgem incentive funding; Network Innovation Allowance (NIA) and Strategic Innovation Fund (SIF); in RIIO-2 has enabled the continued development of our knowledge and evidence for the deployment of hydrogen and other net zero solutions on the gas transmission network. Whilst the additional use of other external funding (such as from Engineering physical sciences research council, EPSRC) has enabled us to drive forward our more speculative ambitious options for the future transmission system.

We have £31m of NIA funding available over the RIIO-2 period and the opportunity to attain a portion of £450m SIF funding.

The SIF funding process is a new funding mechanism we have actively engaged in with UK Research and Innovation (UKRI) and Ofgem.

Supporting other network projects is vital to prevent duplication, ensure shared learning and improve network collaboration across the whole system.

We are keen to further develop our stakeholder engagement ensuring that we maintain the level of ambition in the projects we progress and identify opportunities that will drive value for the UK consumer. To follow our activities **click here**

To find out more and access the innovation annual report **click here**

SIF projects are split into three phases:

Discovery – Feasability studies (2 months)

In the first challenge round (Nov 2021) we attained funding for 10 discovery phase projects led by GT (working with partners), with funding totalling £1.1m and we supported 8 other network projects. Our partners include: NGN, Centrica, Mott Mcdonald and others.

Alpha – Detailed Design (6 months)

4 GT led projects were carried through to the Alpha phase with a further £2.1m of funding attained in May 2022 whilst we continued to support 7 other network projects. Our partners include: Rosen, XoServe, Cadent and others.

Beta – Demonstration (>1yr)

We will be applying for funding in 2023 for Beta projects – successful projects that are able to carry out large-scale demonstrations of their technologies

The next challenge round is open and we have recently (November) applied for funding for a number of projects

Further info on all our projects can be found **here**

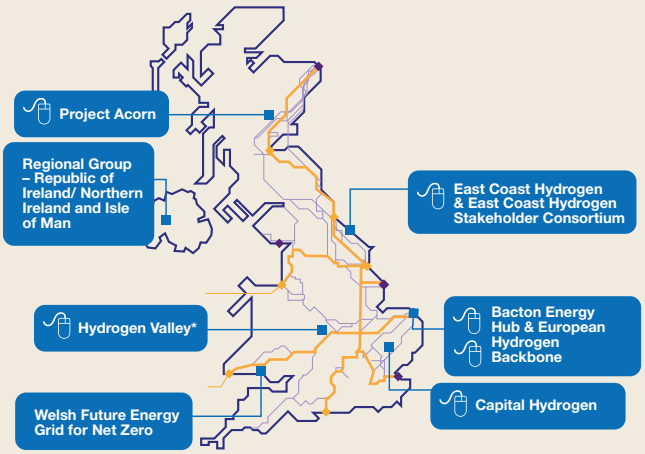
Transitioning to Hydrogen

Project Union

Project Union will connect hydrogen production, storage and demand to transition to net zero and enable a UK hydrogen economy. Repurposing existing transmission pipelines will create a low-cost hydrogen 'backbone' for the UK by the early 2030s and connect to the proposed European Hydrogen Backbone. It will deliver a programme of 'no-regrets' investments with supporting evidence to inform energy policy that will enable the UK Government to make progress in realising its hydrogen ambitions.

For the Project Union Launch Report **click here**

Regional projects



* website coming in December 2022

Hydrogen Blending into the NTS

We are undertaking a review of the current gas market framework, and what commercial and regulatory changes would be required to make blending onto the NTS feasible. Potential solutions will be explored based on the current assumptions we have regarding blending.

Two different blend injection techniques could be used, 1. Pre blending 2. In-network blending and the strategy may utilise either or both. The aim of this work is to develop a preferred commercial market strategy for blending on to the NTS ahead of BEIS making a decision and to also highlight the key focus areas where further work and data analysis is required to support that decision.

The four market framework areas that will require considerations when implementing Hydrogen blending are:

Connections **Charging** **Capacity** **System Operation**

We began internal engagement in July, bringing together a group of 6 experts from across Gas Transmission each with relevant experience in the key areas, along with physical asset and network configuration knowledge. This initial workgroup reviewed the assumptions outlined in terms of blending techniques and the types of connections available, in order to develop an understanding of how these processes may impact the current market regime and potential issues were recorded.

We are members of two Blending working groups under "ENA Gas Goes Green Pathway to Net Zero"

1. Capacity Allocation – Led by Cadent.
2. UNC, License and Regulation workgroup – Led by us (this is at the very early stages of development).

In relation to charging and system operations, we are continuing to work internally to assess the options and when this progresses we will share an update.

Collaborating across industry

How the gas landscape will evolve is uncertain. No single organisation can prepare for the future alone. We have brought together decision-makers from industry and societal interest groups so that the Gas Market Plan (GMaP) is focusing on the right areas of market change, at the right time, to maximise value for consumers.

The Gas Market Plan (GMaP) is a programme of work to proactively and strategically consider how market frameworks need to change across potential energy futures.

We undertake a variety of market-based projects to progress understanding in specific market topics and articulate where, when and what changes may be required to existing gas market arrangements to facilitate the net zero transition. Our focus areas are currently full hydrogen, blended hydrogen, and the future for natural gas.

Deliverables

GMaP deliverables completed in FY 2021/22 can be split into the following focus areas:

Hydrogen

- Developed a series of **scenarios** to explore the key events or triggers that could lead to market change
- Explored the potential market arrangements required to enable a **hydrogen town**
- Investigated the role a hydrogen **Guarantee of Origin** scheme could play in the development of a UK hydrogen market

Gas Quality

- Looked at how the market rules for changing gas quality limits at system entry points could be improved
- Created timelines for how the existing gas market frameworks could be changed to enable hydrogen blending

Balancing

- Investigated how the balancing arrangements within GB might need to adapt as we move through the energy transition.

GMaP deliverables to be completed in FY 2022/23 include:

- Explore the principles behind how **market frameworks** need to develop to enable the hydrogen transition (i.e. for 100% hydrogen, blending and the remaining natural gas market) and within the different relevant energy sectors (specifically power and industry)
- Undertake evidence based thought-pieces to inform areas of future UK Government policy
- Identify and explore potentially new areas where market arrangements might need to evolve.

hello hydrogen

An exciting campaign has recently been launched by many of the UK's leading gas supply chain organisations (including ourselves). The project will seek to engage the UK public on the role of hydrogen for heating in their homes.

Click **here** to find out more

Strategic Stakeholder Priority 2

To operate safely, reliably and flexibly

2

Doing the job we're here to do, running our business to the highest of standards, never compromising on our people's or customers' safety

2021/22 performance dashboard

	Target	Actual
LTIFR (Lost Time Injury Frequency Rate)	0.10	**0.11**
Reliability	100%	**100%**
PCDs **58%** progressing in line with plan*		

* As at end of Sept 2022

Shaping the Bacton Terminal Strategy

Delivering customers' needs, a safe, reliable and flexible terminal

Supporting our customers to deliver increased flows to Europe

The Bacton terminal provides up to 30% of GBs gas supply from the UK Continental shelf and via interconnectors from Europe.

The global situation has led to significantly higher flows than normal through the Interconnectors into Europe and we are facilitating this as much as possible. We saw record and maximum exports on the gas interconnectors this summer and also record summer demand across the UK. This unusual flow activity has led to an increased amount of dust and liquids in the network. This has accelerated elements of our investment strategy to mitigate and manage these risks. We have also bolstered our winter preparedness activities with resilience risk assessments for each compressor station, winter readiness reporting and also colleague safety campaigns.

Our strategy seeks to manage overall terminal asset risk across RIIO-2 whilst our Future Operating Strategy is developed. This has two aspects:

- **Accelerated:** manages and mitigates the immediate risks at the site
- **Medium Term:** no regrets investments to manage asset integrity at the site whilst being compatible with all options under consideration through our Future Operating Strategy.

We've been engaging with Ofgem throughout to agree the use of existing regulatory submission windows to fund these investments.

Developing a long term solution for customers

Over the past 18 months, we've been working closely with our customers and the supply chain to ensure we deliver the interventions and investments required for today and tomorrow.

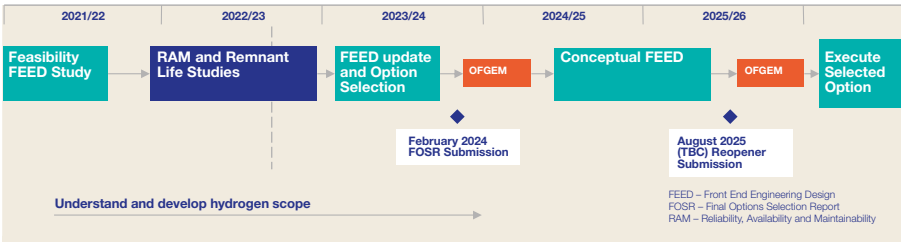
To develop the right investment plans we are firstly undertaking a robust condition assessment of the assets and pipework to understand what interventions are needed.

Secondly, we're working closely with customers and the Bacton Energy Hub to further understand the role Bacton Terminal can play in a net zero world.

Once established, we are expecting to put forward our methane proposals to Ofgem in early 2024.

We provide quarterly updates on this project, if you would like to join the distribution list please **register here**

Timeline



Shaping the St Fergus Terminal Strategy

Getting the right solution for customers and consumers today and tomorrow

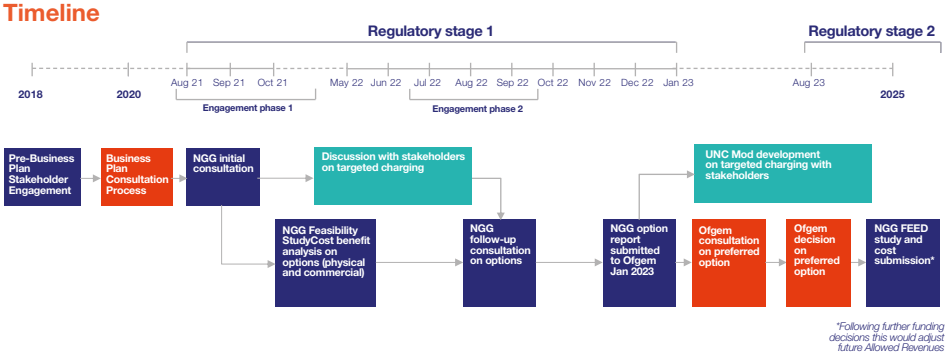
The St Fergus gas terminal, which accepts gas in from three sub-terminals, is currently one of the highest utilised sites on the NTS. With the introduction of emissions legislation in 2030, a number of compressors currently used at the NSMP sub terminal will become non-compliant.

The sub-terminal is of fundamental importance to the UK in that it provides flexibility, supports security of supply and access to UK Continental Shelf (UKCS) as well as Norwegian gas.

Over the past 18 months, we've been working closely with our stakeholders to understand their needs for the site. We've taken these and are developing a solution that will not only deliver these needs but also ensure the site is future proofed for hydrogen blends (a key piece of feedback from stakeholders). To date, we have held a consultation on charging arrangements and the preferred option.

We provide quarterly updates on this project, please **register here** if you would like to join the distribution list

Timeline



*Following further funding decisions this would adjust future Allowed Revenues

To find out more visit the St Fergus consultation website **click here**

Western Gas Network (WGN) Project

One of our customers has requested the ability to flow more gas through their LNG Terminal at South Hook. To accommodate this, we need to make changes to the National Transmission System by increasing its capability. This work is known as our Western Gas Network (WGN) project.

As the current geopolitical tensions continue to create uncertainty for global energy markets, the WGN project will play a role in the UK's future security of supply. How we achieve this increase in capability is important – construction has environmental and community impacts, and we need to ensure we deliver the work efficiently and responsibly whilst delivering value for consumers.

We've worked hard to reduce our impact on communities and the environment through the options we have chosen. Originally we expected the need for 37km of new pipeline and a new compressor station. However, through scoping and assessing options, we are now installing 11km of new pipe and are using pressure uprating of existing assets to reduce (as far as possible) the requirement for new build and therefore impact on the environment, and communities. It represents the best value for GB consumers.

The work involves:

- 9km of new pipeline between Wormington (Gloucestershire) and Honeybourne (Worcestershire) and 2km of new pipeline in Churchover (Warwickshire)
- Pressure uprating of the existing pipeline between Felindre (Swansea) and Three Cocks (Powys)
- Related works at existing Gas Transmission sites in South Wales and England to facilitate the pressure uprating, connection of new pipelines and effective compression at existing stations.

We're working hard to bring forward the date when the additional capacity will be available from Jan 2026 to Jan 2025 to align with the customers own investment programme. We're aiming to start construction in 2024 and are looking forward to working with our suppliers and contractors to continue to seek efficiencies, without compromise to quality or safety to deliver our project.

Our major projects and their drivers

	Emissions Reduction	Ageing Assets	Changing Customer Need	Secure Network
Compressor emissions programme	✓			
Terminal Redevelopment	✓	✓	✓	✓
Asset Health		✓		
Western Gas Network			✓	
HS2			✓	
Redundant Assets			✓	
Customer Connections & Diversions			✓	
Physical Security				✓
Cyber Security				✓

Exercise Degree

It is essential for the gas industry to be able to manage an emergency situation safely and effectively.

One of the ways we show our preparedness is through our annual emergency exercise. On a number of days during September and october we carried out our emergency exercise (Exercise Degree) which involved over 350 people from government agencies, regulators, lobby groups and major energy firms. During the exercise we simulate scenarios in which a loss of gas supply triggers an emergency situation for the UK's energy system. The exercise includes 'live play' from most supply and demand points on the NTS, and assesses the communication and response from each business.

Exercise degree was a massive success which also tested our new emergency protocols which come into place once the sale completes.

We will publish a Post Exercise report in December, which you will be able to see **here**

Strategic Stakeholder Priority 3

To deliver sustainable value for customers and stakeholders

3

We'll listen and respond to customers, to make sure we deliver what they need. We will do that with commerciality in mind.

2021/22 performance dashboard

	Target	Actual
CSAT	8.2	**8.6**
Minimising constraints on the NTS	0	**0**
Number of unplanned outages for our customers	11 days	**0 days**
Ensuring we can accurately forecast demands on the system	8.98 mcm/d average	**8.52 mcm/d average**
Balancing the system in the most cost effective way (number of million cubic meters of gas required each day to balance the system)	2.8mcm	**2 mcm**
Number of connections enquiries	–	**24**

Charging

As with the rest of the energy sector, and consumers, we have seen a significant increase in the cost of running our network. Whilst our operating costs have historically been very stable, this year along with everyone else, we have seen a significant price increase and due to our regulatory deal, these increases are passed through to our customers and consequently consumers.

It's important for us to be transparent and timely in our engagement on this topic and we began engaging with the market and specifically our customers in July, to share our predictions of charges over the next few years, to allow them to plan accordingly.

It became clear that we need to do something to reduce the impact of these charges on our customers and we are working to develop that. We spoke in July about the predictions and kept our customers and stakeholders updated. We have now been working to create some options around what we can do, and then we will assess which is the best option to present to the market with a view to changing the charging regime next year.

If you would like to be kept up to date on this topic **click here**

Code Modifications

We develop, negotiate and implement changes related to commercial contracts, notably the Uniform Network Code, which underpin the UK gas regime. Sometimes this can be difficult as we have many different stakeholder groups to keep engaged and the changes won't always be welcomed by all groups.

We received feedback from our Independent User Group (IUG) (the group's role was detailed at the start of this report) stating frustration with the code modification process; specifically, the process was perceived to be making changes last minute, without consultation and was challenging to understand the reasons for change.

We have responded to this and committed to make changes, some of which are outlined below:

- **Support stakeholder understanding** Implement exec summary template across all code modifications moving forward: articulating context, drivers for change, options considered (if any), risk of inaction and benefits of proposal
- **Plain English** All code modifications summaries will be written in a non-technical manner in an effort to deliver transparent and clear understanding for customers and stakeholders
- **Impact** All code modifications will include a consumer, customer and stakeholder impact assessment to ensure all implications are considered
- **Evidence** The new process (Customer & Stakeholder governance review/approval and targeted engagement) will be captured and evidenced moving forward; mitigating risk and giving opportunity for continued learning.

Listening and responding to our communities – HS2 diversion projects

6,954 Letters sent to residents (total)

47 Queries

8 Complaints (to date)

Occasionally we are required to divert our pipelines to make way for major infrastructure where it is safe and appropriate to do so. We are in the process of completing a number of diversions along the HS2 route.

We work collaboratively with all our stakeholders, including local communities to make sure that our projects have a minimal impact on the local area during construction. For example, during one of our HS2 diversions (TX35) our team demonstrated determination and flexibility to adapt its programme to address concerns from members of the public and political stakeholders. Their collective effort led to the reprogramming of works and investing in additional traffic management measures to ensure that the disruption in the area was kept to a minimum. Despite reprogramming and putting these additional measures in place, we ensured the full road closure was safely reduced from the planned 7 weeks to 4 weeks. We also received fantastic feedback from the local community, with a local business owner commenting:

"National Grid Gas Transmission have gone beyond their role to aid residents."

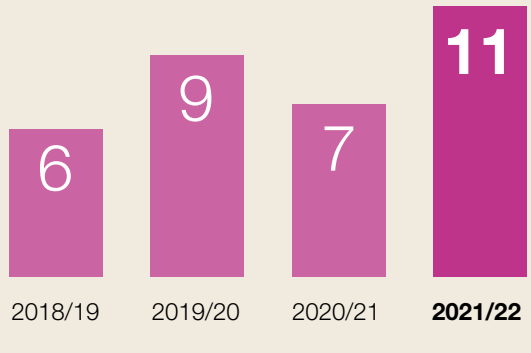
Customer connection landscape

There has been a steady increase in applications over the last few years (although we did see a slight dip during the COVID19 pandemic). However, the number of applications made a significant jump at the start of 2022, and we expect this trend to continue.

During this time, we have seen our first Biogas connection and we have 3 more in the offer/build phases with further enquiries and potential applications in the pipeline. In addition to this there have been capacity studies relating to hydrogen production.

We are working hard behind the scenes to make it as simple as possible for our customers to connect to the NTS. We are further developing our online portal, where potential new customers can apply online. Within this portal we are widening the parameters of what we call a 'standard design' which will reduce cost and time to produce a connection offer for our customers.

Customer connection applications



CSAT score

8.57/10

"A number of obstacles were encountered along the way that National Grid helped to overcome whilst still ensuring that set criteria was adhered to"

"They had a very collaborative approach and transparency at all stages. I'm very happy working with National Grid"

Strategic Stakeholder Priority 4

To drive positive environmental and community impact

We think green when maintaining, improving, operating, decommissioning or building assets

2021/22 performance dashboard

CO_2 emissions	↓ 6.8% from 2020/21
NO_X emissions	↑ 14.7%* from 2020/21
Methane emissions	↓ 12% from 2020/21
Environmental incidents	53
PCDs	58% progressing in line with plan**

* This is due to an increase in utilisation of non-Dry Low Emission units compared to 2020/21, including large increases at Hatton and Wormington, mainly due to extended maintenance outages on the Variable Speed Drive electric units at both sites
** as at end of Sept 2022

Learning from and mitigating environmental incidents

Operating in a safe and responsible manner is core to our values and we strive to achieve the highest standards in environmental management.

Whilst our priority is to prevent any environmental harm resulting from our operational activities, we are committed to actively responding in an efficient and responsible manner to incidents which may occur. Of the 53 incidents which occurred in 21/22, 3 needed to be reported to our environmental regulators and we received no environmental civil sanctions.

We are committed to learning from these incidents and to implementing continual improvements in our environmental management and safety cultures, to minimise, and ideally eradicate, future negative environmental impacts.

We have worked hard to successfully retain our ISO14001 accreditation for our environmental management system since we began the separation process from National Grid earlier in 2022. We have also seen proactive reporting from across all areas of GT&M – from good catches all the way up to incidents. We are ensuring these catches as well as incidents are shared with colleagues across the business to allow learning and actions to be undertaken to prevent further incidents from occurring.

Repurposing redundant assets to reduce our environmental impact and support the drive towards net zero

Reusing, recycling and selling unused and redundant assets from the NTS is one way we are reducing our environmental impact and keeping our costs low.

We have been awarded £77.5m in allowances for RIIO-2 to allow us to complete decommissioning projects in around sixty locations – these projects range from individual assets which are no longer used, to full sites that have become redundant.

Some of these decommissioned assets are being put to good use through the FutureGrid project (see page 7 for more information). By reusing these NTS assets for testing this will provide more accurate evidence on how our existing assets will perform transporting Hydrogen, it avoids waste and negates the environmental impact of constructing new assets for testing purposes.

Recovering assets supports us on our pathway to net zero, by reducing our carbon footprint.

Of the 85 discreet projects:

37	43	5
planned	in design/ build	complete

We've published our first Annual Environment Report, you can find it **here**

Environmental action plan

The Environmental Action Plan (EAP) is a new requirement within the RIIO-2 Price Control framework. It contains 30 commitments split over five key areas.

Focus area/commitment	RAG	Update
Air Quality and Compressor Emissions We will work to reduce our NO_x emissions from the business by the end of RIIO-2. This includes replacing some of the most-polluting compressors on our network with cleaner technologies, improving local air quality.	▲ 14.7%	The NO_x emissions have increased by 14.7% from 2020/21 levels. This is due to an increase in utilisation of non-DLE units compared to 2020/21, including large increases at Hatton and Wormington, largely due to extended maintenance outages on the VSD electric units at both sites.
Climate Change and Our Climate Commitment We will develop a science-based target by 2023. Science based targets are industry best practice. While we are developing the target, we are setting out a package of commitments that begin to help us to reduce our carbon footprint.		The science based targets instititue has withdrawn access to its frameworks for companies whose portfolios contain more than 50% fossil fuels. However, GT&M are creating glidepaths to emulate science-based targets. The methane emissions reduction campaign seek up to £30m of investment, targeting up to 1,000 tonnes of methane emission reduction and improvements in fugitive methane emission detection and quantification.
Responsible Asset Use We will remove eighty redundant assets, asset groups or sites, supporting a sustainable lower carbon future through responsible demolition including asset repurposing.	5 complete	We are working on 85 projects in this area. So far 91 individual assets have been repurposed into FutureGrid. (See above case study for more details)
Caring for the Environment We'll make sure both new construction and demolition projects include initiatives to protect and promote biodiversity, and we will enhance the value of natural assets on non-operational land.	▲ 2.2%	We are increasing the environmental value on non-operational land, through increasing biodiversity and natural capital. At the Woodham Partnership close to our Aylesbury Compressor Station, 9.5 hectares of land has been subject to intervention and has resulted in a 2.2% increase in natural capital valuation for 2021/22, contributing towards our target to obtain a 10% increase in environmental value by the end of RIIO-2.
Leadership for change We will embed sustainability in our decision making, be transparent on our progress, and work with industry to drive forward the sustainability agenda.		Our ESG strategy has been developed with input from stakeholders. We now look to set out our plans for specific initiatives in year 2.

Understanding and mitigating our methane emissions

We are passionate about reducing our impact on the environment and we know that methane emissions make up a significant contribution towards our environmental footprint.

We've committed to work with other networks and our supply chain to get a much clearer understanding of fugitive emissions whilst proactively reducing vented emissions.

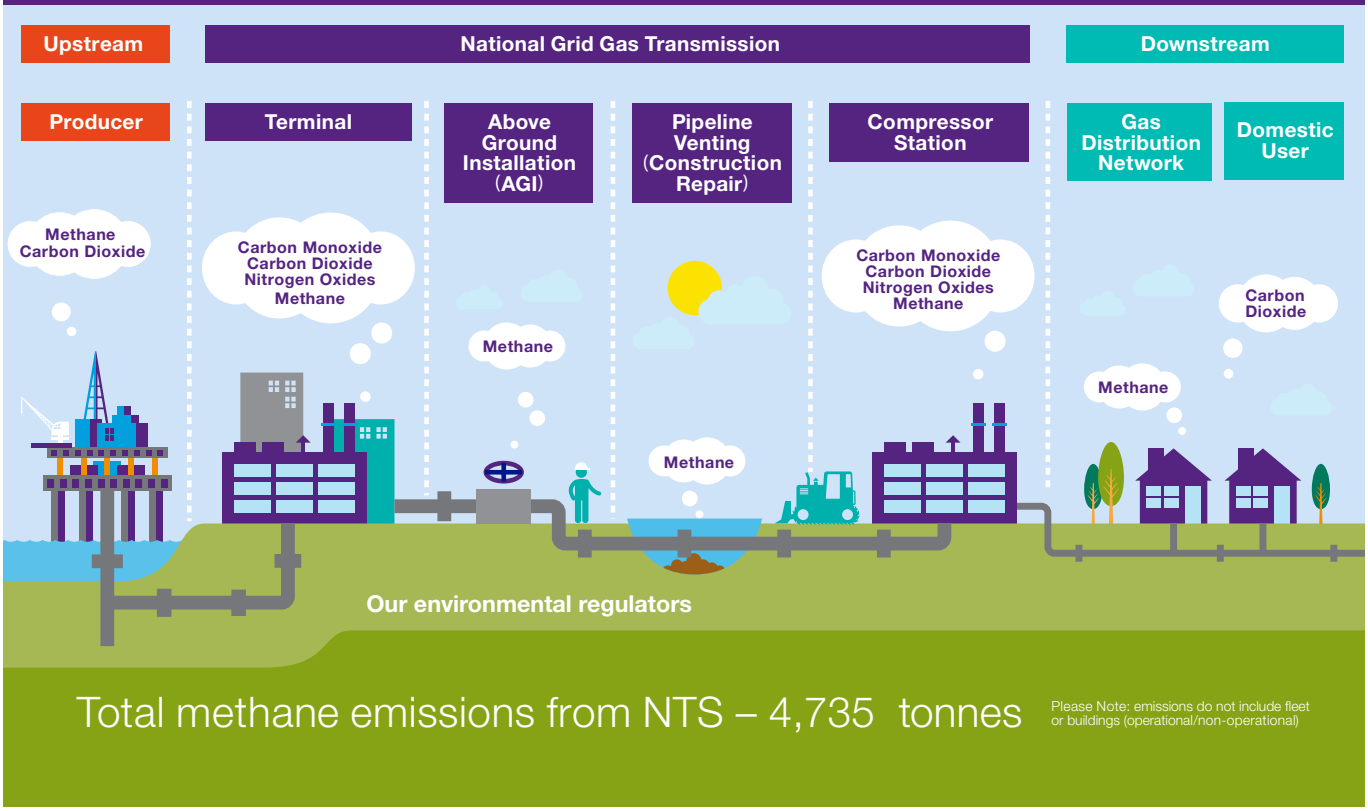
Our methane emission performance is currently 4,735 tonnes of methane per year.

To bring this down, we've developed a proposal of innovative investment and enhanced detection to reduce methane emissions associated with operating our network.

We have submitted two investment proposals to Ofgem in October under the Net Zero Pre-construction Work and Small Net Zero Projects Re-opener funding mechanism and expect to make a further proposal before the end of 2022.

How we've reduced emissions so far:	Proposed investment:
• Minimising compressor venting • Recompressing natural gas from planned pipeline maintenance with existing capability • Periodic 4-yearly leak survey of compressor stations and terminals.	• Expanding pipeline recompression capability • New smaller recompression units to recompress pipeline inspection gauges and reduce vented emissions from planned maintenance • Continuous and enhanced periodic fugitive emission detection and quantification • Trial of compressor recompression and zero loss compressor seal technology.

Emissions from the National Transmission System (NTS)



Total methane emissions from NTS – 4,735 tonnes

Please Note: emissions do not include fleet or buildings (operational/non-operational)

Our proactive and collaborative relationships with our environmental regulators

We are embracing our role at the heart of the energy system and understand the critical part we play in tackling climate change.

We are passionate about making a difference and are working proactively with our regulators. We know we must make significant changes to curb emissions, and we have already taken important steps to do so.

We have established best practice engagement with our environmental regulators, seeing them as our partners in delivering the most effective environmental performance we can. Through our regular interactions with them and through the day to day conversations we have as a business we are identifying and sharing innovative techniques to proactively reduce our emissions as a business.

Proactive engagement	Content
Bi annual network review meetings with all 3 environmental regulators (EA, SEPA, NRW)	Emissions performance, investment strategy for emissions compliance and reduction
	Agree forecasted compressor unit utilsation and review installation outages
	Any issues and their impact on emissions performance
Annual compressor inspections by Env Regulators	Review individual installation compliance
	Discuss site changes upcoming projects/works that will impact the site and its environmental performance
	Documented and Corrective Action Reports issued from the Regulator, scoring the level of compliance and detailing any actions/ observations made while on site
Subject Specific Engagements	We hold regular topic specific sessions, identified either by GT or our environmental regulators

NG Group Highlights

23,416
colleague volunteering hours (increase of almost 30% on 20/21)

1,167
Employees volunteered for Grid for Good, helping

3,972
young people

£18.3m
of corporate responsibility work

£2.8m
awarded in community grants (since 2015)

Having a positive impact where we operate

Our aim "We deliver positive, meaningful and sustainable social impact, promoting the wellbeing and development of our people and adding value to both the communities within which we operate and wider society"

Our strategy has been designed to cover 4 key areas of business and community impact:

- **Charitable giving** – Our chosen corporate charity partner (selected through employee vote) is Barnardo's. We are currently at the very start of our 3 year partnership and aim to raise £100,000. Our activities range from simple monetary donations, to skills-based volunteering and knowledge sharing
- **Employee volunteering** – We offer our time, skills and expertise to charities, community groups and non profit organisations close to our operations. Our staff are encouraged to volunteer and are given 2days paid leave per year to do so
- **Community engagement** – We put our communities at the heart of our projects. We keep them informed and continually assess how we can have a more positive impact through community engagement
- **Future skills and education** – We are building a strategy to drive positive community impact on a basis of mutual learning, skills sharing and providing opportunities for underrepresented communities to enter into the STEM sector.

Strategic Stakeholder Priority 5

To invest in our people, grow our capability and value everyone's contribution

5

We're nowhere without our teams, and our business is only as good as its people

2021/22 performance dashboard

Enablement score	70
Ensuring we have a diverse workforce which is inclusive for all	29%
No. of responses to job ads	↑ 3x
A workforce that demonstrate strong physical and mental wellbeing	77%

Ensuring we inspire a generation, and have a skilled workforce for the future

In 2021 we launched our new Degree Apprentice scheme – giving budding engineers a route into business with on-the-job experience, and no lengthy, costly university courses.

The scheme lasts 4 years and 4 months and our apprentices graduate with a "BEng Science Industry/Process Plant Engineering" qualification which allows them IEng professional registration.

In the first year of the scheme 5 apprentices joined Gas Transmission, and enjoyed a number of modules, finishing with a number of elective courses that are most relevant to their substantive role.

The scheme will have an intake every other year and we engage with schools and colleges close to our operational sites in careers talks and careers fayres. Over the summer we hosted students from two colleges on a 3 day work placement with us. We received some fantastic feedback and some of the individuals have already been in touch to find out when they can apply for the scheme.

> *"This is an exciting opportunity for young people interested in engineering, but it's also a great opportunity for us to get out into local schools and colleges and educate and inspire the next generation into jobs that support the UK's energy transition."* **Wayne Lawson**, scheme sponsor for GT

> *My first year of the degree programme has already been a very rewarding and insightful experience. The university modules are a great overlap into the workplace where I can apply university concepts to further my understandings when working closely with subject matter expert engineers.* **Lily-Ebony Ganchi**, Degree Apprentice

Modernising Talent Acquisition to reach more diverse, passionate people

An overhaul of our Talent Acquisition is allowing us to explore better ways of reaching the market of individuals who can help us meet our RIIO-2 commitments and deliver for customers.

We are committed to being a fair employer and reaching a wider market of people beyond those already in the industry. This will help us in building a diverse company, with diverse thinking.

What have we done?

- We've explored a new tone of voice for our organisation, making us less corporate, and more approachable from a candidate perspective, this has resulted in a significant uplift in the number of people interested in our roles
- We use gender decoders to ensure our language is more neutral encouraging more applications from women. Given the majority of our technical roles have skillsets typically filled by men, it's important to us to create a platform for female engineers to build a career.

Future

As we move into 2023 we'll be furthering our efforts and working with stakeholders to broaden our route to market.

Becoming more innovative and efficient in our recruitment we aim to position ourselves as an employer of choice in a wider variety of communities across the UK.

Examples of reaching a broader pool of candidates

- **Chemical & Industrial Engineer** (historically difficult to fill role) **90+ applicants** and 15 for interview in less than a week advertising
- **Quantity Surveyor** – had **12 people** invited for an interview on a Monday after the advert went out 3 days previously.

Both of these were filled in less than 3 weeks', with multiple hires per role.

Our culture and purpose

A purpose led culture inspires employees and provides clarity on the outcomes and success of the business. The clarity of outcomes allows for prioritisation of business and stakeholder requirements.

As we transition away from National Grid, it's a key time for us to review where we are, and where we want to be. It is important to us that our employees understand our role, our direction and the results we expect.

Our Cultural Dimensions
where we want to get to

Caring: Whilst we already show great care to our employees, customers and stakeholders, we want to take this up a level and ensure that we show how much we care about the services we offer, inviting more regular feedback on work we undertake whilst also providing feedback to those who we interact with. This will allow us to further develop our relationships with our customers and stakeholders.

Purpose: Where we truly understand the impact we have on society and facilitating the energy transition. Everyone understands their role and responsibilities, how they fit into the bigger picture with a desire to delight our customers and stakeholders.

Results: We are clear on our collective results for the business, customers and stakeholders and how we are going to achieve them.

Independent User Group Report

Over the last 12 months, working with GT, we have reviewed our governance, refreshed our membership and re-defined our purpose. We welcome GT's commitment to the enduring role of the Independent User Group (IUG) and to its articulation of the valued feedback and constructive challenge that we provide.

We thank the leadership team and staff who provide the responsive and comprehensive support we require of them in a timely manner and of the highest quality. The IUG will continue to challenge GT to deliver the best for its stakeholders and for consumers, now and in the future, and we know that GT will expect nothing less.

Topic	IUG Impact
Performance	GT are more candid about their performance, the challenges as well as the areas of strength, and the associated reporting is now much more transparent. We have particularly welcomed GT's willingness to share their internal performance dashboard with the IUG.
Stakeholder engagement	GT have come a long way in their journey to becoming a stakeholder-led organisation. Areas of note include: • Directorate engagement plan leads ensuring there is a golden thread through to decision making • Engagement metrics specifically around inclusivity and representation that will sit on performance scorecards • Stakeholder community of practice to share best practice and support the culture of being stakeholder-led • Consumer research collaboration.
Compressor Emissions PCDs	We understood the engagement and supported the approach. It was clear that the programme is challenging, including feedback that any commercial changes in the industry would be complex against the timescales highlighted by GT. We encouraged GT to target additional consumer representatives in their engagement, ensure they demonstrate a balanced view for consumers as well as for terminal users and to consider the impact of the wholesale price.
Future of Gas	We welcomed GT presenting this internal narrative. We shared a number of challenges with them: • Needs to be more aligned to FES 2022 • Evidence based audit would be useful if using externally • Using a regional approach should be considered to increase stakeholder confidence • Reflect policy in the devolved nations • We believe storage has a critical part to play and therefore should be incorporated into the narrative • Positioning of the document could be improved i.e. drawing out the challenges of a hydrogen future vs an electricity future. This should be evidence-based and placed in the whole system context and against a range of scenarios.
Innovation and Net Zero	We welcomed the update on GT's Net Zero and Innovation plans linked to its works on Hydrogen. We also signal a need to see the wider innovation landscape and GT are committed to doing this. We highlighted that GT needed to greatly enhance its leadership role on net zero and whole systems working. We have seen improvements in this approach, with GT articulating its work with the other gas distribution networks and early works being considered with the electricity networks.
Responsible Business	As GT moves to a standalone company, it is undertaking a review of the Responsible Business framework and governance, to ensure alignment with the new business structure and priorities. GT intends to simplify the Responsible Business approach and align it with established external ESG frameworks, with specific measurable targets. Central to this approach will be the IUG recommendation of looking to external best practice, and seeking opportunities for benchmarking, to ensure the new approach both meets stakeholder expectations and is suitably challenging. Furthermore, aligned with IUG feedback, GT is supporting a cross-industry initiative to develop a common approach to Social Value measurement and reporting.

Glossary

Asset risk	The risk of an asset failing to perform its function, leading to a potential safety, reliability or environmental issue or a loss of resilience
BEIS	BEIS is the ministerial department responsible for Business, Energy and Industrial Strategy
Biogas	Methane that has been produced from waste materials such as agricultural waste, manure or municipal waste.
Capacity	The amount of gas that can be transported through the NTS or at a particular point on the NTS (e.g. a terminal entry point)
CO_2 emissions	Carbon emissions are emitted as part of operating the network
Compressor	A large piece of equipment that boosts the presssure of gas in the network, pushing gas through the NTS from where it is produced to where it's needed, and maintaining the pressure required for safe operation of the network
Constraints	When we are unable to provide the capacity in the network that has already been purchased
Consumer bill impact	The portion of the consumer bill attributable to National Grid Gas Transmission
Emissions compliance	Compliance with the emissions targets set by our environmental regulators
Employee enablement score	As part of our employee survey we measure if our employees feel they have the right tools, skills and resources to do their jobs effectively
Energy Market	Energy markets are commodity markets that deal specifically in the trade and supply of energy
Energy transition	Moving away from high carbon fossil fuels to low/no carbon energy sources
Enhanced engagement	The additional engagement we undertook to build our business plan for RIIO-2 to ensure it is stakeholder-led. This included our Independent User Group, The Challenge group and delivering a robust stakeholder and consumer engagement programme
Environmental incidents	An incident that has a real or potential impact on the environment (e.g. a spillage of oil), the severity of which is categorised depending on the level of imapct on the environment
ESG strategy	Environmental, Social and Governance, the 3 pillars of corporate responsibility that companies are expected to report against that capture all non-financial risks and opportunities
Fugitive emissions	Emissions from the network that are released unintentionally e.g. small leaks of gas
Gas Quality/ GSMR	Gas Safety (Management) Regulations govern the quality of the gas that can be transported through the NTS. There are a number of measures around gas quality that are actively monitored and managed to ensure that the gas used by consumers remains safe to use
Gas Terminal	The facility that receives and processes gas as it comes in either from the UK Continental shelf, via Interconnectors or via LNG ships
Grid for Good	Grid for Good is National Grid's global community investment program that connects young people with inspirational sessions designed to upskill and improve their employability
Hydrogen	A gas which can be burnt in a similar fashion to methane, but which produces no carbon emissions, that could be used to replace methane
Industrial clusters	A group of companies (major energy users, producers, networks) that work together, in this case to develop proposals for delivering net zero
Interconnectors	Gas interconnectors are pipelines that connect GB to other countries
Inter-seasonal storage	The storage of energy for a long period of time (several months) to address the challenges between seasons
Lost time injury frequency rate	A measure of safety performance, calculated using the formula 'number of incidents/number of working hours x 100,000', equivalent to the expected rate of injury over a persons working life
Market Frameworks	The rules and tools that are used within the energy market
Methane emissions	Methane emissions can occur when we maintain our network or as a result of leaks from aging assets, or as part of normal safe operations (e.g. needing to vent gas from equipment in order to maintain it safely)
Modification proposal	When a need to change the UNC, a modification proposal is developed to ensure all impacts are understood
Network Innovation Allowance (NIA)	NIA provides funding to take forward innovation projects that have the potential to address consumer vulnerability and/or deliver longer-term financial and environmental benefits for consumers
Non-Dry Low emissions compressors	A type of compressor that does not have emissions reduction technology to remove NO_x emissions
NO_x emissions	Nitrogen Oxides (NO_x) are produced during the combustion of fossil fuels. NO_x emissions can lead to pollution which can cause respiratory diseases
NTS	National Transmission System – the equivalent to the motorways of the road system. The NTS moves gas, in bulk, from gas terminals to businesses and distribution networks
Ofgem	The energy regulator with a role to protect consumers by working to deliver a greener, fairer energy system.
Operational sites	The locations we operate our network from including compressor sites and terminals
Price control Deliverables	The outputs we have agreed with Ofgem to deliver in this price control period (2021–2026)
Redundant assets	Equipment that is no longer needed on the NTS due to changing customer needs
Repurposed assets	Reusing the equipment either in another part of the network or at our FutureGrid facility
RIIO2	The regulatory period we are in that sets what we deliver for consumers and how much revenue we receive
Safety Case	The regulations that apply to transporting gas to provide a safe and reliable system
STEM	Science, Technology, Engineering and Maths – the key areas we are working with schools and academic institutions to develop the capabilities to deliver net zero
Strategic Innovation Fund (SIF)	The Strategic Innovation Fund (SIF) is designed to drive the innovation needed to transform gas and electricity networks for a low-carbon future, finding and funding ambitions and innovative projects to help shape the future of energy networks and accelerate the transition to net zero at lowest cost to consumers
Supply chain	The companies we work with to deliver outcomes for consumers, such as construction contractors, equipment manufacturers, suppliers of spares and PPE
Sustainability	Sustainability is working towards outcomes that deliver positive environmental, social and financial outcomes
System Operation	Managing the flows of gas on the NTS, balancing supply and demand, and keeping the pressures within strict safety limits
Transmission charges	The revenue we receive as part of the RIIO2 deal for maintaining the pipeline is spread out amongst the Shipper community. This is known as the Transmission Charge
UK Continental shelf	The region of water that surrounds the UK where there are numerous oil and gas fields.
Uniform Network Code	Sets out the rules and arrangements between gas transporters and gas shippers
Unplanned outages	An interruption of gas supply without any warning to the customer
Variable Speed drive electric units	A type of compressor that is powered by electricity instead of methane
Whole Energy System	Understanding the interactions between and developing a holistic energy system including electricty and gas at a transmission and distribution level
Winter preparedness	The work we've undertaken to ensure the NTS is in the best place possible for winter
Workforce health and wellbeing index	As part of our employee survey we measure the health and wellbeing of our workforce

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