

National Grid Gas plc

Annual Environmental Report

Company number 2006000

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SECTION 1: ANNUAL ENVIRONMENTAL REPORT INTRODUCTION

Purpose of the Report

This Annual Environmental Report (AER) is our first within the context of the RIIO-T2 price control framework and has been prepared to meet the requirement of Special Condition 9.1 (SpC 9.1) of the Gas Transmission (GT) and Gas Distribution (GD) licences. The focus of this report is solely on National Grid Gas Transmission (NGGT) activities and provides our stakeholders with an overview of progress against the five pillars of our Environmental Action Plan (EAP) and the activities we have undertaken over the reporting period to manage and reduce our environmental impacts.

The reporting period for this AER is 1 April 2021 to 31 March 2022 in line with the RIIO-T2 price control period that applies to the five-year licence beginning on 1 April 2021.

The AER has been prepared in accordance with the [RIIO-T2 Environmental Reporting Guidance](#), finalised following consultation in March 2021.

This report is supported by a Methodology Annex Document (Appendix A) which describes the scope and boundaries of our environmental commitments, along with the assumptions made regarding our calculation and measurement methods. Progress against our EAP targets - which are also reported as part of our Business Carbon Footprint (BCF) Scope 1 and 2 emissions - are included within the Ofgem Regulatory Reporting Process (RRP). NGGT considers our governance process for RRP provides consistent and robust coverage for the sign off data assurance activities as stipulated by Ofgem.

Chief Executive Message

Jon Butterworth, Chief Executive Officer, National Grid Gas

I am delighted to share with you our first National Grid Gas Transmission Annual Environmental Report for RIIO-T2. I truly believe in the role that National Grid Gas Transmission will play in delivering the United Kingdom's ambitious environmental and climate objectives, whilst powering an energy transition where no one is left behind. This report outlines the positive steps we have taken during the last year to deliver this.

It has been a monumental year in the fight against climate change.

The COP 26 Climate Conference, held in Glasgow last November, shows what can be achieved when countries come together to tackle global problems. Our parent company, National Grid, was proud to be a Principal Partner for the Conference, including supporting the Secretariat to deliver the Green Grids Initiative – One Sun One World One Grid scheme – to connect energy grids across borders. Within NGGT, we were pleased to engage with experts from around the world to discuss hydrogen's critical role in the energy transition, and also to confirm our commitment to the Global Methane Pledge which encourages countries to work together to collectively reduce methane emissions by at least 30% below 2020 levels by 2030.

Earlier this year, I visited our FutureGrid hydrogen transmission test site in Cumbria to get a glimpse of our energy future. This will be integral to giving us the insights we need to successfully convert our network to carry hydrogen, and the construction of this site is progressing at great speed, with a view to beginning testing in 2023. Hydrogen is something we see as a genuine solution to the transition to net zero, given the importance of gas to the energy mix overall and the potential of hydrogen created from renewable sources.

Within this report, you will find more detail on our successes and the environmental work we have undertaken this year, as well as a comprehensive update on our Environmental Action Plan. In this Plan we commit to demonstrating organisational leadership and making the right strategic choices to drive change for better environmental outcomes. As we look ahead to next year, we commit to further embedding sustainability in our decision making, being transparent on our progress, and working with the wider energy industry to drive forward the sustainability agenda.

I am incredibly proud of both the specific initiatives we have taken to make our business more green, as well as the contribution we are making to the environmental challenges we have ahead of us - as an industry, as a country and as a planet.

Key Environmental Performance Highlights - FY 2021/2022

We are committed to ensuring Responsible Business is at the heart of our strategy - it is embedded within our Purpose - Leading a Clean Energy Future for Everyone. Our strategy covers five main areas where we believe we can have a positive impact, and we are pleased to report a range of metrics for the progress we are making on each. Below are some of our performance highlights from the last year:

Climate Change and Our Climate Commitments

- Our FY 2021/2022 Scope 1 and 2 Greenhouse Gas (GHG) emissions were 296,524 tCO₂e, a 4.68% decrease against the previous year
- We completed a consistent assessment of physical climate change risks to our assets - both now and at future intervals - and commissioned an interactive geographical visualisation tool to show risks for 2°C and 4°C scenarios and several timeframes

Air Quality - Compressor Emissions

- We aligned with the Global Methane Pledge to collectively reduce methane emissions by at least 30% below 2020 levels by 2030
- To fulfil this Pledge, we are working with Ofgem to implement a methane emissions reduction plan and to increase detection of leaks across the NTS

Responsible Asset Use

- 74% of our 250 most carbon-intensive global suppliers now have carbon reduction targets in place
- A common set of sustainability and carbon impact questions has been established for all tender events, and the weighting increased from 5% to 10%
- We achieved 99% of construction waste being diverted from landfill. The recorded recycling rate is 97%

Caring for the Natural Environment

- Following assessments of all NGGT land, we have established a baseline of 4,165.61 biodiversity units. This will be enhanced by 10% by the end of the RIIO-T2 period
- Biodiversity Net Gain assessments were undertaken at 69 construction and operational sites across Britain

Leadership for Change

- We have shared our carbon and natural capital tools within the industry via various working groups, forums and knowledge sharing events, such as the Net Zero Infrastructure Industry Coalition and Major Infrastructure Resource Optimisation Group
- Through our employee volunteering programme, our colleagues have been working with The Conservation Volunteers - an organisation dedicated to connecting people and green spaces - to enhance the natural environment at our operational sites

Who We Are and What We Do

NGGT is part of National Grid Gas plc (NGG). NGGT owns and operates the regulated gas National Transmission System (NTS) in Great Britain and owns an independent gas metering business.

As both the transmission owner and system operator, we own, build, and operate the high-pressure NTS with day-to-day responsibility for balancing supply and demand in real time, and facilitating the connection of assets to the NTS. The NGGT network comprises approximately 7,660 kilometres of high-pressure pipeline and 23 compressor stations connecting to 8 distribution networks and other third-party independent systems.

The NTS provides jobs and supports growth - both directly and through our extensive supply chain. The UK employs 130,000 gas engineers alone and many further thousands of jobs are supported. These jobs are often highly skilled and provide individuals and families in every single region of the UK with financial security.

NGGT also owns and operates an independent metering business, the largest owner of traditional gas meters in the UK, with approximately 8.4 million domestic and commercial meters as of March 2021.

In March 2022, National Grid plc confirmed plans to sell a majority stake in its UK gas transmission and metering business to a consortium comprised of Macquarie Asset Management, a global asset manager and the world's largest infrastructure manager, and British Columbia Investment Management Corporation, one of Canada's largest institutional investors. The sale is currently in the process of completing, at which point the gas transmission and metering business will become its own entity.

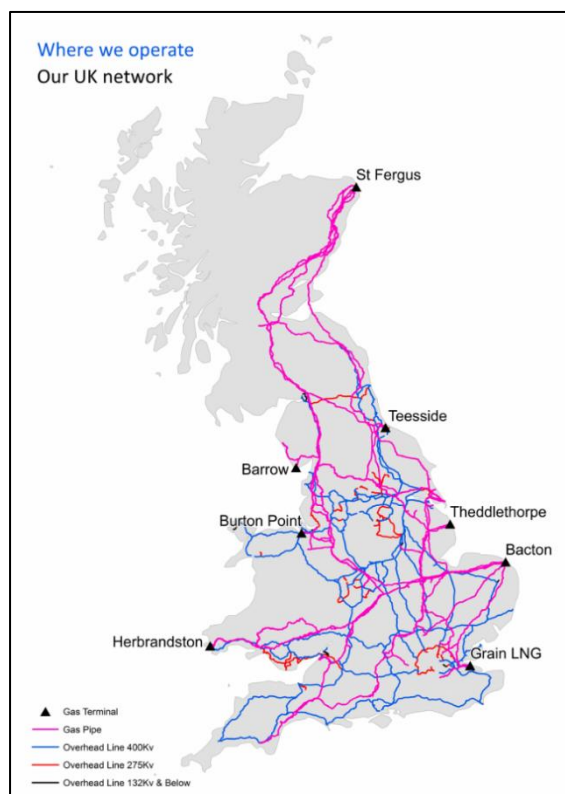


Figure 1: NGGT's NTS which connects the length and breadth of the United Kingdom and ensures everyone has the energy they need

Our Purpose, Priorities and Values

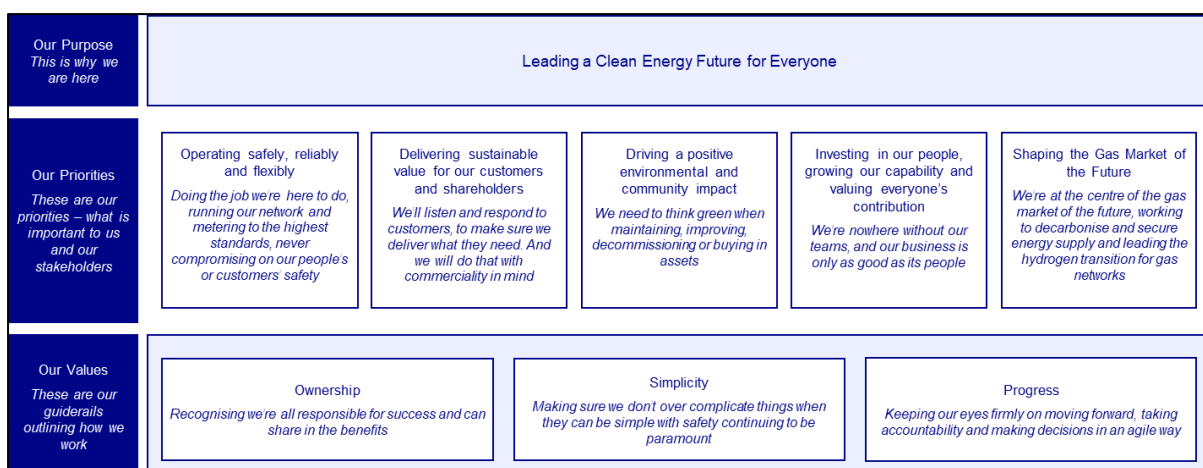


Figure 2: NGGT Purpose, Priorities and Values

Our Approach to Responsible Business

We are committed to ensuring Responsible Business is at the heart of our strategy. It is embedded within our Purpose - Leading a Clean Energy Future for Everyone.

We believe we can play a critical role in the UK's path to net zero by 2050. Our aim is to respond to the need for energy solutions that are clean, safe, reliable, and available, and to deliver long-term sustainable value for our customers and stakeholders, whilst ensuring a positive and lasting impact on the environment, our people and society at large.

We structure our approach to Responsible Business under Environmental, Social and Governance (ESG) pillars. By recognising and addressing ESG factors that are pertinent to our business, we can proactively manage commercial risks, whilst embracing opportunities beyond statutory and regulatory compliance, to create sustainable value.

We believe our Responsible Business approach defines who we are and who we want to become - both culturally and in terms of our strategic direction. It ensures we will continue to play a vital role at the heart of the Britain's integrated energy value chain - today, in 2050 and beyond.

Our Environmental Responsibilities

Looking after the environment is crucial to our business - both in our long-term vision for the UK energy mix and our day-to-day operations. Gas is, and will be for decades to come, a major contributor to the blend of energy sources powering the UK. At any one time, up to 50% of the nation's energy could be supplied by gas. Security of energy supply is something many of us take for granted, and delivering it is a responsibility we, at NGGT, take incredibly seriously. But we know it is important to balance this with our environmental obligations.

We are aware of the critical role we play in solving current and future challenges for energy and are ensuring that we are flexible in how we provide and use energy. A gas like hydrogen, for example, will be an integral part of the UK's future energy mix and we want to be at the forefront of delivering the benefits of connecting supply and demand.

This is the macro-role our company and industry can play in environmental challenges. But we know we must also walk the talk ourselves and believe we have made good progress this year.

SECTION 2: OUR ENVIRONMENTAL STRATEGY - ENVIRONMENTAL COMMITMENTS AND IMPACTS

Background to the EAP

We believe we have a critical role to play in helping to deliver the UK's net zero ambition by 2050, by leading a fair energy transition for all. In delivering this aim, we strive to achieve minimal adverse environmental impacts across all our operations whilst also seeking ways to enhance the local environment. Our overall Safety, Health and Environment ambition is to protect the environment and act sustainably every day. This approach aligns with Ofgem's environmental focus areas for the RIIO-T2 regulatory period:

- Decarbonising the energy networks - with a focus on business carbon footprint and embedded carbon
- Reducing networks' other environmental impacts i.e., pollution to local environment; resource use and waste management; biodiversity loss; and other adverse effects that are specific to each sector
- Supporting the transition to an environmentally sustainable low-carbon energy system

Following extensive internal and external stakeholder engagement we made firm Environmental Commitments in our December 2019 Business Plan. Our NGGT Business Plan Commitments (BPC) were subsequently developed into our Environmental Action Plan (EAP) which consists of specific targets under five pillars, with clear accountabilities and work programmes, which will drive improved environmental performance (see Appendix B - NGGT Environmental Action Plan).

Development of the EAP

Materiality

Materiality is the process we undertook to determine which environmental issues were sufficiently important to form part of our EAP. We completed a review of environmental topics, focusing on those most material to our organisation, in order to:

- Support our role in the net zero transition
- Achieve minimal adverse environmental impacts across all our operations
- Enhance the local environment

From this assessment we have confirmed that our most material areas are:

| Material Environmental Issue | Description |
|--------------------------------------|--|
| Global GHG emissions | Carbon Dioxide, Methane, Nitrous Oxide, HFCs, PFCs, Sulphur Hexafluoride, and Nitrogen Trifluoride |
| Local air quality | Particulate Matter, Ozone, Nitrogen Dioxide, Carbon Monoxide, and Sulphur Dioxide |
| Climate risk | Risk to assets based on climate change |
| Natural environment | Biodiversity, natural capital, land use |
| Responsible resource usage | Water, waste, circular economy |
| Decarbonisation of the energy system | Hydrogen, Carbon Capture Usage and Storage (CCUS), customer facilitation to decarbonisation |

Figure 3: Material issues requiring consideration

Risk and Opportunity

To further develop the EAP, we reviewed our Environmental Aspects and Impacts Register to ensure all significant risks and opportunities had been considered. The summary of the 'high impact/high risk' and 'high impact/high opportunity' are summarised below:

| Design | Transportation/ Logistics | Use/Operation | End of life treatment | Indirect activities |
|---|--|--|--|---|
| <ul style="list-style-type: none"> Capital carbon from construction design Loss of natural capital/biodiversity | <ul style="list-style-type: none"> Business travel Operational travel Employee travel | <ul style="list-style-type: none"> Fugitive emissions from equipment Venting from compressors Air pollution emissions Excessive use of energy from fixed sites Excessive use of water Noise pollution from compressors | <ul style="list-style-type: none"> Generation of unnecessary waste from our offices, operational sites, and construction Decommissioning of plant and equipment Disposal of waste | <ul style="list-style-type: none"> Poor supplier or supply chain management using unsustainable resources Environmental impacts associated with extraction, manufacture, storage and delivery of products and services procured and used by National Grid |

Figure 4: High impact/high risk environmental aspects

| Design | Transportation/ Logistics | Use/Operation | End of life treatment | Indirect activities |
|---|--|---|---|---|
| <ul style="list-style-type: none"> Reduce capital carbon from construction design as much as is feasible and offset the remaining to deliver net zero construction Incorporate net gain at a design stage, so no biodiversity is lost | <ul style="list-style-type: none"> Alternatively Fuelled Vehicles (AFV) to reduce impact on transport and logistics | <ul style="list-style-type: none"> Reduce fugitive emissions Reduce emissions from venting Purchase 100% renewable energy Enhance the land of our non-operational sites to improve natural capital Reduce water use at our sites | <ul style="list-style-type: none"> Follow the waste hierarchy, focusing on reusing and recycling Focus on circular models | <ul style="list-style-type: none"> Supplier engagement on sustainability issues Mandated requirements for suppliers to follow |

Figure 5: High impact/high opportunity environmental aspects

Environmental Commitments within the EAP

These key areas of focus were then translated into clear actions and targets within the EAP, grouped under 5 pillars:

| EAP Pillar | Statement of Intent | Target |
|--|--|--|
| Climate Change and Our Climate Commitments | We will reduce our total business carbon footprint | <ul style="list-style-type: none"> • Reduce methane emissions (CO₂e) from leaks on the network • 30% of our operational fleet replaced with AFV (80 vehicles and charging points at 45 sites) • Reduce carbon emissions for our business transport by 10% • Reduce carbon emissions from our office energy use by 20% • Purchase 100% of electricity for our offices from renewable sources • Continue to participate in the UK-ETS • Achieve carbon neutral construction for major projects starting in RIIO-T2 • 75% of top suppliers (by Category/Spend) will have carbon reduction targets • Install renewable generation on our operational sites for our own use • Assess and report our risk from climate change on our assets on network operation during RIIO-T2 and beyond • Deliver a science-based target for NGGT by 2023 |
| Air Quality - Compressor Emissions | We will work to reduce our NO _x emissions from the business by the end of RIIO-T2 and beyond | <ul style="list-style-type: none"> • Enable reduction in NO_x emissions per hour of gas turbine running from the business by the end of RIIO-T2 |
| Responsible Asset Use | We will address redundant assets, asset groups or sites, supporting a sustainable lower carbon future through responsible demolition including asset repurposing | <ul style="list-style-type: none"> • Implement the ISO 20400 sustainable sourcing process • Reduce the waste intensity of our construction projects year-on-year based on a 2019/2020 baseline • Construction projects: zero waste to landfill from 2022/2023 and increase the recycling or reuse of materials • Construction projects: increase the proportion of recycled materials used on construction projects during RIIO-T2 • Pilot and implement circular economy principles for raw materials, goods procured and existing assets • Address 84 redundant assets, asset groups or sites in RIIO-T2 • Extend the life of equipment where appropriate by refurbishment • Reduce the waste we create at our offices (waste tonnage) by 20% • Recycle 60% of our office waste by 2026 • Reduce water use in our offices by 20% |
| Caring for the Natural Environment | We will make sure both new construction and demolition projects include initiatives to | <ul style="list-style-type: none"> • 10% increase in environmental value on all non-operational land |

| | | |
|-----------------------|--|--|
| | protect and promote biodiversity, and we will enhance the value of natural assets on non-operational land | <ul style="list-style-type: none"> • Act as custodians of our redundant sites by ensuring we reinstate them to a Net Gain in environmental value • Deliver 10% Net Gain in environmental value (including biodiversity) on all planned construction projects • Educate the public about environmental issues through outreach linked to major compressor emissions projects |
| 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 | <ul style="list-style-type: none"> • An engaged workforce on environmental issues that leads by example • Sustainability is fully embedded in our decision making • Produce an Annual Environmental Report (including Business Carbon Footprint reporting) • We will lead in transparency on capital carbon and natural capital using data and tools to collaborate and drive environmental progress |

Figure 6: EAP commitments

We recognise that both environmental materiality and risk/opportunities develop over time, therefore, to ensure we continue to focus on the most important issues, we will undertake an annual review of both our environmental materiality assessment and risk register. We are open to revising our approach as needed to ensure we continue to tackle the most material environmental issues and opportunities. An example of this approach is the development, during FY 2021/2022, of our Methane Emissions Reduction Campaign (MERC) as part of our commitment to the Global Methane Pledge.

SECTION 3: PROGRESS REPORT AGAINST EAP PILLARS

Progress Against the Five Pillars of the EAP

We have made significant advancement in the delivery of our EAP commitments and targets during the first year of the RIIO-T2. As we separate from National Grid Group, we have focused on implementing new reporting systems and processes to ensure both accuracy of data and that steady progress is made according to our implementation plan. This section of the report focuses on the progress we have made in FY 2021/2022 across our five EAP pillars:

CLIMATE CHANGE AND OUR CLIMATE COMMITMENTS

EAP Statement of Intent

We will reduce our total business carbon footprint

EAP Commitments and Targets

- Reduce methane emissions (CO₂e) from leaks on the network
- 30% of our operational fleet replaced with AFV (80 vehicles and charging points at 45 sites)
- Reduce carbon emissions for our business transport by 10%
- Reduce carbon emissions from our office energy use by 20%
- Purchase 100% of electricity for our offices from renewable sources
- Continue to participate in the UK-ETS
- Achieve carbon neutral construction for major projects starting in RIIO-T2
- 75% of top suppliers (by category/spend) will have carbon reduction targets
- Install renewable generation on our operational sites for our own use
- Assess and report our risk from climate change on our assets and network operation during RIIO-T2 and beyond
- Deliver a Science-Based Target for NGGT by 2023

Update Against Commitments and Targets

Our Climate Commitment

The Committee on Climate Change predicts that, without intervention, global temperatures could rise by as much as 7°C over the next century, exposing Britain to increased inland and coastal flooding, water scarcity and heatwaves. The scale and impact of these events on our population will be dramatic; if we don't respond urgently, we will fall far short of our responsibility to future generations to protect society and the environment from irreparable damage.

At NGGT, we fully support the UK Government's ambition to achieve net zero carbon emissions by 2050. We believe that, as an industry, we have the responsibility to address our climate challenge urgently. More fundamentally, we believe our business has a responsibility to lead the transition and secure the investment and shift in consumer attitudes needed to deliver it. We are mapping our physical risks and emissions from our NTS and will be working to reduce these in line with the recommendations from the Task Force on Climate-related Financial Disclosure (TCFD).

We have committed to developing a Science Based Target (SBT) by 2023 (see below). Whilst we are in the process of developing the SBT, we are setting out a package of climate commitments contained within our EAP to help us take immediate actions to reduce our carbon footprint, delivered via our decarbonisation plan.

Alongside this, our EAP targets have been internally verified to ensure validity, accuracy, and quality, and are reviewed with the Gas Distribution Networks (GDNs) to ensure we are aligned with the broader industry approach.

EAP Target Update: Developing a Science Based Target (SBT)

A key climate change commitment within our EAP is to develop an SBT, as verified by the Science Based Targets initiative (SBTi) by 2023. SBT provides a clearly defined pathway for a business to reduce their greenhouse gas emissions, helping to prevent the worst impacts of climate change and future-proof business growth. Targets are considered 'science-based' if they are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement - limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C. The SBTi is currently developing a new methodology for the oil and gas sector to set SBT and, whilst this work is underway, the SBTi is unable to accept commitments or validate targets for companies in the oil and gas or fossil fuels sectors. However, to ensure our progress continues during this period, we are committed to working with other experts within this field - such as The Carbon Trust - to develop a defined pathway for the reduction of our business GHG emissions. The activity will include:

- *Ensuring data integrity and confidence in our Business Carbon Footprint (BCF)*
- *The understanding and applicability of what net zero means for our business*
- *Fully costed options aligned to our overall business strategy, including efficient and economic actions to address controllable BCF in RIIO-T2 and, to identify metrics to track short-term outcomes and overall progress towards SBTi*

BCF - Scope 1 and 2 GHG Emissions

Our FY 2021/2022 BCF was reported to Ofgem in July 2022 as below. We have included data from FY 2020/2021 (end of RIIO-T1) for comparison purposes. In FY 2021/2022, our Scope 1 and 2 GHG emissions were 296,524 tCO₂e, a 4.68% decrease against the previous year. Reductions were primarily achieved in Scope 1 fuel combustion.

The majority of our BCF comprises emissions from natural gas fuel combustion on our network. When considering the most recent financial year (2021/2022), natural gas fuel combustion accounted for 70% of our overall Scope 1 and 2 emissions. These emissions occur due to the requirement to fuel gas combustion for our compressor fleet across the NTS. This will be heavily reliant on compressor run hours and the required demand across the network. In addition to fuel combustion, Scope 1 emissions also account for energy consumption (excluding electricity), transport and fugitive emissions. Significant emissions are associated with venting from compressors which accounts for 17% of overall emissions (FY 2021/2022), being the second largest emitter within our BCF. Active control of venting necessity is in place to ensure we limit venting to those events where there is no alternative solution. Scope 2 emissions refer only to our electricity consumption and in FY 2021/2022 accounted for 11% of our total BCF.

BCF - Scope 3 GHG Emissions

Like many businesses, a large proportion of our GHG emissions are Scope 3 i.e., all indirect emissions that occur within our value chain. As such, many of our EAP commitments relate to measuring and setting targets for Scope 3 emissions. Progress against these targets is outlined in Appendix C - Performance Tables. Whilst our Scope 3 reporting is currently limited, we intend to increase our focus on this in future reporting years.

| Scope | Emission | Category | Units | FY 2020/2021 | FY 2021/2022 |
|------------------------|--|-----------------------------|--------------|--------------|--------------|
| Scope 1 | Energy consumption (excluding electricity) | Energy consumption | tCO2e | 553 | 324 |
| | | Total | tCO2e | 553 | 324 |
| | Transport | Direct commercial vehicles | tCO2e | 1,572 | 1,751 |
| | | Business mileage | tCO2e | 331 | 494 |
| | | Total | tCO2e | 1,903 | 2,245 |
| | Fugitive emissions | Venting (compressor only) | tCO2e | 52,025 | 51,252 |
| | | Leak Detection and Repair | tCO2e | Not reported | 1,039 |
| | | Total | tCO2e | 52,025 | 52,292 |
| | Fuel combustion | Diesel | tCO2e | | |
| | | Natural Gas | tCO2e | 223,287 | 208,051 |
| | | Other fuels (as applicable) | tCO2e | | |
| | | Total | tCO2e | 223,287 | 208,051 |
| | Total Scope 1 | | | tCO2e | 277,768 |
| Scope 2 | Electricity consumption | Electricity consumption | tCO2e | 33,323 | 33,612 |
| | | Total | tCO2e | 33,323 | 33,612 |
| | Total Scope 2 | | | tCO2e | 33,323 |
| Total Scope 1+2 | Total scope 1 + 2 BCF (excluding shrinkage) | | tCO2e | 311,091 | 296,524 |

Figure 7: BCF Scope 1 and 2 emissions, FY 2020/2021, and FY 2021/2022. Reported in RRP submission to Ofgem July 2022.

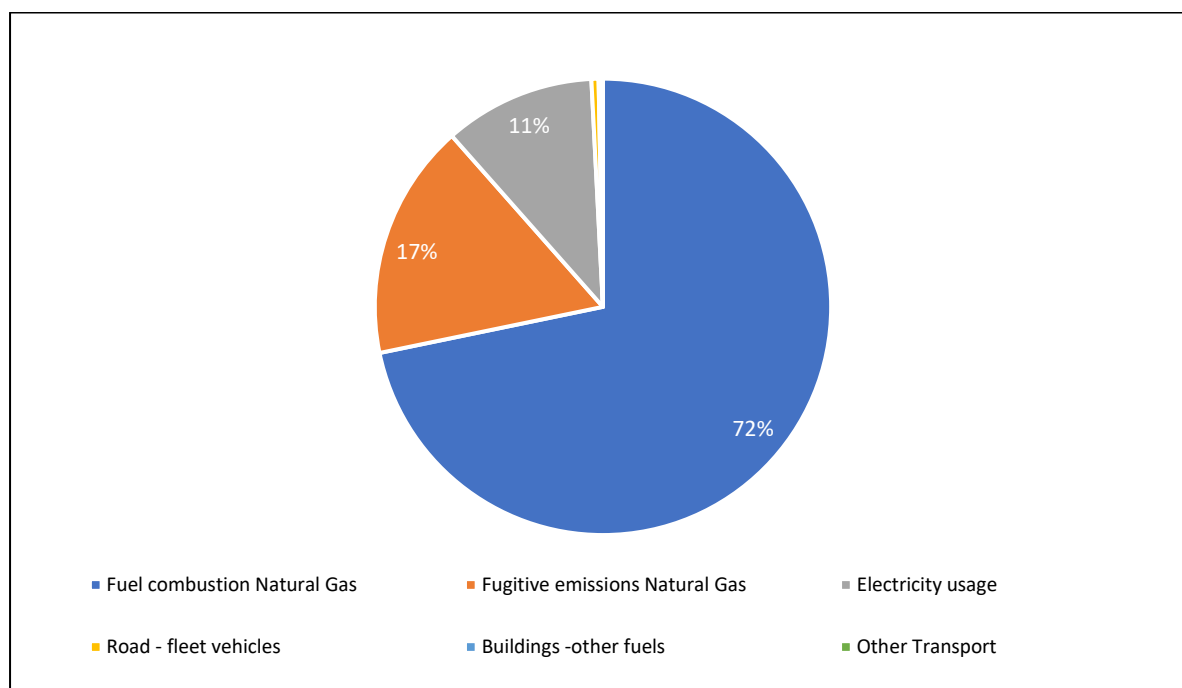


Figure 8: Composition of total Scope 1 and 2 emissions as defined in the BCF for FY 2021/2022

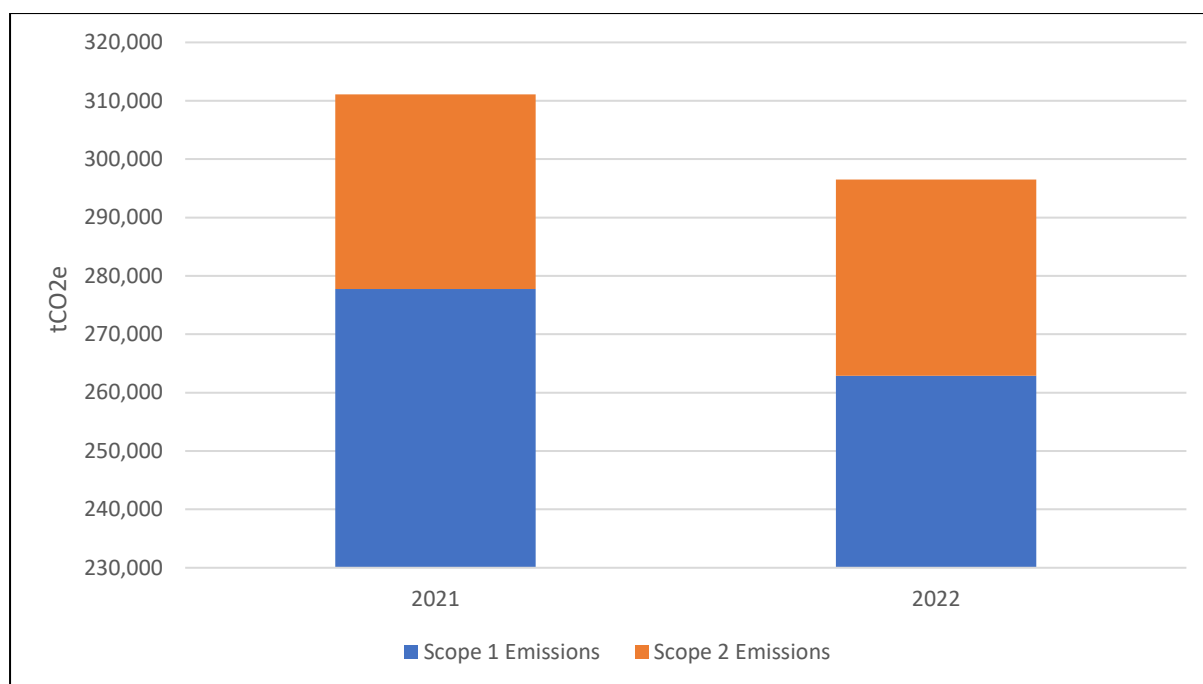


Figure 9: Composition of total Scope 1 and 2 emissions as defined in the BCF for FY 2021/2022

Reducing Methane Emissions (CO2e)

We are currently incentivised to reduce methane from compressor venting activities through our GHG incentive. This is a downside-only incentive that converts methane emissions into CO2e and uses a non-traded carbon price. It is challenging to consistently reduce methane from compressor venting activities due to fluctuations in supply and demand patterns and the needs of our customers. This can lead to higher than anticipated emissions in relation to this incentive and the subsequent incurrence of financial penalties.

Global Methane Pledge and Reducing Methane Leaks across the NTS

Despite challenges in reducing methane emissions from venting, we are committed to tackling this powerful GHG, and, to demonstrate this commitment, in 2021 we aligned with the Global Methane Pledge. The encourages countries to work together to collectively reduce methane emissions by at least 30% below 2020 levels by 2030. To fulfil this Pledge, we are working with Ofgem to implement a plan to reduce methane emissions and increase detection of leaks across the NTS under our Methane Emissions Reduction Campaign (MERC). Initial activity under MERC is working to establish a baseline for methane emissions leaks within the NTS through improved monitoring during RIIO-T2. We will use this baseline to shape our future MERC delivery plan.

Our Scope 1 reporting includes emissions data from our leak detection and repair programme, which is carried out in accordance with current leak detection survey policy requirements, with a rolling four-yearly programme of surveying compressor station periodic fugitive emissions. Within MERC, we are proposing to expand the current monitoring process to include all above ground installations on the NTS. This will provide a measurement-based fugitive emission performance baseline which will enable targeted investment in future price controls and robust tracking of fugitive emission performance.

Shrinkage

NTS Shrinkage is energy used in operating the system and other energy which can't be charged to consumers or accounted for in the measurement and allocation process. NTS Shrinkage contains three

components: Compressor Fuel Usage (the energy used to run compressors), Calorific Value Shrinkage (energy which cannot be billed due to CV capping) and Unaccounted for Gas (gas that is lost or otherwise not accounted for, as delivered to, or off taken from, the NTS).

Shrinkage represents a financial and environmental cost to consumers, both in terms of cost for all elements and methane lost to atmosphere resulting from the ownership, maintenance, and operation of the NTS. During RIIO-T1, we were incentivised to reduce the cost of shrinkage to align our interests with those of the end consumer. We performed well in reducing these costs during RIIO-T1 by adopting trading/operational strategies, benefiting both the consumer and NGGT. For example, without these actions, costs would have been increased in the range of £3m - £16m in 2017/2018 compared to target.

NGGT will retain the shrinkage incentive scheme with access to seasonal markets to drive further consumer savings throughout RIIO-T2. The incentive requires us to manage shrinkage to minimise consumer cost exposure by procuring shrinkage energy at below average market price. This aligns our interests with those of consumers to minimise the cost of shrinkage.

A review of NGGT Unaccounted for Gas (UAG) management since the start of the RIIO-T1 can be found in Appendix D - UAGCVS Report: Unaccounted for Gas and our Calorific Value Shrinkage. This report also contains our Calorific Value Shrinkage (CVS) statement with an overview of possible causes. The report concludes that the total assessed UAG quantity for the October 2021 to March 2022 period is greater than the previous six-month period. Monthly assessed UAG is also greater than the long-term average (April 2013 to March 2022) for four of the last six months, which is in line with increased NTS gas throughput during the Winter period compared with the annual average.

We have continued to improve our understanding of the causes of UAG by using data visualisation tools and investigative projects. CVS has increased in FY 2021/2022 when compared to the previous year. CV capping has continued to contribute to the increase, which has predominately been witnessed in the north and north east local distribution zones. Continued support from meter owners has enabled NGGT to obtain and review meter validation information for NTS entry and exit facilities. This data is being used to support the identification of causes of UAG, both to enhance NGGT's ability to detect meter error and to inform the preparation of future meter witnessing programmes.

Biomethane and Other Low Carbon Gas Connections FY 2021/2022

We are required to monitor and record requests for connections to other forms of low carbon gas. The table below shows the enquiries we have received during RIIO-T2 to date.

| | Units | FY 2021/2022 | FY 2022/2023 |
|-------------------------------|--------|-----------------|--------------|
| Biomethane Connections | | | |
| Enquiries | Number | 1 | 4 |
| Enquiries accepted | Number | 1 | 2 |
| Connections | Number | 1 | |
| Capacity connected | SCMH | 200/4800scm/day | |
| Average monthly flow rate | SCMH | 0.000868 scm/hr | |
| Volume of biomethane injected | GWh | 0.0009550 | |

Figure 10: Summary of connections activity for low carbon sources of gas

EAP Target Update: Continued participation in the European Union Emissions Trading System (EU-ETS)

We are committed to continuing to participate in the EU-ETS (which from 2021 is UK-ETS) and will use this as an opportunity to provide focus on our CO₂ emissions across the business. We continue to comply with the requirements of the UK ETS. For the reporting year FY 2021/2022, we have undertaken the following actions:

- *Completed all required internal pre-verification and external verification audits of compressor station processes and centrally stored data*
- *Submitted all relevant notifications, permit variations, annual emissions reports and activity level change reports required for all compressor installations*
- *Undertaken assurance of all emissions data by 1st line (NGGT Environmental Engineers), 2nd line (SGS, external UKAS accredited verifiers) and 3rd line (Environmental Regulators) with no non-conformities issued for the reporting year*
- *Retained Verified Opinion Statements and Verified Activity Level Change Report Submissions for all compressor stations*

We will continue to use a single consistent carbon price in our investment decisions for each tonne of controllable CO₂e emitted.

EAP Target Update: Achieve carbon neutral construction for major projects starting in RIIO-T2, further implementing PAS 20260 and PAS 2080

In FY 2021/2022 two major construction schemes have entered the first stages of design - King's Lynn Medium Combustion Plant Directive (MCPD) and Peterborough MCPD. Both schemes have completed initial assessments using the NGGT Carbon Interface Tool (CIT) to compare embodied carbon for the early-stage options. This will be developed further as preferred options are chosen and the projects progress. The CIT is an internally developed tool to measure the carbon footprint of all schemes. It has been created in alignment with Publicly Available Specification (PAS) 2080 (PAS 2080:2016 Carbon Management in Infrastructure) and will be refreshed to capture changes in the 2022 PAS 2080 revision.

Whole Life Carbon

Our policy is to implement carbon pricing in our investment decision-making processes. This means that we consider the capital cost of new assets alongside the carbon cost. This process will be embedded in our business during RIIO-T2.

Embodied Carbon

Embodied carbon is defined by the UK Green Building Council as “the total greenhouse gas emissions (often simplified to “carbon”) generated to produce a built asset. This includes emissions caused by extraction, manufacture/processing, transportation and assembly of every product and element in an asset” (Embodied Carbon developing a client brief [UK-GBC-EC-Developing-Client-Brief.pdf](#))

(ukgbc.org). We are committed to establishing a baseline and a target to reduce embodied carbon in new projects during RIIO-T2 and will report on this in our next AER.

Climate Resilience

Climate change is increasingly impacting every-day life, with disruptive weather events becoming more common. We are aware of the serious risk that climate change poses to the NTS and our operations. During RIIO-T2 we are continuing to survey our assets in accordance with industry standards to support the delivery of a reliable and safe network.

EAP Target Update: Managing Climate Change Risk

In 2020, as part of National Grid Group, NGGT added climate change as a principal risk in the company's risk profile and committed to implement the recommendations of the TCFD in full. We completed a consistent assessment of physical climate change risks to our assets - both now and at future intervals - and commissioned an interactive geographical visualisation tool to show risks for 2°C and 4°C scenarios and several timeframes. It was a step change in National Grid's understanding of risks from climate hazards to our asset base (see Appendix E - NGGT Climate Risk Slide Pack – March 2022)

Climate hazards were defined with threshold-based indicators tailored to National Grid infrastructure, with the assessment informing a wider understanding of overall system vulnerability to the changing climate. The framework did not include criticality, adaptive capacity, or other aspects of risk. The analytical framework adopted was based on the conceptual risk framework set out by the Intergovernmental Panel on Climate Change in their 5th Assessment Report. The assessment identified three high level risks:

- *Risks from river flooding*
- *Risks from coastal flooding*
- *Risks from high temperatures and heatwaves*

Our Climate Change Adaption Report details our strategy to manage climate related risk (see Appendix F - Third Round Climate Change Adaptation Report). Immediate next steps include:

- *Build a NGGT-specific climate change risk model*
- *Review standards and specifications for construction of new assets/plants to ensure resilient operation from the impacts of climate change throughout their life cycle*
- *Remodel the 2008 flood risk assessment using the latest available flood risk mapping*
- *Undertake river scour risk modelling on pipelines at river crossings using the UKCP18 Met Office climate change scenarios to inform future depth of cover inspection regime and mitigation*

Emissions from Transport

With emissions from transport comprising 23% of energy-related carbon emissions globally, we recognise our responsibility in reducing our operational transport emissions. Our ambition is to reduce our operational transport emissions by 30% by the end of RIIO-T2 using various methods including installing telematics on fleet vehicles, reducing our current fleet size, and encouraging the uptake of Electric Vehicles (EV) and Alternatively Fuelled Vehicles (AFV) within our fleet.

EAP Target Update: 30% of our operational fleet replaced with AFV (80 vehicles and charging points at 45 sites)

In FY 2021/2022 we have commenced work to better understand the best vehicle types and areas suitable for AFVs, whether this be EV or Fuel Cell Electric Vehicles (FCEV) when they come to market. As part of this analysis, we consider infrastructure, cost, and operational efficiencies.

We develop our vehicle replacement programme a year in advance, with orders for FY 2021/2022 being placed the previous year. Unfortunately, the vehicle manufacturing industry has been impacted by significant delays due to the global shortage of semiconductor microchips, as well as the impact of the Ukraine-Russia war on vehicle supply chains. These combined factors have meant we have not received, or been invoiced for, any replacement vehicles in FY 2021/2022. We will continue to work with our suppliers to both understand revised timelines and determine how best to proceed with the remainder of our vehicle replacement programme.

AIR QUALITY - COMPRESSOR EMISSIONS**EAP Statement of Intent**

We will work to reduce our NOx emissions from the business by the end of RIIO-T2 and beyond. This includes replacing some of the most-polluting compressors on our network with cleaner technologies, improving local air quality

EAP Commitments and Targets

- Enable reduction in NOx emissions per hour of gas turbine running from the business by the end of RIIO-T2

Update Against Commitments and Targets**Reducing Compressor Emissions**

Our aim is to minimise the emissions resulting from energy use (gas or electricity) at the 23 compression facility sites which manage and maintain gas pressure within the NTS. To facilitate this reduction, we continue to maintain and operate our Best Available Technique (BAT) equipment as the lead units for compression and plan to upgrade or replace compressors as required, across the NTS, during the RIIO-T2 and RIIO-T3 periods.

NB. Compressor emissions data is included within our Scope 1 and 2 emissions reporting. Compressor emissions reduction is measured by the reduction in NOx emissions per hour of gas turbine running and calculated using the average for RIIO-T2 compared to the average for RIIO-T1. Reduction is dependent on supply and demand patterns - based on 2015 - 2019 (RIIO-T1 period), we anticipate the reduction to be around 10% during RIIO-T2.

EAP Target Update: Reduce NOx emissions from compressors

Work is in progress to complete the installation of new compressor units to ensure compliance with the Industrial Emissions Directive (IED) legislation. To meet customer network capability needs, we propose to deliver two new Medium Combustion Plant Directive (MCPD) compliant compressor units at King's Lynn and one unit at Peterborough.

We will continue to replace compressor units, as defined in the Compressor Emissions Compliance Strategy (CECS), during RIIO-T2 and - subject to Front End Engineering Design - commence work to enable the delivery of six new compressors in RIIO-T3. These will help reduce NOx emissions into RIIO-T3 and beyond.

In total, we spent £279.7m on compressor emissions compliance in RIIO-T1, whilst in RIIO-T2 the total allocated spend is £156.7m. During the RIIO-T1 period we achieved derogations for several units which allowed us to deliver the required network capability in a cost-effective manner, whilst continuing to meet legislative requirements. As a result of the successful derogation request during RIIO-T1, we have been able to plan further capital works across RIIO-T2 and RIIO-T3 whilst ensuring outages can be scheduled in a way that ensures minimal disruption and cost to consumers.

Our CECS will ensure the most polluting compressor trains are decommissioned and replaced where necessary with cleaner machinery, whilst utilising a reopener mechanism - where there is uncertainty around solutions and financial impact - ensures the most cost-effective solution is taken forward.

RESPONSIBLE ASSET USE:

EAP Statement of Intent

We will address redundant assets, asset groups or sites, supporting a sustainable lower carbon future through responsible demolition including asset repurposing

EAP Commitments and Targets

- Implement the ISO 20400 sustainable sourcing process
- Reduce the waste intensity of our construction projects year-on-year based on a 2019/2020 baseline
- Construction projects: zero waste to landfill from 2022/2023 and increase the recycling or reuse of materials
- Construction projects: increase the proportion of recycled materials used on construction projects during RIIO-T2
- Pilot and implement circular economy principles for raw materials, goods procured and existing assets
- Address 84 redundant assets, asset groups or sites in RIIO-T2
- Extend the life of equipment where appropriate by refurbishment
- Reduce the waste we create at our offices (waste tonnage) by 20%
- Recycle 60% of our office waste by 2026
- Reduce water use in our offices by 20%

Update Against Commitments and Targets

Sustainable Procurement, Resource Use and Waste

There are clear links between measures taken to improve resource efficiency and those to minimise waste. We are committed to adopting circular economy principles to asset management and materials use. The EAP commitments focus on responsible asset usage which will provide positive outcomes for the management of our natural resources.

Sustainable Procurement and the Supply Chain:

In RIIO-T1, National Grid included sustainability and in particular carbon, in tenders totalling over £500m. The weighting of the questions was awarded 5%. It was established that for every 10% of carbon reduced in the design, there was a 6% cost reduction.

During RIIO-T2 a common set of sustainability questions has been established for all tender events and the weighting increased to 10%. We will continue to work with the Sustainability Supply Chain School members, both clients and suppliers, to maximise opportunities for the industry to drive down carbon in their supply chains.

We are active members in external collaborations focusing on utilising and standardising the use of sustainable materials. As members of the Major Infrastructure Resource Optimisation Group, we promote the expansion of circular economy principles.

EAP Target Update: Implement the ISO 20400 sustainable sourcing process

We intend to demonstrate compliance to the ISO 20400 sustainable sourcing process standard, beginning with an internal assurance audit in FY 2023/2024.

EAP Target Update: 75% of National Grid's Top 250 Suppliers (by Category/Spend) will have carbon reduction targets

NGGT engages with 250 of our most carbon-intensive global suppliers annually with a target of 75% of the top suppliers having carbon reduction targets. We achieved 74% in FY 2021/2022. We work collaboratively across our industry to share best practice in this space, and we are members of initiatives such as the Supply Chain Sustainability School, United Nations Global Compact and Achilles UVDB, among others.

Waste and Recycling:

EAP Target Update: Construction projects: zero waste to landfill from FY 2022/2023 and increase the recycling or reuse of materials

NGGT contractors are proactively managing their waste and reporting through a Contractor Sustainability Portal which has recorded 99% of waste as being diverted from landfill in FY 2021/2022. The recorded recycling rate is 97%. Once the data has been verified, a baseline will be established, and targets communicated for future years.

EAP Target Update: Reduce the waste we create at our offices (waste tonnage) by 20% and recycle 60% of our office waste by 2026

With waste streams already segregated at a basic level, we have begun further segregation of waste streams to reduce contamination of dry mixed recycling and increase recycling recovery rates. This activity builds on a National Grid Group waste and recycling campaign which included improving signage and addressing behavioural issues amongst employees. Recycling figures - and the percentage of waste streams in each category diverted to landfill - will be verified next financial year, with a baseline and annual targets subsequently set by waste stream.

Following a trial of food waste caddies within a section of National Grid House (NGH), we are looking at extending this across NGH. As the restaurant already sends their food waste for anaerobic digestion, this initiative aims to target items such as tea bags, fruit peelings/cores used on the floorplates and transfer these items from general waste to organic waste.

CARING FOR THE NATURAL ENVIRONMENT

EAP Statement of Intent

We will 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

EAP Commitments and Targets

- 10% increase in environmental value on all non-operational land
- Act as custodians of our redundant sites by ensuring we reinstate them to a Net Gain in environmental value
- Deliver 10% Net Gain in environmental value (including biodiversity) on all planned construction projects
- Educate the public about environmental issues through outreach linked to major compressor emissions projects

Update Against Commitments and Targets

Local Environment

NGGT has a significant landholding, with our area of operational and non-operational land totalling 1,174.75 hectares. Following assessments of all NGGT land in FY 2021/2022, we have established the total habitat area is 878.16 hectares and we have a baseline of 4,165.61 biodiversity units.

We are committed to ensuring new construction and demolition projects include initiatives to protect and promote biodiversity, and to enhancing the value of natural assets on non-operational land. Each year the AER will report on the planning process and successes of our mitigation plans to ensure the Biodiversity Net Gain (BNG) units.

All NGGT construction schemes invest in the local community to enhance/restore local environmental quality. Natural capital and biodiversity assessments will be carried out on all construction schemes using a National Grid natural capital tool and a DEFRA biodiversity tool. When an impact is recorded, the scheme will mitigate the impact and further enhance the area by 10%.

EAP Target Update: 10% increase in environmental value on all non-operational land

The St Fergus Future Operating Strategy, King's Lynn MCPD Project and Peterborough MCPD Project have completed BNG assessments to support their initial options assessments. The BNG assessments will be refined and updated once preferred options are chosen and the projects progress - this will include appropriate habitat assessments to better understand the baseline conditions. The Hatton Project results in the loss of three Biodiversity Units and a project is in discussion with the Lincolnshire Chalk Streams Trust to address this negative impact.

NGGT's Pipelines Maintenance Centre (PMC) specialises in gas pipeline repair, replacement, maintenance, and intervention to deliver in-field solutions to a range of emergency and planned projects across the gas pipeline network. PMC, in addition to Gas Construction, has completed BNG assessments across their operational project portfolio.

A summary of Operational and PMC assessments is below:

| Project name and PC type | Total number of sites | BNG baseline - Total units on site - from DEFRA tools | BNG units required (10%) |
|---------------------------------|------------------------------|--|---------------------------------|
| PMC NARC | 49 | 10.092 | 1.4937 |
| TR1 NARC | 16 | 8.6328 | 0.8873 |
| TR1 ISS | 4 | 22.25 | 1.846 |
| Totals | 69 | 40.9748 | 4.227 |

Figure 11: BNG Assessments - NB. NARC sites have used the BNG small sites assessment tool while ISS BNG has been calculated using the Biodiversity Metric Tool v3.

EAP Target Update: Educate the public about environmental issues through outreach linked to major compressor emissions projects

Our Hatton site is located in rural Lincolnshire and does not have many direct site neighbours or significant local communities - the nearest village is located three miles from the site. To effectively engage with nearby communities, we are collaborating with local third parties with existing networks to deliver a variety of outreach activities including:

- **Education:** In partnership with the local school, we plan to run a Community Energy Fun Day. The day will include information relating to the work at Hatton and emission reductions resulting from the Project. The event will reach both students and their parents, delivering energy efficiency information and advice. Such events are easily scalable and could be offered to other schools across the East Lindsey District Council area to the east of the site.
- **Energy Advice:** Local Housing Associations work closely with their communities and often their residents are low-income families. Working in partnership with a local energy efficiency and fuel poverty advice provider, we can help deliver resources directly to those who would benefit the most. The Project can deliver 'Keep Warm and Healthy' sessions for residents identified by the partner Housing Association.

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. Our FY 2021/2022 environmental incidents are reported below. Of the 53 total incidents, 3 were reported to the Environment Agency/the Scottish Environmental Protection Agency 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.

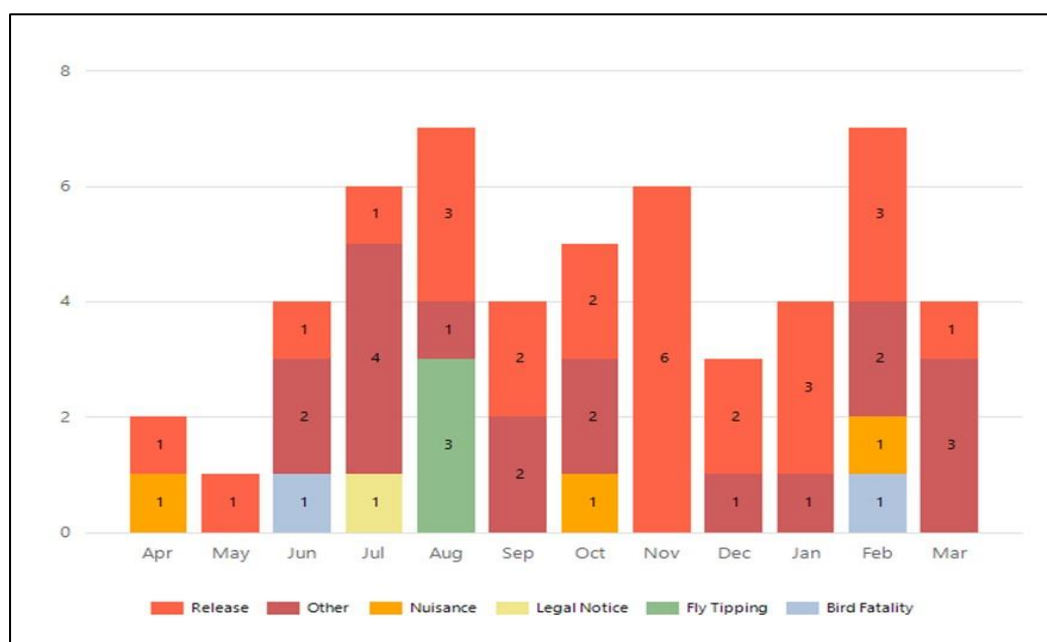


Figure 12: NGGT environmental incidents during FY 2021/2022

LEADERSHIP FOR CHANGE

EAP Statement of Intent

We will embed sustainability in our decision making, be transparent on our progress, and work with industry to drive forward the sustainability agenda

EAP Commitments and Targets

- An engaged workforce on environmental issues that leads by example
- Sustainability is fully embedded in our decision making
- Produce an AER (including BCF reporting)
- We will lead in transparency on capital carbon and natural capital using data and tools to collaborate and drive environmental progress

Update Against Commitments and Targets:

In our EAP we commit to demonstrating organisational leadership and making the right strategic choices to drive change for better environmental outcomes. To achieve this, we are working to embed

sustainability in our decision making, be transparent on our progress, and work with the wider energy industry to drive forward the sustainability agenda.

We actively participate in energy industry groups to reduce the UK GHG emissions, minimise resource usage and enhance our natural environment. Our carbon and natural capital tools are shared within the energy industry via various working groups, forums and knowledge sharing events, such as the Net Zero Infrastructure Industry Coalition and Major Infrastructure Resource Optimisation Group.

EAP Target Update: An engaged workforce on environmental issues that leads by example

As part of our strategic business priority - driving a positive environmental and community impact - we want to have a lasting and positive effect on both the environment and society. That's why we encourage our employees to share their skills, time and expertise through employer supported volunteering. Getting involved in volunteering provides opportunities for employees to make a difference in their local communities, as well as acquire new skills and knowledge which benefit both the individual and the wider business. Employees can support team volunteering activities located in the vicinity of our operations that bring social, economic and/or environmental benefits for charities, community groups and not-for-profit groups.

Through the employee volunteering programme, NGGT colleagues have been working with The Conservation Volunteers - an organisation dedicated to connecting people and green spaces - to enhance the natural environment at our operational sites. An example of this was the establishing of a new hedgerow as part of a 10-year commitment at our Aylesbury Compressor Station to deliver new habitats and enhance biodiversity by creating hedgerows, woodland, wildflower grasslands, and a composting area.

SECTION 4: INNOVATING FOR DECARBONISATION

Our Pathway to Decarbonisation

During RIIO-T2 we will lead the development of options for decarbonisation of the gas transmission system to facilitate the decarbonisation of heat, power, industry, and transport, including collaborating with others on an agreed hydrogen workplan.

To decarbonise heat and power, we believe a mix of hydrogen, green (renewable) gas and renewable electricity generation will be required. We are working to ensure our network can support a hydrogen economy, maximise the use of green gases and facilitate generation with carbon capture usage and storage (CCUS), and continue to provide security of supply resilience to back up renewable electricity generation.

- To accelerate our move towards decarbonisation we will continue to:
- Trial new materials and construction techniques which offer environmental savings, whilst embedding those that have been successful in RIIO-T1
- Strive to be early adopters of hydrogen within the transport and industrial sectors
- Carry out Impact Assessment of emissions and leakage rates from a hydrogen compatible network
- Undertake intelligent leak detection on sites and pipelines
- Design and construct new infrastructure to minimise our BCF
- Use CCUS to reduce our BCF
- Engage innovatively with communities through augmented reality on major construction projects
- Develop innovative communication at our environmental Education Centres
- Seek alternatives for redundant sites related to hydrogen and CCUS innovation, for example, the transformation of the Theddlethorpe Terminal for hydrogen production or CCUS
- Develop commercial and asset related requirements for future hydrogen customer connections
- Undertake Impact Assessments of hydrogen blending for existing connection assets

Hydrogen Transition

We believe low carbon hydrogen will be essential to achieving a clean energy future, accounting for between 20% and 35% of the 2050 energy mix. The development of a hydrogen transmission network to connect future supply and demand is fundamental for a future hydrogen system to deliver the UK Hydrogen Strategy. At NGGT, we recognise we have a crucial role to play in this endeavour and will lead a fair energy transition for all in the UK. We will do that by developing the green gas system of tomorrow while delivering the natural gas needs of today.

Our HyNTS programme (Hydrogen in the National Transmission System) is focused on understanding how we can safely and efficiently transition our network to hydrogen. Converting our NTS to transport hydrogen would minimise disruption and reduce the amount of expensive infrastructure needed to build a new hydrogen transmission network. We have already run several projects looking into the physical capabilities of the NTS to deliver hydrogen transportation. These projects have not just looked at the impact hydrogen could have on our pipework, but on all associated equipment such as compressors and valves, as well as the ways that a hydrogen network may need to operate differently in the future.

Below, we detail our innovation projects that will help us transition to a hydrogen NTS:

FutureGrid

FutureGrid is a key part of our HyNTS programme. The project is testing the suitability of the NTS to transport hydrogen, by constructing an offline hydrogen test facility, representative of our network, which will be used to test decommissioned assets at a range of different hydrogen concentrations (including 2%, 20% and 100%). Located in Cumbria, the project started in April 2021 with funding from Ofgem's Network Innovation Competition and is expected to be complete by August 2023. There is a fundamental difference between how natural gas and hydrogen behaves. 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.

The project has several contributing partners - DNV, Northern Gas Networks, the Health and Safety Executive Science Division, Fluxys (the equivalent Gas Transmission Operator in Belgium), Durham University and the University of Edinburgh.

Project Union

Project Union will connect, enable net zero, and empower a UK hydrogen economy by developing a c.2,000km UK hydrogen 'backbone' by the early 2030's. This will involve connecting strategic production and storage locations with key users, for example, Industrial Clusters, power stations and hydrogen towns around the country and would repurpose around 25% of the current gas transmission pipelines.

We believe that Project Union will support market growth, enable low carbon hydrogen to grow from fragmented initial stages to a highly integrated, competitive, transparent, and liquid end state with the scope to optimise export/import opportunities to Europe.

East Coast Hydrogen

We are also working to demonstrate the potential for a regional roll out of hydrogen networks. East Coast Hydrogen, a project with Cadent and Northern Gas Networks, will act as a blueprint to convert UK regions to hydrogen. East Coast Hydrogen will build on the first phase of Project Union which will join Teesside and Humber within the East Coast Cluster- and roll out through local towns by repurposing existing infrastructure and building new hydrogen infrastructure.

Benefits of Repurposing the NTS for Hydrogen

A shared hydrogen network can unlock the hydrogen economy and deliver the following benefits for the UK:

- Energy resilience and security

The UK will require around 100TWh of hydrogen for inter-seasonal energy storage by 2050. Currently, there is no other option for storing sufficient energy. A hydrogen transmission system is required to provide system resilience to move sufficient volumes in the network. Furthermore, intra-day energy storage requires 'line-pack' (this is the amount of gas within the NTS at any time) to manage intermittent renewable supply and demand.

- Levelling up, job creation

The NTS will provide fair access to hydrogen infrastructure across the UK and enable existing industries to decarbonise and continue to attract capital as global investors target net zero. In addition, it will enable the hydrogen and CCUS economies, with potential for creating over 100,000 jobs by 2050. Beyond this, we are excited about the potential of hydrogen when it comes to re-training and upskilling the existing workforce within the wider gas sector – for example, the 130,000 gas engineers currently employed across the United Kingdom.

- Connect regions

A hydrogen transmission system connects green (using electrolysis) and blue (using gas) hydrogen projects with the wider market - enabling greater system efficiency through co-ordinated and shared infrastructure. Without a hydrogen transmission system, each cluster and project will require independent capacity to handle peak demand, resulting in over-built, duplicate transmission and storage systems.

- Decarbonising industry

Around 50% of industrial emissions are outside of the Industrial Clusters and without national transmission of hydrogen, we will miss industrial net zero targets. A national hydrogen transmission system will provide fair access to green and blue hydrogen for these sites and allow them to decarbonise.

- Creating a market

A hydrogen transmission system connects isolated production sites to enable competition, driving costs down for consumers. It also provides access for producers to larger markets, enabling faster scale-up and transition to net zero. In support of the Government's Hydrogen Strategy, it will additionally enable access to import/export opportunities to Europe and Ireland by the mid-2030s.

- Global leader in green innovation

The UK has an opportunity to position itself as a global leader in green innovation in a rapidly growing hydrogen economy. A hydrogen transmission system could facilitate this by supporting the early emergence and growth of the market. It could also attract technology developers and global investors by getting the best value from our national infrastructure - all of which will enable a rapid scale-up of a UK hydrogen industry, with the opportunity to export hydrogen capability globally.

Summary

We believe hydrogen will be an integral part of the UK's energy mix for decades to come and we want to be at the forefront of delivering the benefits of connecting supply and demand.

With hydrogen, we can underpin the transition to renewable sources like wind and solar - in the depths of winter when sunlight is at a premium and height of summer when the wind is not blowing. The production of hydrogen is also a key element of this work - excess energy produced by renewable sources can be diverted into the creation of hydrogen gas rather than paying producers to constrain their production. When it comes to moving this gas around the country, only we can provide the economies of scale required for delivering a properly flexible energy system and realising our net zero ambitions.

By pivoting to hydrogen, we can also safeguard the high-skilled jobs we support for the future and avoid expensive re-training or even redundancy. As well as this, hydrogen has a knock-on impact on other major issues that relate to our climate goals, for example domestic heating. The solution to the challenge of domestic heating is an integrated one - we should think about how to look at electricity and gas, including hydrogen, together with immediate measures we can take like improving insulation for new and old homes.

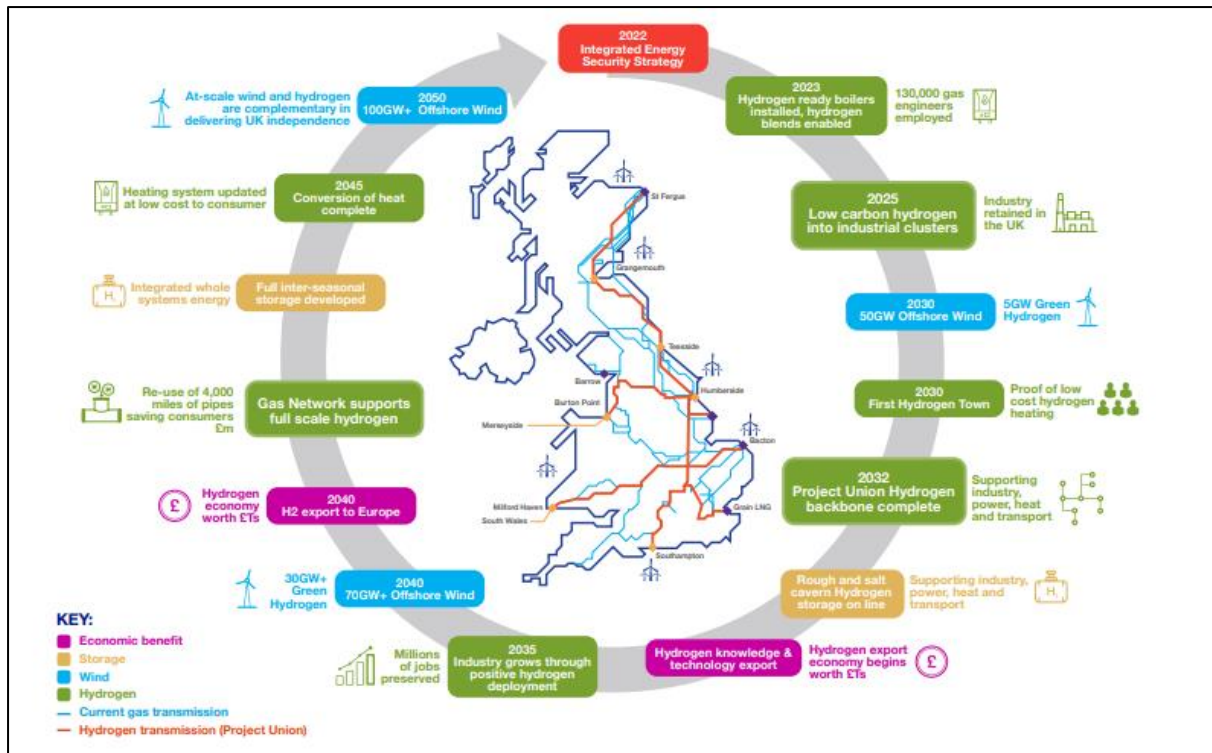


Figure 13: Hydrogen roadmap: delivering clean energy independence for the UK

For more information regarding our hydrogen plans see Appendix G - HyNTS: Hydrogen in the NTS / FutureGrid overview - March 2022.

SECTION 5: STATEMENT ON SCOPE AND QUALITY OF DATA

Statement on the Scope and Quality Of Data

NGGT reports Scope 1 and 2 GHG emissions through the Regulatory Reporting Process (RRP). In addition, we have developed an EAP with clear commitments and targets. A detailed milestone plan for the delivery of each of the commitments is currently under development.

We have agreed with Ofgem an environment RIIO-T2 Output Delivery Incentives (ODI) scorecard to encourage us to improve the environment beyond the existing commitments in our EAP. The environmental ODI scorecard covers the measurable parts of our EAP and the existing GHG incentive.

| Number | Metric | | | |
|--------|---|---------------|----------------|--------------|
| | | Penalty level | RIIO-T2 target | Reward level |
| 1 | We will replace 30% of our operational fleet with low carbon alternatives | 25% | 30% | 35% |
| 2 | We will have 75% of our top 250 suppliers with carbon reduction targets | 70% | 75% | 80% |
| 3 | We will recycle 60% of our office waste | 55% | 60% | 65% |
| 4 | We will reduce the waste we create at our offices (waste tonnage) by 20% | 15% | 20% | 25% |
| 5 | We will reduce methane emissions from compressor stacks for operational purposes with a yearly target of 2,987 tonnes | 3,136 | 2,987 | 2,838 |
| 6 | We will reduce our water use at offices by 20% | 15% | 20% | 25% |
| 7 | We will increase the value of natural capital on our non-operational land by 10% | 5% | 10% | 15% |
| 8 | We will ensure a Net Gain target is applied on all schemes that lead to permanent or temporary habitat loss, negative impacts on the habitat condition or provision of ecosystem function e.g., screening, flood management, recreation | -4% | 1% | 6% |

Figure 14: Environmental ODI scorecard metrics

Data Quality

The validation of the RRP data is assured by NGGT and we consider our governance process for RRP provides consistent and robust coverage for the sign off data assurance activities stipulated by Ofgem.

Furthermore, each EAP target has an accountable manager who reviews and approves the annual performance information. This performance information is reported in the AER which is reviewed internally and approved by senior management.

During preparation of this AER, we have endeavoured to ensure that:

- The reported data is accurate and meaningful
- The reported data reflects our FY 2021/2022 performance and is consistent with the scope of requirements detailed in the Ofgem guidance - RIIO-T2 Environmental Reporting
- The assumptions made regarding our calculation and measurement methods are clear and detailed in the Methodology Annex document

Methodology and Reporting Units for Embodied Carbon

To ensure consistency in reporting and use of terminology, embodied carbon is captured in an internally developed Carbon Interface Tool (CIT) which has been verified by the National Physical Laboratories. It has been created in alignment with Publicly Available Specification (PAS) 2080 (PAS 2080:2016 Carbon Management in Infrastructure) and will be refreshed to capture changes in the 2022 PAS 2080 revision.

Carbon footprints are measured at each stage of the network development process and a carbon intensity figure reported using the metric tCO₂e/£m as the default embodied carbon reporting unit. Reductions in carbon are directly related to actions taken, for example changes to design, material selection and/or optioneering.

Management Review

The main roles are as follows. These are the minimum requirement for assurance purposes and apply to the full AER:

- Data Provider: has in-depth knowledge of the data and is responsible for providing a complete data set to the Level 1 signatory, and providing evidence of the checks performed in support of this
- Level 1 signatory: is considered an 'expert' in understanding the data and is responsible for identifying and performing accuracy checks on the data set and for providing evidence to support this and any conclusions made, including identifying errors or anomalies. This role provides data accuracy comfort to the Level 2 signatory
- Level 2 Senior Manager signatory: is responsible for ensuring the data is consistent with expectations and can be explained in year and across periods. This role reviews the evidence in place to support data accuracy checks and conclusions
- Level 3 Executive Team member: is responsible for overall AER sign off

NB. No independent external assurance review of the AER has taken place in FY 2021/2022. We will reconsider this approach in FY 2022/2023 with the appropriate outcome determined by the level of data available.

Reporting Boundaries

This report provides data and information for the period 1 April 2021 to 31 March 2022 across our NGGT business.

Collaboration to Ensure Consistency in Reporting

We are collaborating with the Scottish Transmission Owners (SPEN and SSEN) and National Grid Electricity Transmission. We have also engaged with the GDNs to ensure consistency in reporting methodology.

SECTION 6: KEY TERMS, ACRONYMS AND DESCRIPTIONS

| TERM | ACRONYM | DESCRIPTION |
|--|---------|---|
| Annual Environmental Report | AER | Report submitted to Ofgem by licensees to ensure they remain accountable on a yearly basis for implementing their RIIO-2 Environmental Action Plan Commitments. |
| Biodiversity Net Gain | BNG | An approach to development, and/or land management, that aims to leave the natural environment in a measurably better state than it was beforehand. |
| Business Carbon Footprint | BCF | Details the impact that our operational activities have on the environment in terms of associated carbon dioxide emissions. We measure and report our BCF using equivalent tonnes of carbon dioxide (tCO ₂ e). |
| Calorific Value Shrinkage | CVS | Energy which cannot be billed due to CV capping under application of the Gas (Calculation of Thermal Energy) Regulations 1996 and subsequently amended in 1997. |
| Climate Change Adaption Report | | Details our strategy to manage climate related risk. |
| Compressor Fuel Usage | CFU | Energy used to run compressors to manage pressures within the gas transmission system. This can either be gas or electricity, depending on the power source for the specific compressor. |
| East Coast Hydrogen | | Part of our HyNTS programme, the project, with Cadent and Northern Gas Networks, will act as a blueprint to convert UK regions to hydrogen. East Coast Hydrogen will build on the first phase of Project Union which will join Teesside and Humber within the East Coast Cluster and roll out through local towns by re-purposing existing infrastructure and building new hydrogen infrastructure. |
| Embodied Carbon | | The total greenhouse gas emissions (often simplified to “carbon”) generated to produce a built asset. This includes emissions caused by extraction, manufacture/processing, transportation and assembly of every product and element in an asset (definition as per UK Green Building Council). |
| Environment RIIO-T2 Output Delivery Incentives scorecard | ODI | Scorecard agreed with Ofgem to encourage us to improve the environment beyond the existing commitments in our EAP. |
| Environmental Action Plan | EAP | Plan outlining our approach to environmental management and environmental performance during RIIO-2. The plan was formed from our Business Plan Commitments and consists of specific targets under five pillars, with clear accountabilities and work programmes, which will drive improved environmental performance. |
| European Union Emissions Trading System | EU-ETS | Set up in 2005, the EU ETS is the world's first international emissions trading system. A UK Emissions Trading Scheme (UK ETS) replaced the UK's participation in the EU ETS on 1 January 2021. |
| FutureGrid | | Part of our HyNTS programme, the project is testing the suitability of the NTS to transport hydrogen, by constructing an offline hydrogen test facility, representative of our |

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| | | network, which will be used to test decommissioned assets at a range of different hydrogen concentrations (including 2%, 20% and 100%). |
| Gas Distribution Networks | GDNs | Transport gas through their pipelines to end users. There are eight gas distribution networks, each of which covers a separate geographical region of Great Britain. Since GDNs are natural monopolies they are regulated by Ofgem. For GDNs to legally distribute gas, they must hold a Gas Transporter Licence. |
| Global Methane Pledge | | Encourages countries to work together to collectively reduce methane emissions by at least 30% below 2020 levels by 2030. |
| HyNTS programme | | Hydrogen in the National Transmission System is focused on understanding how we can safely and efficiently transition our network to hydrogen. |
| ISO 20400 | | Sustainable sourcing process providing guidance to organisations on integrating sustainability within procurement, as described in ISO 26000. |
| Materiality | | The process undertaken to determine which environmental issues are of sufficient importance to form part of the EAP. |
| Methane Emissions Reduction Campaign | MERC | Work programme with Ofgem to implement a plan to reduce methane emissions and increase detection of leaks across the NTS during RIIO-T2. |
| Methodology Annex Document | | Describes the scope and boundaries of our environmental commitments, along with the assumptions made regarding our calculation and measurement methods. |
| National Grid Gas Transmission | NGGT | Part of National Grid Gas plc. NGGT owns and operates the regulated gas National Transmission System (NTS) in Great Britain and owns an independent gas metering business. As both the transmission owner and system operator, NGGT owns, builds, and operates the high-pressure NTS with day-to-day responsibility for balancing supply and demand in real time, and facilitating the connection of assets to the NTS. |
| NGGT Carbon Interface Tool | CIT | An internally developed tool to measure the carbon footprint of all schemes. It has been created in alignment with Publicly Available Specification (PAS) 2080 (PAS 2080:2016 Carbon Management in Infrastructure) and will be refreshed to capture changes in the 2022 PAS 2080 revision. |
| NGGT Pipelines Maintenance Centre | PMC | Specialises in gas pipeline repair, replacement, maintenance, and intervention to deliver in-field solutions to a range of emergency and planned projects across the gas pipeline network. |
| Project Union | | Part of our HyNTS programme, the project will connect, enable net zero, and empower a UK hydrogen economy by developing a c.2,000km UK hydrogen 'backbone' by the early 2030's. |
| RIIO Price Control Framework | | Revenue = incentives + innovation + outputs. The price control framework for high pressure gas transmission networks which lasts for five years. RIIO-T1 ran from 2013-2021. RIIO-T2 started on 1 April 2021 and runs until 31 March 2026. |
| Science-Based Target Initiative | SBTi | The SBTi defines and promotes best practice in science-based target setting. SBTs provide a clearly defined pathway for a business to reduce their greenhouse gas emissions, helping to |

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| | | prevent the worst impacts of climate change and future-proof business growth. Targets are considered 'science-based' if they are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement - limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C. |
| Scope 1, 2 and 3 Emissions | | Scope 1 covers emissions from sources that an organisation owns or controls directly. Scope 2 covers emissions that a company causes indirectly when the energy it purchases, and uses, is produced. Scope 3 emissions are a consequence of the activities of the company but occur from sources not owned or controlled by it and instead by those that it's indirectly responsible for, up and down its value chain. Scope 3 emissions include all sources not within the Scope 1 and 2 boundaries. |
| Shrinkage | | Energy used in operating the NTS and other energy which can't be charged to consumers or accounted for in the measurement and allocation process. NTS Shrinkage contains three components: Compressor Fuel Usage, Calorific Value Shrinkage and Unaccounted for Gas. |
| Task Force on Climate-related Financial Disclosure | TCFD | Framework for consistent climate-related financial risk disclosures for use by companies, banks, and investors in providing information to stakeholders. Created by The Financial Stability Board to improve and increase reporting of climate-related financial information. |
| Unaccounted for Gas | UAG | Gas that is lost, or otherwise not accounted for, as delivered to, or off taken from, the NTS. It is one of the components of NTS shrinkage. |

SECTION 7: APPENDICES

Appendix A: Methodology Annex Document (data lake)

Appendix B: NGGT Environmental Action Plan

Appendix C: Performance Tables

Appendix D: UAGCVS Report - Unaccounted for Gas and our Calorific Value Shrinkage

Appendix E: NGGT Climate Risk Slide Pack – March 2022

Appendix F: Third Round Climate Change Adaptation Report

Appendix G: HyNTS: Hydrogen in the NTS / FutureGrid Overview - March 2022