



NZASP Submission

# Methane emissions Common Elements October 2022

**nationalgrid**

NGGT METHANE REOPENER APPLICATION  
COMMON ELEMENTS DOCUMENT – OCTOBER 2022.

## Document control

Version	Status	Date	Author(s)	Summary of changes
0.1	Draft (trigger document)	July-22	Matthew Williams	
0.2	Draft (final submission – single UM document)	Sept-22	Matthew Williams, Jai Dalal, Guy Pearson, Mark Lees, Raveena Virk	Updated to take in Ofgem feedback, revised business cases, refinement of cost data, new executive summary and more complete regulatory input
0.3	Final document	Oct-22	Matthew Williams, Jai Dalal, Guy Pearson, Mark Lees, Raveena Virk	Updated to take in Ofgem feedback and first pass of sign-off comments Amendment of submission to split into three by investment theme. Common elements to all themes to be appended to individual theme submission papers.

## Supporting Documents

Document	File Name
Director of Regulation Assurance Statement	NG-Asset-GT-MR-COM-001-Assurance Statement
Regulation Table Mapping	NG-Asset-GT-MR-COM-002-Table Mapping

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## Reviewers

Name	Organisation	Content/DAG assurance	Role Title	Review Date
Raveena Virk	NGGT	Content	Regulatory Development Manager	7/10/22
Raveena Virk	NGGT	DAG	Regulatory Development Manager	5/10/22
Andrea Hamilton	NGGT	DAG	Senior Assurance Engineer	4/10/22

## Management approval

Name	Organisation	Content/DAG assurance	Role Title	Approval Date
Clare Middleton	NGGT	Content	Head of SHE	11/10/22
Clare Middleton	NGGT	DAG	Head of SHE	5/10/22
Mark Amos	NGGT	Content	Head of Asset Strategy	17/10/22
Mark Amos	NGGT	DAG	Head of Asset Strategy	6/10/22
Neil Rowley	NGGT	Content	Regulatory Strategy Manager	9/10/22
Neil Rowley	NGGT	DAG	Regulatory Strategy Manager	11/10/22
Steve R Fisher	NGGT	Content	Head of Commercial and Incentives	4/10/22
Neil Sorrell	NGGT	Content	Network Strategy Manager	5/10/22
Darren Christie	NGGT	Content (Financials)	Senior Finance Business Partner	18/10/22
David Ashton	NGGT	Content (Financials)	Finance Business Partner	18/10/22

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## 1 Executive summary

This document, together with its appendices and attached supporting information, comprises National Grid Gas Transmission's (NGGT) core document submission under the Net Zero Pre-construction Work and Small Net Zero Projects Re-opener (NZASP) to address methane emissions from operating the Gas National Transmission System (NTS). NGGT seeks funding for methane emission reduction equipment or assets and improved fugitive gas escape detection split across three themes. Each theme paper will be submitted separately and Ofgem should consider each theme as an individual submission under the NZASP re-opener mechanism, with this core document providing the common narrative applicable to all. The three key themes are:

- Mobile Recompression
- Compressor Machinery Train
- Detection and Analytics

A focus on methane emissions from the oil and gas industry, including the natural gas supply chain, culminated in the commitments made by signatories to the Global Methane Pledge, agreed at COP26 in Glasgow in November 2021. The UK government, along with 121 other country signatories, recognise that fast action to reduce global methane emissions keeps the goal of limiting global temperature rises to 1.5 degrees centigrade within reach and as such helps to mitigate the worst consequences of climate change. By committing to this Pledge, the UK has agreed to cut its methane emissions by 30% by 2030 from a 2020 baseline. These commitments align with, and contribute to, National Grid Group's (NGG) target to reach net zero direct greenhouse gas emissions by 2050.

As the operator of the UK NTS, NGGT plays a critical role in the UK natural gas supply chain, transporting predominantly methane gas from beach landing points at gas terminals and LNG terminals, operated by other parties, to industrial users, power generators and household consumers, via the gas distribution networks. This submission under the NZASP re-opener allows NGGT to start to reduce known methane emissions arising from operating the NTS, while also establishing a measurement-based fugitive methane emission performance baseline. Through these investments, NGGT will aim to implement methane emission reduction measures, which are responsible for 56% of the total emissions from operating the NTS.

In the development of its submissions, NGGT has held both an open public webinar and targeted stakeholder engagement sessions to test the proposal content and to obtain views on the value for money relative to the emission reductions that may be realised from the investments. Additionally, NGGT has worked collaboratively with Ofgem in the development of this submission, with regular challenge and review sessions to build and refine the content. NGGT has considered a wide range of options under the different investment themes within the submission and has outlined these during regular engagement with Ofgem, along with NGGT's selection criteria for the preferred option.

Based on the understanding of its methane emission performance that NGGT has today, this submission and funding request will allow a reduction of up to 15% of methane emissions from operating the NTS within the RIIO-2 period and significantly impact compressor venting (currently 41% of RIIO-2 methane emissions) in RIIO-3, pending successful trials of emission reduction technology. This equates to a potential monetised annual emission reduction of £4.37m in the RIIO-2 period and £11.97m annual emission reduction in RIIO-3.

## 2 Assessment phase submission outline

NGGT is submitting three investment proposals to address methane emissions from operating the NTS. These submissions cover three themes:

- Mobile recompression - Additional mobile pipeline recompression capability and new mobile recompression units to capture methane emissions arising from pipeline inspection works and compressor station depressurisations.
- Compressor machinery train - Trials of combined gas recompression and zero loss compressor seal technology to reduce methane emissions from the compressor machinery train.
- Detection and analytics - An expansion of its periodic fugitive monitoring programme and an implementation of new continuous fugitive monitoring systems at selected above ground installations.

Each submission comprises of a narrative for the specific theme and is designed to provide a clear explanation and justification for the proposed scope and funding requirement.

The submission is based on our assessment of the regulatory information requirements specified in Ofgem's guidance and governance documents for RIIO-2 re-openers. Each theme submission has common elements which are applicable to all. The common elements are:

- Background: Provides an overview of the long-term aims and objectives for reducing methane emissions that are part of the gas transmission asset base, a summary of developments to date, the specific goals for the works that will be delivered, and an explanation of our internal project structure and governance framework.
- Needs case: Describes the alignment of this funding proposal to National Grid's overall business strategy and commitments, articulates the key problems that the investment is aiming to address, the specific scope of the proposed funding requirement, and justification of planned activities. This chapter also provides detail on the key outcomes and outputs anticipated, the intended project delivery plan, success criteria, and key project risks and mitigations perceived at this stage.
- Regulatory treatment: This chapter confirms the eligibility of this project for funding under the NZASP. It also proposes the specific regulatory treatment that could be adopted under this mechanism, with reference to the stated funding principles. This includes detailing the expected allowed revenue and customer and consumer bill impacts based on funding requirement and regulatory treatment.
- Assurance: Outlines the key assurance activities undertaken on the re-opener submission.
- Supporting information: A listing of additional information products submitted in support of this re-opener application. Examples include spreadsheets describing cost build-up of requested investments, quotes and CBA where applicable - these are referenced where relevant throughout the document.

### 3 Alignment with overall business strategy and commitments

National Grid Group's target is to reach net zero direct greenhouse gas emissions by 2050. NGGT contribution to this target is through:

- The replacement of compressors with more efficient equivalents to comply with emissions legislation.
- A commitment to move towards alternative fuel utilised in operational vehicles.
- The installation of solar panels at our operational sites.
- Ensuring the energy used in our office buildings is from renewable sources.

These commitments, along with NGGT's specific commitment outlined in its RIIO-2 business plan, to reduce methane emissions through targeted investment and repairs that are made possible by increased monitoring, will contribute towards the Group's 2050 net zero ambition.

The focus on methane emissions, such as the recent Global Methane Pledge agreed at COP26, to which the UK is a signatory, has increased the urgency to reduce all greenhouse gases (especially methane) in the context of climate change. Since NGGT submitted its RIIO-2 business plan, the focus on methane emissions has grown significantly and as such NGGT wishes to utilise the NZASP as a mechanism by which it can go further in this area than was detailed in the original business plan.

The methane emission reduction and detection options that NGGT proposes align with the key priorities highlighted by stakeholders and consumers in the development of our RIIO-2 business plan. Namely to "care for the environment and communities" and "facilitate delivery of a sustainable energy system". Additionally, our proposals align with the Environmental Action Plan (EAP) theme "Our Climate Commitment", in which NGGT commits to reducing carbon emissions by 2026, and specifically establishing a baseline for methane emissions gas escapes on the transmission system through improved monitoring during RIIO-2.

In October 2020 the European Commission published its EU strategy to reduce methane emissions, putting forward legislative and non-legislative actions in the energy, agriculture, and waste sectors. The priorities of the strategy were to improve measurement and reporting of methane emissions across all sectors and to reduce methane emissions in the energy sector by introducing obligations to improve detection and repair and prohibit routine flaring and venting practices.

In December 2021, the Commission published its proposal to regulate methane emissions in the energy sector. The proposed regulation mandates improvements in measurement, reporting and verification of energy sector methane emissions and aims for a reduction in methane emissions through mandatory gas escape detection and repair, and a ban on routine venting and flaring. NGGT has had visibility of these regulations as they have been developed and the subsequent consultation process that NGGT contributed to through membership of Marcogaz and Gas Infrastructure Europe.

By undertaking these investments, NGGT will further reduce the impact on the environment from our operations, while also ensuring that a low emission sustainable NTS is operated in the future. This will deliver on our RIIO-2 commitment to focus on reducing all methane emissions through monitoring gas escapes on our network and working on ways to reduce them.

The investments NGGT proposes to make at this time, to reduce methane emissions and improve detection of fugitive methane emissions, will directly support the evidence base required for robust investment proposals during development of its RIIO-3 price control business plan. A proportional risk-based approach has been followed in the development of our proposals and builds on previous innovation projects where applicable, e.g. Network Innovation Allowance (NIA) and Strategic Innovation Fund (SIF).

These investments also align with the principles of the methane regulations being proposed in the EU, which are expected to be ratified in the European Parliament by the end of 2022. The extent to which these regulations are applied in UK legislation is currently uncertain however the recent Climate Change Committee report<sup>1</sup> to the UK government on progress in reducing emissions signalled the need for meaningful policy action to underpin emission reduction commitments. At the time of this submission NGGT is setting itself up for future compliance by investing in fugitive gas escape detection capability and assets to reduce and minimise venting. These reductions contribute to the UK's Global Methane Pledge commitments.

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<sup>1</sup> Climate Change Committee "2022 Progress Report to Parliament" <https://www.theccc.org.uk/publication/2022-progress-report-to-parliament/>

## 4 Central case

### a. Needs case / problem statement

To deliver our net zero commitments and methane emission reduction ambitions, NGGT must first address two key areas; better methane emission baselines, which will facilitate targeted future investments to drive down methane emissions, and the expedited implementation of technology to reduce known methane emission sources.

NGGT, as the sole UK gas transmission system network operator and owner, recognises it has an important role to play in limiting methane emissions and supporting the UK's commitments, including as a signatory to the Global Methane Pledge. Given the urgency involved, NGGT proposes to combat NTS methane emissions with impactful investments that target known methane emissions occurring from maintenance activity, as well as fast-tracking innovative approaches to address compressor vented emissions.

In addition, NGGT wishes to invest in both periodic and continuous monitoring capability to improve fugitive methane emission data availability, which will in turn facilitate targeted and efficient methane emission reduction investment in future price controls. These investments address the immediate need to reduce methane emissions where there are readily available emission reduction options, and facilitates an accelerated reduction in RIIO-3, pending successful trials of options transitioned out of innovation. Our proposals build on RIIO-1 licence conditions and Network Innovation Allowance funded projects, namely the Greenhouse Gas Investigative Mechanism (GHGIM) and Monitoring of Realtime Fugitive Emissions (MoRFE) and Methane Reduction from Gas Equipment (CH4RGE) NIA projects.

To enable the options assessment to reduce methane emissions, NGGT has undertaken an analysis of its sources of NTS methane emissions, and in doing so has established its 2021 methane emission performance. The methane emissions presented are based on direct measurement or robust engineering calculation. Use of emission factors was not included as transmission network emission factors are of high uncertainty and can both over and under estimate emissions.

This analysis has allowed NGGT to identify where the potential reduction quick wins are and where it is possible to eliminate methane emissions from operating the NTS, as well as where there are gaps in our understanding of methane emission sources. NGGT has also identified where improved detection and quantification is needed to obtain a more complete picture of fugitive methane emission performance across the NTS. The current view of fugitives as an emission source is limited to data obtained from our compressor and terminal survey programme. Figure 1 summarises this analysis.

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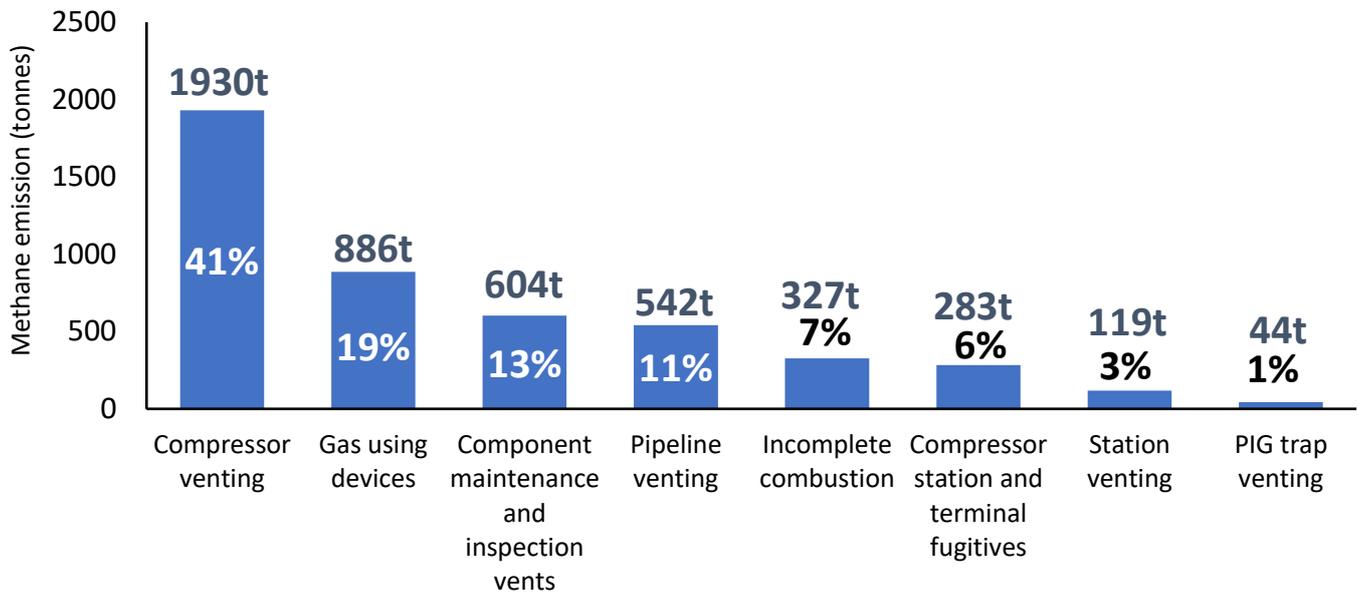


Figure 1 - NGGT 2021 calendar year methane emission sources and performance.

NGGTs 2021 methane emission performance was 4.735 kt of methane or 118.38 ktCO<sub>2</sub>e. To monetise this performance, for the purposes of evaluating the indicative cost benefit of NGGTs investment proposals, NGGT has taken the central 2022 carbon value in the ‘Department for Business, Energy & Industrial Strategy - Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal’ of £248 per tonnes of CO<sub>2</sub>e and a global warming potential (GWP) of methane of 25 over a 100-year horizon. The monetised value of NGGTs methane emissions performance is therefore £29.36m, split across the sources outlined in figure 2 below.

The current high global gas prices mean that consideration should be given to the wholesale value of the methane emissions emitted. In Figure 3 this is illustrated for 2021 methane emission performance. NGGT has considered the wholesale value of the gas emitted in its cost benefit analysis (CBA) for mobile recompression and compressor machinery train methane emission reduction. This methodology is used to monetise the emissions associated with vented and fugitive emissions and is the same as the methodology that NGGT used in the fulfilment of Special Condition 8J of the Gas Transporters Licence, the Greenhouse Gas Investigative Mechanism. It should be noted that the current volatility in global gas markets means the Department for Business, Energy & Industrial Strategy (BEIS) reference case value in Figure 3, used to monetise the wholesale value of the gas in each emission category, does not represent current gas wholesale value. Should today’s prices be used, then the monetised benefit of the investments proposed will be significantly higher.

The methane emission estimates in Figure 1 are based on engineering calculations and equipment specifications for gas emitting equipment for all sources, except for compressor station and terminal fugitives, and incomplete combustion. In formulating the methane emission estimate in Figure 1, NGGT has followed the Marcogaz document “Assessment of methane emissions for Gas Transmission and Distribution system operators”<sup>2</sup>. Compressor station and terminal fugitives are based on measured methane emission performance from a four-yearly periodic survey and data for incomplete combustion from gas turbine exhaust gas measurements unburnt hydrocarbons. NGGT currently undertakes no fugitive survey for detection and quantification of fugitive methane emissions, outside of compressor stations and terminals.

<sup>2</sup> Marcogaz guidance document WG\_ME-485 “Assessment of methane emissions for Gas Transmission & Distribution System Operators” <https://www.marcogaz.org/publications/assessment-of-methane-emissions-for-gas-transmission-distribution-system-operators/>

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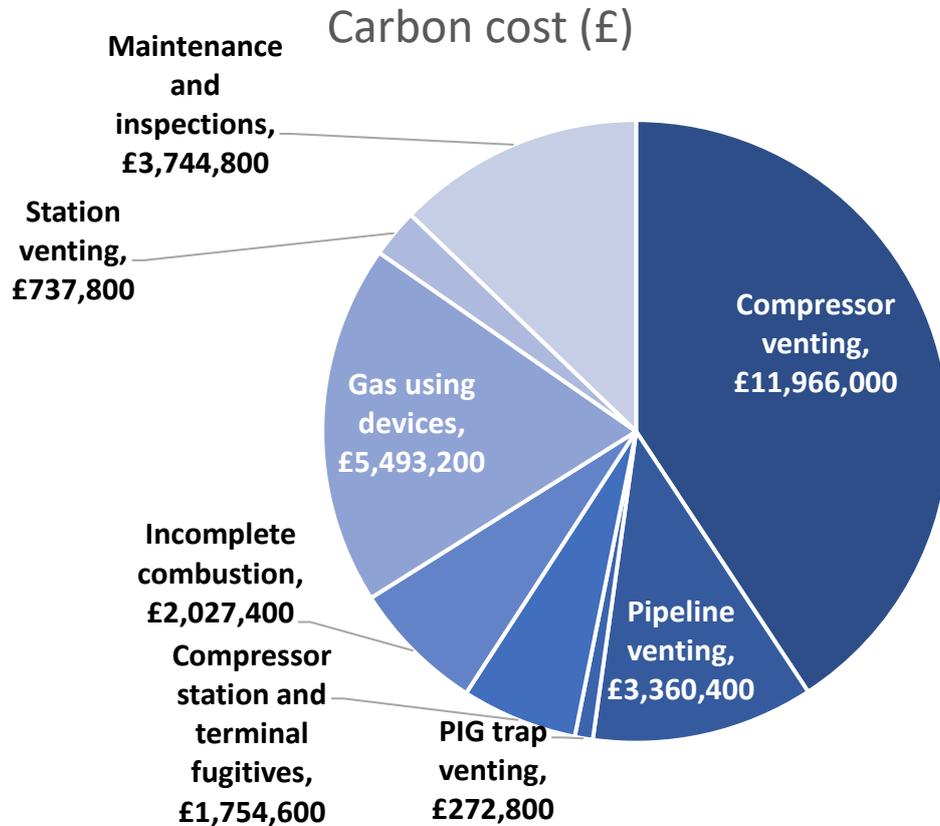


Figure 2 - Monetised value of NGGTs 2021 methane emission performance at 'Department for Business, Energy & Industrial Strategy - Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal' 2022 central case carbon value and methane GWP of 25.

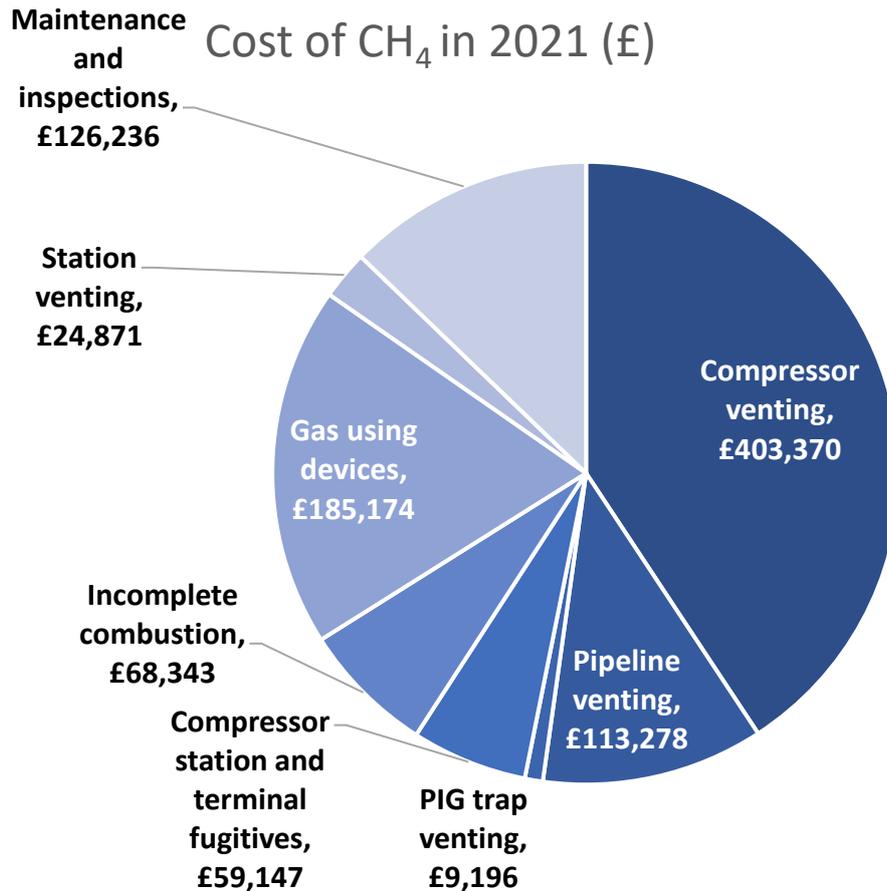


Figure 3 - Monetised value of NGGTs 2021 methane emission performance as to reflect the wholesale price of gas. This uses the BEIS reference case value for natural gas, where of a typical asset lifespan across a 20 year average the price is equivalent to £209/tonne of natural gas. Note - should current gas price be used wholesale value of gas in each category would be significantly higher.

NGGT proposes to, subject to funding award, implement technology now - where it is readily available - and fast track technology that is currently under trial, to reduce methane emissions. Where there is reduced visibility of fugitive methane emissions, it is proposed that an expanded fugitive gas escape detection programme should be implemented. This moderate application provides a balanced approach for consumers' money, investing in proven technologies to detect and reduce emissions represents <1% of RIIO-2 Business Plan allowances, whilst delivering on a significant stakeholder concern. Although challenging to quantify in absolute monetary terms, stakeholder engagement around methane emissions has been consistent, i.e. reduce emissions quickly and efficiently to meet net zero commitments.

## b. Options and selection methodology

Our investment proposals are to implement enhanced capability mobile natural gas recompression technology to reduce emissions from pipeline maintenance and inspection works, and whole compressor station and terminal depressurisations. Implementing enhanced fugitive natural gas escape detection and quantification will improve the visibility of fugitive methane emissions and develop a measurement-based methane emission performance baseline during the remaining RIIO-2 period. An acceleration of trials of methane emission reduction technology for the compressor machinery train will support the wider rollout and implementation of the technology during the RIIO-3 price control. Trials of methane emission reduction technology in RIIO-2 will facilitate a robust business case for wider roll-out in RIIO-3.

By undertaking these investments, NGGT forecast we can reduce total methane emissions attributed to pipeline, station, and pipeline inspection gauge (PIG) trap venting by up to 15%. In addition, NGGT begins

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the process of addressing compressor venting, which is the largest source of methane emissions generated from operating the NTS, and sets the foundation for further reductions in the RIIO-3 period.

In considering the options available, NGGT has looked at the technical readiness of the solutions proposed and taken account of the urgency to reduce greenhouse gas emissions and limit global warming to 1.5 degrees. NGGT has undertaken an 'art of the possible' options assessment for methane emission reduction and improved emission detection. An initial market scan has been undertaken and NGGT has therefore proposed solutions that can be implemented now to reduce methane emissions and provide improved methane emission detection and quantification.

The methane emissions that NGGT wishes to address would not be addressed by market-based options, due to the inherent nature of the investment. NGGT considers a market-based option in this context to be a financial instrument or mechanism such as the UK Emission Trading Scheme (UK ETS), which would incentivise methane emission reduction, or a commercial arrangement that NGGT could introduce, to drive methane emission reduction. There is no such market-based option available that NGGT considers it could use or introduce, hence no market-based option has been considered.

The option to delay investment and wait for more mature methane emission reduction solutions to come to market, particularly to address compressor venting, could be considered. However, given the urgent need to reduce greenhouse gas emissions in the context of the climate emergency, NGGT does not consider this a viable option. Additionally, the Global Methane Pledge requires action now to enable the methane emission reductions committed to by 2030 to be realised. Therefore, along with improved detection and quantification of gas escapes, investments that provide methane emission reduction now and/or expedite the implementation of emission reduction options are considered the right thing to do.

Investment in the preferred options will allow NGGT to implement measures quickly to reduce known emissions where there are commercially available solutions for reduction. Carrying out accelerated trials of engineering options will also set NGGT up to roll-out these options more widely on the NTS in RIIO-3 and this will address the largest contributor to our methane emission performance, i.e. compressor venting. Finally, it will improve detection and quantification of fugitive methane emissions across the entire NTS to support robust decision making and emission reduction through asset health investment in RIIO-3.

The options that NGGT has considered in its selection of the preferred approach are described in the options section of each investment proposal.

### c. CBA

For the mobile recompression and compressor machinery train themes a CBA approach, based on the methane emissions saving from implementing these emission reduction solutions, has been followed using Ofgem-provided templates. The wholesale value of the gas saved for these interventions has also been included within the CBA. However, at current gas prices, the value would be up to ten times higher than that presented, as the BEIS reference case value has been used - not current gas wholesale price.

For detection and analytics, this approach could not be followed as the purpose of the investment is to establish a baseline level of fugitive methane emission performance across NGGTs above ground asset base. Although Opex repairs will be undertaken to address gas escapes identified from enhanced monitoring, understanding the level of fugitive emissions that could be found is highly uncertain and, as a result, a CBA approach based on emission reduction could not be completed.

For detection and analytics, the benefit of undertaking the investment has been justified based on calculating the carbon value of the fugitive emissions that NGGT releases and monetising these releases following guidance within the 'Department for Business, Energy & Industrial Strategy - Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal'. The same emission monetisation methodology has been followed for all three themes of this submission paper.

Costs associated with delivery of each investment theme have been built up from supplier quotes where procurement of equipment is needed, and Opex for the delivery and impact from each of the three investment

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themes have been included. A tender process for the equipment costs will follow, post-award and where requested, to ensure cost efficiency and value for money for consumers.

Within the theme submissions, all prices are stated in 2018/19 prices. The following factors have been used in the CBA for the mobile recompression and compressor machinery train methane reduction themes and are reflected in the CBA templates.

*Table 1 - Factors used in CBA analysis.*

Factor	Values
2022/23 to 2018/19 conversion <sup>3</sup>	1.17
Global Warming Potential of methane over 100-year horizon <sup>4</sup>	25
2022 Carbon values in £2020 prices per tonne of CO2 – Low Series <sup>5</sup>	£124
2022 Carbon values in £2020 prices per tonne of CO2 – Central Series <sup>4</sup>	£248
2022 Carbon values in £2020 prices per tonne of CO2 – High Series <sup>4</sup>	£373
USD to GBP: \$1 <sup>6</sup>	0.86
EUR to GBP: €1 <sup>5</sup>	0.87

Where a contingency has been included in NGGTs cost estimations, evidence for this has been provided following the Infrastructure and Projects Authority Cost Estimating Guidance in the form of a Quantitative Risk Assessment (QRA). For narrative on the CBA undertaken and any cost contingency included for each investment theme, please see the cost section of the theme submission.

Once project approval to proceed is received, and third-party contracts are signed, NGGT will aim to place currency hedge(s) for any non-GBP denominated costs in line with our internal Treasury department guidelines. This will help minimise the impact of currency fluctuations over the course of the project, and indirectly provide additional certainty on non-GBP based costs for the consumer.

Where NGGT has used quotes from non-GBP suppliers, the spot exchange rate in Table 1 has been used for conversion. In addition, 2018/19 price base conversion, carbon valuation and methane global warming potential factors used in cost build up and CBAs, where applicable for each investment theme, can also be found in Table 1. Latest quotes, exchange rates and price base conversion factors will be used in a cost validation immediately prior to award, to protect consumer against changes in these economic variables between submission and award.

Further to the CBA, it must also be noted that NGGT are applying for funding to continue and enhance our drive towards Net Zero, in line with the UK commitments under the Global Methane Pledge, Government strategy and NGG strategy. Our goal is not short-term commercial payback, but rather one of methane

<sup>3</sup> Ofgem RIIO-2 18/19 price base conversion. As at 9th September 2022.

<sup>4</sup> Department for Business, Energy and Industrial Strategy Guidance “Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal”.  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1024054/1.Valuation\\_of\\_energy\\_use\\_and\\_greenhouse\\_gas\\_emissions\\_for\\_appraisal\\_CLEAN.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1024054/1.Valuation_of_energy_use_and_greenhouse_gas_emissions_for_appraisal_CLEAN.pdf)

<sup>5</sup> Department for Business, Energy and Industrial Strategy Policy paper “Valuation of greenhouse gas emissions: for policy appraisal and evaluation”. <https://www.gov.uk/government/publications/valuing-greenhouse-gas-emissions-in-policy-appraisal/valuation-of-greenhouse-gas-emissions-for-policy-appraisal-and-evaluation>

<sup>6</sup> Google.co.uk currency exchange rate as at 9th September 2022

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reduction and long-term environmental gain. Our investment proposals take us towards this ambition, albeit with extended payback periods in some cases given that NGGT are pursuing innovative and untested solutions to drive down methane emissions.

### d. Delivery plan

A delivery plan for each theme is included within the theme submission document. The included delivery plans assume award decision in February 2023.

For mobile recompression and detection and analytics options, the timeline for implementation is predominantly driven by the procurement and commissioning activities to purchase 'off the shelf' mobile natural gas recompression and methane emission detection and quantification equipment. The compressor machinery train options for compressor recompression and zero loss seal trials have a longer implementation timeline, as there is a period of front-end engineering design (FEED) and asset construction and commissioning to be undertaken.

For all solutions, NGGT has made initial contact with viable suppliers. The required procurement, construction, and FEED activities to support delivery has not started, but the planning to allocate resource to support these activities has begun. At the point of operating the methane reduction solutions post-commissioning, NGGT believes that pipeline, compressor recompression and zero loss seal solutions can be operated within existing operating capacity and headcount. However, Opex for additional headcount to facilitate construction activity has been included. For the PIG trap and compressor station recompression units, and periodic and continuous monitoring, additional headcount will be needed as this is new or expanded capability for NGGT.

To implement the enhanced periodic and continuous monitoring programme covering the whole of the above ground gas transmission system asset base, additional headcount has been included to undertake Opex repairs of identified gas escapes and to monitor gas escapes that cannot be repaired without Capex investment in RIIO-3.

In the development of this proposal, NGGT has undertaken a deliverability assessment for each investment theme. This has considered in-house delivery, outsourcing and, where appropriate, NGGT has requested additional Opex to either ensure it can deliver on the investment themes or manage the impact of their delivery.

## 5 Interaction with existing regulatory mechanisms

An ex-ante allowance is proposed for this re-opener under the relevant uncertainty mechanism. The purpose of this reopener is to make progress on the UK's environmental pledges made at COP26 and not to adhere to traditional network incentivisation. During our RIIO-3 evaluations and business proposals, enhanced detection and trials of compressor machinery train recompression units and zero loss seals will be considered and reviewed for the most appropriate funding mechanisms, which may or may not be similar to this proposal.

### **Greenhouse Gas Emissions Incentive**

Our proposal to trial new technology on up to four compressors through the Net Zero Projects Re-opener would have a negligible impact on the current GHG emissions incentive, using incentive performance year 2021/22 as a benchmark, the total amount of methane emissions identified for reduction on the four compressors accounts for 6.7% of total methane emissions (zero loss compressor seals 2.4% and recompression 4.3%), or 4.8% of the target allowance only impacting the final year of RIIO-2 and therefore NGGT believe that this wouldn't necessitate an amendment to the RIIO-2 licence arrangements.

The successful demonstration of the processes and technology under this reopener would then need to be considered as part of any RIIO-3 GHG emissions incentive.

### **NTS Shrinkage**

At this trial phase, the impacts will be negligible on Unaccounted for Gas (UAG), which is a component of NTS Shrinkage. Therefore, we do not believe this would significantly impact the energy procurement reputational incentive for NTS Shrinkage for RIIO-2. This is because the total amount of methane emissions identified only accounts for approximately 4% of UAG, and NGGT will be tackling less than 10% of total methane emissions, by the final year of RIIO-2, through this funding application, hence we estimate the potential avoided lost gas as 0.4% of the UAG total. Successful trial demonstration could then be factored into the next RIIO price control period.

NGGT recognise that Shrinkage and GHG incentives will need to be reassessed for RIIO-3.

## 6 Stakeholder Engagement

NGGT has undertaken stakeholder engagement sessions to test and refine its proposed investments, and balanced and objective information has been provided to assist stakeholders in understanding the problem, alternatives, opportunities, and solutions. These sessions have allowed us to understand our stakeholder and consumer level of ambition for methane abatement, and to receive feedback on our proposals. Sessions have been held with the Independent User Group, the environmental regulators of England, Wales and Scotland, the gas distribution networks (GDNs), Clean Air Task Force, Citizens Advice, Environmental Defence Fund, Greenpeace and an open webinar for gas shippers, customers, and other interested parties.

At the stakeholder sessions, the same two questions were asked, and NGGT received 44 responses. Below is a summary of the responses received.

Question 1: Are our proposals to spend in the range of £26m and £36m (2021/22 pricing, correct at the time of engagement) to save up to £15m per annum in carbon equivalent?

Response: 82% of responses to this question indicated that the investment was 'about right'. 13% indicated that the investment is 'not ambitious enough' and 5% believe that the investment is 'too ambitious'.

Question 2: Do you support our proposal of implementing methane monitoring and detection for the network as a whole?

Response: 100% of responses to this question indicated that stakeholders support this proposal.

Other free text feedback suggested that zero loss seals should be included along with compressor machinery train recompression. Zero loss seals are identified as one of the preferred options to address vented emissions. In addition, concerns over future-proofing have been noted, with questions over our proposals being valid for methane/hydrogen blends. NGGT has taken this feedback onboard as it develops its proposals further. Stakeholders strongly support the need for expanded fugitive emission monitoring on the network, to move away from estimation, understand the actual state of play, allow targeted responses, and, consequently, to drive future investment.

Overall, the application for funding to monitor and reduce methane emissions on the NTS is broadly in line with stakeholder expectations.

Further engagement is proposed post-submission and post-award to maintain relationships with stakeholders who have expressed a strong level of ambition for methane abatement and reduction. A playback submission to all stakeholders will be provided, with 1-2-1 sessions offered to those stakeholders we have previously engaged with. Partnering with stakeholders, at frequent points in the process, will allow us to provide them with feedback on how our decisions have been influenced by their views, and to seek further feedback on our actions going forward.

## 7 Assurance

As a part of our assurance requirements under Ofgem’s Re-opener Guidance, NGGT will provide confirmation from our Regulation Director, who is accountable for the RIIO-2 regulatory allowances, that the three assurance points requested by Ofgem (in italics) have been met in our final submission. These three points and activities that have been undertaken include:

*“It is accurate and robust, and that the proposed outcomes of the re-opener are financeable and represent good value for consumers”?*

- The application submitted has been prepared by a multi-disciplinary team involving leaders from NGGT UK Regulation, Gas Transmission and System Operations. Iterative internal challenge and review between these teams supports the accuracy and robustness of the proposals.
- The relevant senior leaders will confirm support for the re-opener proposals in terms of needs case, consumer benefits, deliverability inside RIIO-2 years three to five, and alignment with wider business strategy.
- Value to consumers is demonstrated through investment to develop a network to align with Government net zero targets.

*“There were quality assurance processes in place to ensure the licensee has provided high-quality information to enable Ofgem to make decisions which are in the interests of consumers”.*

- The information in the submission and supporting files has been subject to both peer review and approval by a manager more senior than the author.
- Calculations of proposed allowances presented in the re-opener submissions have been assured by the relevant Finance Business Partners with an independent lens.
- The applications have been subject to robust assurance and are accompanied by supporting information, which includes the relevant Data Assurance Guidance (DAG) Submission Assurance Reports.
- The application includes a Table that maps out which sections of the application relate to individual requirements as set out in the relevant re-opener licence condition and NZASP guidance, which is attached as an Appendix.
- Draft contents of the applications have been shared in advance with Ofgem through bi-lateral discussions over the course of our post-trigger phase. NGGT has taken on-board Ofgem’s feedback from those sessions, leading us to understand that our applications provide a proportionate amount of evidence, having regard to the values of allowances and complexity involved.

*“The application has been subject to internal governance arrangements and received sign-off at an appropriate level within the licensee”*

- The submission has been subject to internal governance through monthly meetings chaired by the President of NGGT. Final submission approval was given by the Uncertainty Mechanism Oversight Committee chaired by the Head of Investment and Process as a delegated forum of the President of NGGT.

## 8 Glossary of terms

Acronym / term	Definition
BAT	Best Available Technique
CAPEX	Capital expenditure
CBA	CBA
COP26	Conference of the Parties conference
DAG	Data Assurance Guidance
FEED	Front end engineering design
Fugitive emissions	Gas escapes and other irregular releases of gases from a pressurized containment
GHGIM	Greenhouse Gas Investigative Mechanism
Global Methane Pledge	Pledge to take voluntary actions to contribute to reducing global methane emissions by at least 30 percent from 2020 levels by 2030
GWP	Global Warming Potential. Developed to allow comparisons of the global warming impacts of different gases
Net zero	A target of completely negating the amount of greenhouse gases produced by human activity, where there is a balance achieved between the carbon emitted into the atmosphere and the carbon removed
NGGT	National Grid Gas Transmission. Sole UK gas transmission system network operator
NIA	Network Innovation Allowance
OEM	Original equipment manufacturer
OPEX	Operating expenditure
PIG	Pipeline inspection gauge
RIIO	Revenue = Incentives + Innovation + Outputs. This is the regulatory framework through which funding is set for the business. RIIO-2- covers the period from April 2021 to March 2026
QRA	Quantitative Risk Assessment
TSO	Transmission system operator
UAG	Unaccounted for Gas
UM	Uncertainty mechanism