

ENA Gas Environment Group

Combined Climate Change
Adaptation Reporting

Joint Second Round Response

2015



SGN

Your gas. Our network.

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1 Introduction

This response is submitted on behalf of the gas transmission and distribution network operators for Great Britain. This group comprises of:

- National Grid
- Northern Gas Networks
- Scotia Gas Networks
- Wales & West Utilities

These companies are all members of the Energy Networks Association (ENA), the industry body for the UK gas and electricity network companies. ENA facilitates the sharing of best practice and helps provide a coordinated approach to the climate change adaptation response by these companies, where that response is considered common to all network operators in Great Britain.

The representatives of the ENA Gas Environment Group have worked collaboratively to develop a comprehensive united industry response to the questions posed by the Climate Change Adaptation Reporting Power, Guidance for Repeat Reporters. The report reflects the common issues faced by the businesses in addressing the risks of climate change. Additional network specific information, where applicable, is included in italics within the body of the report.

The companies control and maintain the critical national infrastructure that delivers vital services into homes and businesses throughout the UK. Gas is transported through Gas Transmission networks to regional Gas Distribution networks that then deliver energy to customers on behalf of suppliers. Business operations include connecting new consumers, maintaining and replacing pipe work and associated assets, and dealing with gas emergencies along pipelines and within domestic, commercial and industrial properties.

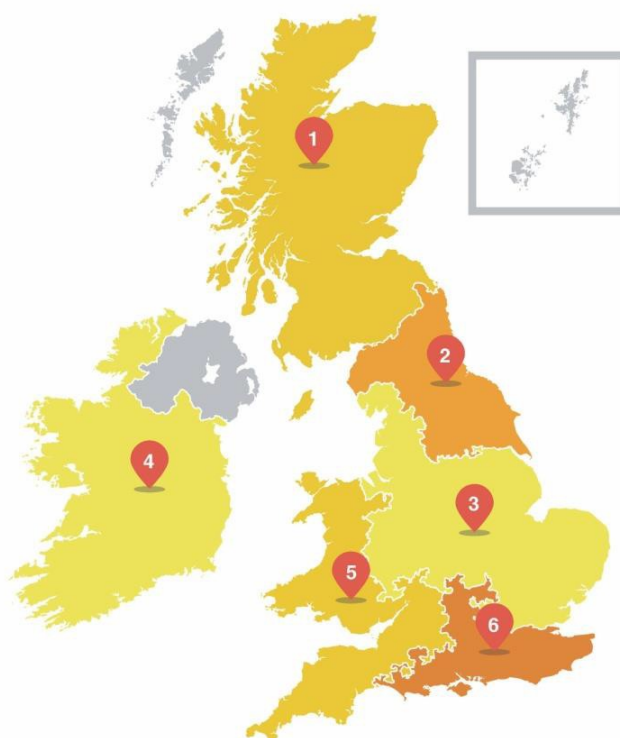
National Grid is the owner and operator of the national gas transmission system and four of the eight regional Gas Distribution networks in Great Britain. The other Gas Distribution Network Operators (GDNs) are Southern Gas Networks (SGN), Scotland Gas Networks (SGN), Wales & West Utilities (WWU) and Northern Gas Networks (NGN).

The primary duties of the companies are covered under the requirements of the Gas Act 1986 and Electricity Act 1989 to develop and maintain efficient, reliable, safe and secure networks and to facilitate competition. Further duties are included within secondary legislation Regulations.

All GDNs operate regulated monopoly businesses operating under licences issued by Ofgem. Allowed revenues for the industry are currently set by Ofgem every eight years under the RIIO (Revenue = Incentives + Innovation + Outputs) Price Control Review framework and these reviews govern the costs and income associated with operating regulated activities.

2 UK Gas Distribution Network Operators

Gas Distribution



3 Individual Companies

National Grid Gas (NGG) plc owns and operates the UK Gas Transmission system and the low pressure Gas Distribution in the heart of England distributing to approximately eleven million homes, office and schools via 7,700km of gas pipelines. NGG connects producers, processors, storage, transmission and distribution network operators as well as suppliers to industrial, commercial and domestic users.

SGN is a privately owned Gas Distribution company, operating over 74,000km of gas mains and services in the south and South East regions of England and the whole of Scotland under the banner of SGN. It is the UK's second largest Gas Distribution network company and is responsible for delivering gas to its 5.8 million customers safely, reliably and efficiently.

Wales & West Utilities (WWU) was launched as an independent Gas Distribution business in June 2005 following the sale of the gas network for Wales and the South West of England. With more than 35,000km of mains, WWU transports gas to the homes and businesses of 2.5 million consumers across a geography covering 1/6th of the UK and serving a population of 7.4 million people.

Northern Gas Networks (NGN) is responsible for delivering gas to 2.7 million homes and businesses across northern England. The Company was formed when The North of England Gas Distribution network was acquired from National Grid plc in June 2005. NGN's network consists of 37,000km of gas pipes and associated delivery and storage apparatus. NGN's area covers northern Cumbria, the North East and North, East and West Yorkshire with a population of more than 6 million people.

4 Gas Distribution

Gas is delivered from the beach terminal through the high pressure National Transmission System (NTS), owned and operated by National Grid, to the GDNs. Gas is delivered into the Local Transmission System (LTS) of each network via offtakes from the NTS. Gas under high pressure in the LTS is moved around the distribution networks and subsequently reduced to Intermediate Pressure (IP), Medium Pressure (MP) or Low

Pressure (LP) via Pressure Reducing Installations. Gas is then delivered to commercial and domestic customers via a network of polyethylene (PE) and metallic LP mains and services.

Each GDN's distribution network is comprised of pipelines operating at different pressure tiers. High Pressure (HP) pipelines operate between 70 and 7 Bar, Intermediate Pressure (IP) between 7 and 2 Bar, Medium Pressure (MP) between 2 Bar and 75 mbar and Low Pressure (LP) below 75 mbar. In addition, each company owns and operates storage infrastructure such as High Pressure vessels and Liquefied Petroleum gasholders.

5 Adaptation – First Round Reports

The Climate Change Act 2008 provides the framework for ensuring the UK's ability to adapt to climate change. Defra established an Adapting to Climate Change Programme and in November 2009 laid a strategy before Parliament for using the Adaptation Reporting Power under the Act. Responses were subsequently submitted by the companies to the First Round of Adaptation Reporting in 2010, which was designed to:

- Assess the current and predicted impact of climate change in relation to the companies' functions; and
- Outline the proposals and policies for adapting to climate change in the exercise of those functions and the timescales for introducing those proposals and policies.

The Reports therefore represented individual company assessments of existing assets and business processes and identified areas where the environment is capable of impacting the ability to meet its business objective.

This formed part of the process of ensuring the businesses adapt to the expected climate changes including hotter and drier summers, warmer and wetter winters, coastal, river bed and bank erosion and increasingly extreme weather events such as flooding. The main categories of weather events and environmental risks were identified as follows:

- Flooding and heavy rain fall (including saturated ground conditions);
- Snow and ice;
- Increases in temperature, heat waves and drought conditions;
- Coastal erosion from sea level rise;
- River erosion; and
- Storm events and high winds.

Using information drawn from UKCP09 and working alongside the Meteorological Office Hadley Research Centre, the Environment Agency and the Scottish Environmental Protection Agency, the key risks and opportunities facing the businesses were identified. High emissions projections to 2050 and 2080 were used to determine worst case scenarios and for correlation against the lifetimes of existing assets. Account was taken of the expected increase in number, frequency and intensity of weather events.

The risk methodology and categorisation identified a number of potentially vulnerable areas and the mitigation measures that were either in place or needed to be developed further. Decisions on the appropriate controls are dependent on the accuracy of the supporting information and data and whether a quantitative or qualitative assessment has been made.

The Reports highlighted that network assets and processes may be vulnerable to certain aspects of climate change. However, the national and regional infrastructure has a significant degree of resilience to these impacts and none of the identified risks were considered to be high. The management of these risks is now embedded within companies' overall risk management processes to ensure that any appropriate actions are recorded and completed. Responsibility and ownership of these action plans ensures their timely delivery and climate change adaptation is also subject to the same level of ongoing review and evaluation as other business risks.

Revenue is determined by Ofgem price control mechanisms (currently RIIO-GD1 – Revenue = Incentives + Innovation + Outputs) and dictate the expenditure by the businesses, including the level of adaptation investment. Any increase in adaptation related costs will be required over longer medium to long term timescales however.

The inherent resilience of the networks is largely due to the majority of Gas Distribution assets being located underground, with greater resilience built into the Gas Transmission network compared to the distribution network. Those assets most at risk to the weather and climate parameters, highlighted above, are those found above ground; typically large Pressure Reducing Installations (PRIs), critical sites such as data centres, and pipelines in close proximity to watercourses. Impacts are usually localised to the asset and the process it supports and are unlikely to lead to a loss of supply or result in a risk to the system as a whole.

In addition prolonged periods of extreme weather could have a significant impact on the ability of the workforce to access and carry out their roles, particularly field-based engineers. They could also impact on the ability to conduct 'business as usual' activities as a result of the reliance on appropriate adaptation of other major infrastructures, such as telecommunications and transport. Impacts on the operation of supply chain businesses and the continued availability of equipment also needs to be considered. The environmental impact of companies' assets could be affected by the mobilisation and migration of land contaminants from flooding and ground saturation.

These interdependencies can be mitigated through the implementation of maintenance and inspection regimes, the development of flood defence measures, the availability of necessary equipment, up to date contingency measures and ensuring Business Continuity Management Plans are in place.

6 Understanding Climate Risk

How has your understanding of climate risks, impacts and their effects on your sector/organisation and stakeholders advanced since your first round report?

There has been no significant change in the understanding of climate change risks since the first round of Adaptation Reports were submitted in 2010/11. This understanding was based on the UKCP09 data published under the Climate Impacts Programme (UKCIP) that forecast the risks under various scenarios to the end of this century.

Similarly Environment Agency flood maps that were available and referenced at the time have not been developed any further and so the perceived risk remains the same. However, all the gas networks operators (GDNs) have experienced severe weather events in last few years which have provided ongoing learning and further insight into, and confidence in, the resilience of the gas networks infrastructure.

Actual flooding events occurring within the years subsequent to the original report have also demonstrated the network's ability to withstand incidents of this nature without impacting on security of supply.

What climate change evidence or research have you used to better understand the implications for organisational functions?

The Companies are still reliant on UKCP09 as the primary source of information and data and which remains the only such reference available. Updates from the Climate Ready service or other updated research data would therefore be welcomed.

Wales & West Utilities has shared information regarding the development of a pilot project with Landmark Information Group to map the physical impacts of climate change.

Has your understanding of thresholds of climate impacts advanced to better pinpoint organisational vulnerability? If so, how?

UKCP09 provides climate information for the UK up to the end of the century. The projections show three different scenarios representing high, medium and low greenhouse gas levels. Information is provided on observed climate data, future climate projections and future marine and coastal projections. These scenarios are still being used and remain the best existing available information.

How have you developed your quantified assessment and analysis of risk likelihood and impacts?

The original round of Adaptation reporting provided Gas Distribution with increased confidence in the level of resilience in our asset infrastructure and this allowed the companies to focus on remaining areas of risk. The

existing risk assessments have been reviewed and confirmed as being still fit for purpose and the current risk ratings remain the same based on the available data.

7 Understanding Uncertainties

What uncertainties remain in monitoring and evaluating climate risks to your sector's/organisation's functions?

There is a need for cross sector planning scenarios to ensure that sectors with interdependencies have used similar assumptions when reporting; this was not fulfilled in the first round of reporting. This is important to address the wide variety of views regarding the extent and impact of climate change on national infrastructure.

The overall level of uncertainty for gas networks is low as the sector has a high level of inherent resilience due to the level of safety awareness and regulatory overview.

Monitoring, evaluating and adapting to risks of all types, including climate change, are an integral part of business as usual.

What new uncertainties have come to light?

No new uncertainties in Gas Distribution have emerged since the original Adaptation report. The businesses continue to monitor three key areas of flooding, ground subsidence and coastal and river erosion.

Further information on flooding risks is available from both internal and external sources. However, this is limited. Further analysis is still required to understand the impact associated with subsidence/land slips and the extent to which climate change will cause ground movement. Asset replacement programmes continue to reduce this risk by removing brittle metallic mains from the network however. River and coastal erosion continue to be monitored at identified locations and investment strategies are introduced where required.

What further implications do uncertainties have on action your sector/organisation has taken or plans to take?

Any emerging uncertainties will be captured within the risk management approach adopted by the companies and addressed within business work plans.

This process needs to ensure that any asset investment made is necessary, timely and appropriate. All of the companies are regulated monopoly businesses and as such capital and operating expenditure is subject to economic regulation by Ofgem. This is achieved via a periodic price control process known as RIIO (Revenue = Incentives + Innovation + Outputs). The current price control runs from 2013 to 2021 and, unless there are exceptional or unforeseen circumstances, then the levels of approved revenue needed to accommodate the planned asset infrastructure investment and maintenance for this period, including any work required to adapt to climate change, have now been determined.

At present the current UKCP09 data does not support further asset investment beyond that already planned. The existing revenues will allow for some reactive investment but the available forecast projection data does not adequately support significant adaptation investment at this time. However, the Landmark pilot project indicates the potential to generate meaningful asset impact data. This could be used to support further infrastructure investment across multiple industries such as utilities, transport, telecommunications, insurance bodies and construction.

Climate change risk will continue to be monitored as part of the companies' approach to risk management and information will be shared with the sector via ENA.

What progress have you made to address information gaps?

Along with other sectors the gas network industry remains reliant on national climate change data, projection scenarios and research published by the Government. Consequently these need to be periodically revised and updated. Access to a tool, such as the Landmark climate change physical impact mapping, would be of great benefit in justifying and delivering robust adaptation measures across the whole of the UK.

In the meantime the ongoing monitoring of network operations, particularly in periods of severe weather, together with sharing of experience across the sector via the ENA, has improved the confidence levels in the resilience of the networks to future climate change impacts. This in turn provides an indication of any appropriate mitigating actions that may be required.

What are the strategic business and methodological assumptions that underpin your analysis of impacts and risks?

Company business strategies are driven by both asset life cycles and the regulatory framework within which the sector operates.

Assets are installed with an expectation of over 40 years of reliable service based on equipment integrity, level of operational use and suitable maintenance regimes. Based on these parameters, and the standards to which such equipment is initially designed, constructed and installed, assets are deemed to be climate resilient during this service lifetime.

The levels of asset investment that are determined in the intervening price control periods assist in the assessment and response to the impact of climate change adaptation. The assumptions that are made as part of this process remain based on the available long term climate data forecasts.

8 Addressing Barriers and Understanding Interdependencies

Where you've identified interdependencies, how have these assisted or hindered actions to address climate risk?

The First Round Reports highlighted key interdependencies with other sectors that were not previously required to report via the mandatory process or did not provide a comprehensive level of reporting. Details of fundamental interdependencies with transport, telecommunications and the local authority sectors in particular have resulted in some areas which retain higher risk profiles than necessary and which would have benefited from being designated as Reporting Authorities from the outset.

Within the gas sector, high levels of cooperation exist between all the network operators to manage emergency situations including major incident simulations. This, together with joint working via the ENA, helps to create an environment of cooperation to address climate risk.

What were the main barriers to implementing adaptation actions and why?

The currency and robustness of the existing data set is a potential barrier to an effective adaptation response. It is unclear if the projected climate forecasts within UKCP09, which dictate the required investment now, are sufficiently accurate and robust to inform the required business decisions. Please refer to the previous comments on the Landmark pilot project.

There is also a need for stronger links between the forecasts and the actual projected impact at the local, regional and national environment level i.e. the level of rainfall, frequency of severe events, change in wind levels, the degree, extent and depth of flooding, increased rates of erosion and the exacerbation of land movement etc. that will impact on all sectors.

It remains difficult to accurately predict the level of funding needed by the regulated businesses for long term adaptation measures due to the current periodic price control investment cycle. A detailed process of assessment led to Ofgem determining the allowed level of revenue and investment for the companies only covering the period from 2013 – 2021, including any expenditure required for adaptation.

Have new barriers been identified? Are these being addressed? If so, how?

Any interdependencies with other sectors that are identified, and which impact on the operation of the gas networks, have been included within the company risk and business action plans.

Further research and analysis into climate change impacts would certainly allow risks to be better understood.

9 Monitoring and Evaluating

How effectively has consideration of climate change risks been embedded within your sector or organisation?

There is an increasing level of awareness within the companies and its employees on climate change risks and the requirements for both mitigation and adaptation response. This is aided by the sharing of information and best practice via ENA, the industry body for the sector. ENA represents both the gas and electricity network companies providing opportunities for further liaison and learning opportunities as all energy sector companies are designated as Reporting Authorities and share some common issues.

The gas network businesses already demonstrate comprehensive existing management of their assets and resilience to existing and future climate impacts. Increasingly this is seen as a business as usual aspect of risk management. This work is further supported by the sector's involvement in wider national Government resilience and emergency response fora.

How effective have organisational monitoring and evaluation processes been to ensure adaptation responses are implemented and on track? If these have not been effective, what barriers prevented this?

As per some of the previous answers, actions detailed in the Adaptation Reports continue to be monitored. These Action Plans have been incorporated within the company business plans as appropriate based on the level of risk.

Progression against the understanding of specific issues, such as flooding risks, coupled with experience of recent events has moved the companies forward in their understanding. Local impacts of river and coastal erosion on assets are also monitored and investment is made where required. Greater understanding and analysis of ground movement is potentially one area requiring further investigation, but monitoring parameters within existing risk and incident management systems provide assurance on any future required action.

How effective were monitoring and evaluation processes been in determining how the organisation/sector handled recent extreme weather conditions?

The planning of emergency responses in all conditions is part of business as usual practice, and whilst every severe weather episode provides learning and continuous improvement opportunities, the sector managed the recent extreme weather conditions without significant unforeseen problems. No unforeseen changes to the sector approach to adaptation have been identified from these events.

Has the sector/organisation identified and financially benefitted from implementing adaptation actions? Perhaps cost benefit analysis, fewer working days lost, more efficient operations etc?

Minimal financial benefits have been identified by the companies to date, but there is an appreciation of the benefit of early adaptation response where necessary to help mitigate future costs. The costs incurred in resourcing adaptation related work are subsumed within planned operational expenditure.

Has there been sufficient flexibility in the approach to adaptation within the sector/organisation, which allowed you to pursue alternative courses of action? If not what remedial measures could you take to ensure flexibility?

The industry already works within a framework where long term investment, and its underlying assumptions, is subject to periodic regulatory review. The long term safe operation of the gas networks is separately subject to the approval of safety cases with the Health and Safety Executive on a regular basis. These existing arrangements comfortably sit alongside the Adaptation Reporting framework and provide a sufficiently flexible approach.

10 Opportunities and Benefits

What action have you taken to exploit opportunities?

Limited opportunities have been identified by the companies to date.

How effective were your efforts?

No relevant information to report.

12 Review and Management of Identified Risks

Within our First Round Report, a number of medium and high risks were identified and an action plan developed to address these. Our progress against this action plan has been reviewed in table 12.1.

Whilst in the process of addressing the medium and high risks, those risks identified as being of low significance were reviewed in-line with our internal strategic risk register and procedures. It has not been considered necessary to elevate any of the low risks to medium or high significance.

Table 12.1 Implemented Actions

| Summary of actions (as set out in the First Round Report) | Progress on implementation of actions | Assessment of extent to which actions have mitigated risk | Benefits/challenges experienced |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Develop a climate change management procedure to specify requirements for climate change management within our organisation. | Procedure written and actions integrated into our environmental management system. Complete. | Greater understanding of the potential implications of climate change. | Enhancement of the environmental culture and understanding within our organisation. |
| Undertake a review of relevant policies and procedures to identify scope for reinforcing the requirement for assessment of climate change implications. | Procedures that govern the installation of new / replacement gas infrastructure are in the process of being reviewed to highlight where climate change needs to be considered. Ongoing. Climate change required to be considered for all major network investment decisions before funding is approved. Ongoing. | Climate change is being considered at the planning stage of major asset investments and measures are being incorporated into their design and construction to take into account climate change issues where identified. | Improved quality of information and data available to our asset managers. More robust planning processes and increased asset integrity. |

| Summary of actions (as set out in the First Round Report) | Progress on implementation of actions | Assessment of extent to which actions have mitigated risk | Benefits/challenges experienced |
|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Review flood risk management process and incorporate a requirement to assess future climate projections.</p> | <p>Identification of key assets to the business. Flood risk has been assessed against current EA flood maps and climate change forecasts to identify those assets at most risk.</p> <p>Complete.</p> <p>Mitigation measures, such as flood defence work and plant relocation are being included in site upgrade works for those that are most vulnerable.</p> <p>Ongoing.</p> | <p>Assets are currently capable of resilience to current climate flood impacts (as demonstrated by governors and pressure reducing equipment continuing to operate whilst being submerged during recent flooding events).</p> <p>Work has commenced on improving drainage at an offtake site that regularly floods outside of extreme weather events.</p> | <p>More robust planning processes are being used across the business and increased asset integrity has been experienced.</p> <p>There are considerable difficulties in appreciating the relationship between precipitation forecasts and associated flood depths and therefore the degree to which additional measures will be required.</p> |
| <p>Develop a risk-based programme for conducting wildfire risk assessments at our sites and implement remediation measures as necessary.</p> | <p>Critical National Infrastructure (CNI) programme, which focuses on protecting our most significant assets, is undertaking vegetation clearance within 3m of site boundaries, which amongst other things will minimise the impact of wildfires.</p> <p>Ongoing.</p> | <p>The CNI programme is ensuring adequate delivery of action through the works being undertaken.</p> | <p>More robust planning processes and increased asset integrity.</p> <p>Wildfire events are difficult to forecast with any degree of accuracy and as a result additional guidance in relation to such events would be beneficial.</p> <p>Sites are typically in remote locations that are often surrounded by grassland or forest.</p> |

| Summary of actions (as set out in the First Round Report) | Progress on implementation of actions | Assessment of extent to which actions have mitigated risk | Benefits/challenges experienced |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Develop a scope of works to better understand the risks to pipelines from river erosion and develop remediation programmes as necessary.</p> | <p>SGN have an inspection regime in place to highlight rates of erosion on major pipelines.</p> <p>Complete.</p> <p>The results of the inspections inform the need for investment to protect pipelines at risk.</p> <p>Ongoing.</p> | <p>Procedures in place adequately manage the impacts of river erosion to major pipelines.</p> | <p>More robust planning processes and increased asset integrity.</p> <p>There is likely to be a need to increase inspection frequencies should flows in watercourses increase significantly.</p> <p>The Landmark climate change model, currently in development, should greatly assist in identifying assets at risk.</p> |
| <p>Develop a scope of works to better understand the relationship between the vulnerability of critical IT systems and extreme weather events and develop remediation programmes as necessary.</p> | <p>Our data centres are provided by a third party supplier as part of a managed service agreement.</p> <p>This agreement is monitored regularly for BCM purposes and measures can be implemented to ensure the continued provision of IT services.</p> <p>Complete.</p> | <p>The third party supplier was subject to the First Round Reporting of Climate Change Adaptation and also uses these data centres</p> <p>This has provided a level of assurance that the data centres would be able to cope with an extreme weather event.</p> <p>If at some point in the future the level of reliance was considered too low we would seek to relocate our assets or find an alternative supplier.</p> | <p>More robust planning processes and increased asset integrity.</p> <p>This is an interdependency, where we will seek assurances from the third party supplier that they will be able to continue to provide service without any problems.</p> |

| Summary of actions (as set out in the First Round Report) | Progress on implementation of actions | Assessment of extent to which actions have mitigated risk | Benefits/challenges experienced |
|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Review BCM plans to ensure severe travel difficulty resulting from extreme weather events is accounted for. | Extremes of weather feature in our BCM plans and have been successfully tested over recent extreme weather events. Complete. | Improved technology rolled-out to the business through our Evolve programme has improved the business's ability to work remotely. We understand from the review that there is likely to be an increase in enacting our BCM protocols. | The implications of extreme weather events are understood better than they were before embarking on the climate change reporting process. We are now considerate of climate change factors when developing BCM plans, which gives us greater assurance that they are robust. |
| Develop our land management strategy to assess the flood risk of sites with known or suspected contamination present. | Work has been carried out to highlight contaminated sites within current floodplains. Complete. Sites seen as being at risk from this impact have been re-prioritised within the work programme so that risks can be mitigated before the climate change forecast is realised. Complete. | The programme of site inspection and clean-up is in its infancy and as yet few sites believed to be at risk of impact have been addressed. It is however anticipated that the inspection of sites within the current work plan (running until 2021) will address all those at significant risk of flood impact. | It is anticipated that the extent to which sites are to be remediated will be increased in areas where flood risk is high. This will result in higher costs for remediation works, however will increase environmental benefits. |
| Ensure implications of climate change are considered as part of all significant investment decisions. | Process introduced to ensure that all asset investments take into consideration climate change in the investment papers that form basis for decision making. Complete. | All new build gas sites and retrospective gas site refurbishments are constructed with consideration of current and future climate change impacts over the life of the asset. | Increased confidence in investment decisions. Utilisation of climate data in areas of the business that need to consider the operational lifespan of assets. |

| Summary of actions (as set out in the First Round Report) | Progress on implementation of actions | Assessment of extent to which actions have mitigated risk | Benefits/challenges experienced |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <p>Assign risks to relevant risk owners to be articulated and embedded in our existing business risk process.</p> | <p>Risks from climate change have been identified and action owners identified at leadership team level.</p> <p>Complete.</p> <p>Internal TeamTalk briefings have been used to raise awareness and refresh knowledge across the business.</p> <p>Complete.</p> <p>Changes have been made to the business risk procedures to include Climate Change Adaptation.</p> <p>Complete.</p> | <p>Climate Change Adaptation will be considered on the same basis as other risk to asset such as security, safety and environmental impact.</p> | <p>Enhancement of the environmental culture and understanding within our organisation.</p> |