Executive Summary

Business Plan

Appendices

30 November 2011

Southern Gas Networks
A Scotia Gas Networks Company

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Appendices

See separate document

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Jacobs Engineering UK Ltd
– Review of Scotia Gas Networks Business Plans

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– IT Leaders Scorecard, May 2011 (Prepared for SGN)

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How to use this Document

Introduction

This document is Southern Gas Networks' Business Plan for the eight year period from 1 April 2013 to 31 March 2021. It has been developed following detailed discussions with our customers and other stakeholders over the past year.

The Business Plan is made up of three parts:

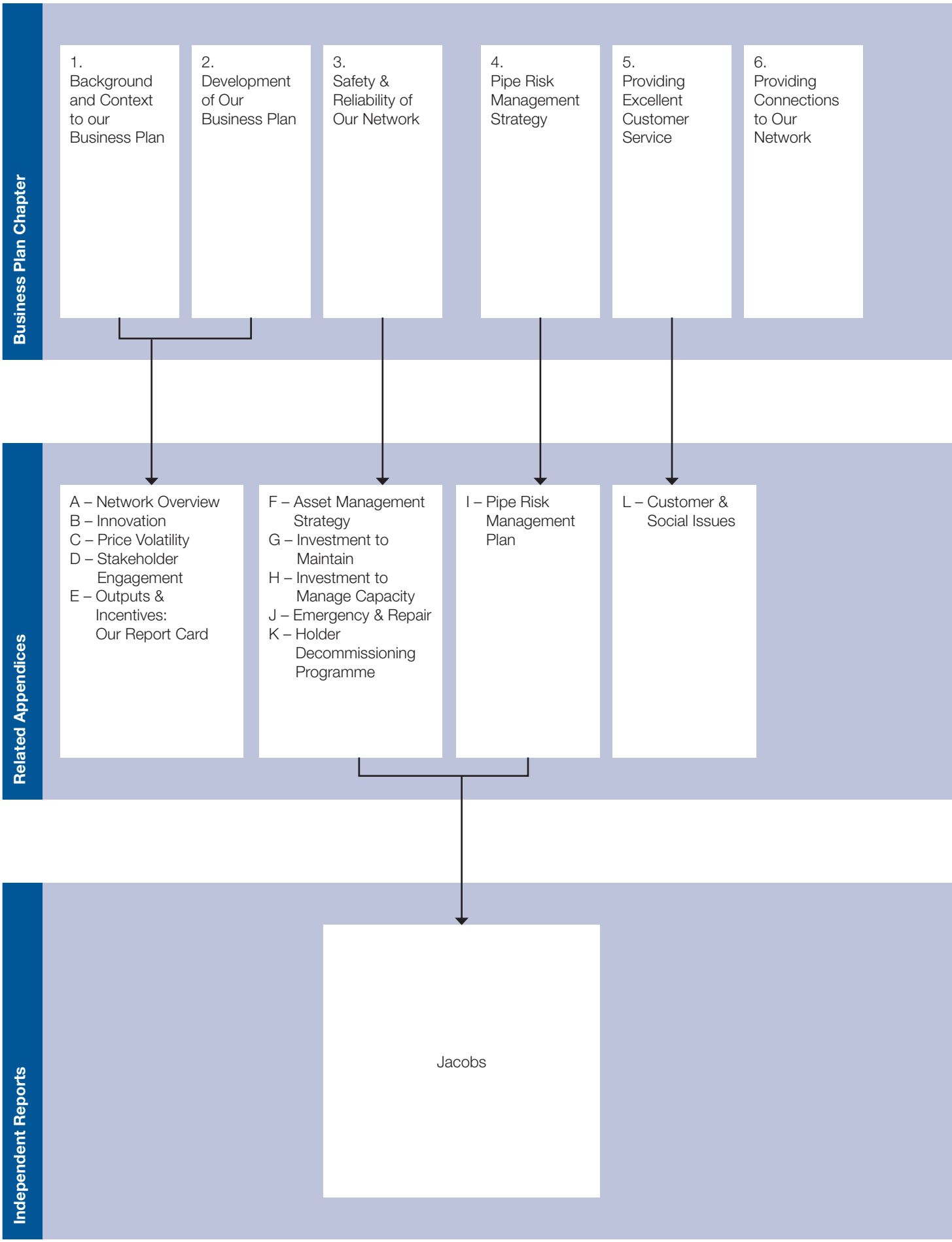
- The Executive Summary – a standalone publication, also available on our website;
- The Business Plan – a publication to be read in conjunction with the Appendices. It is also available on our website; and
- The Appendices – these provide the background and detailed justification for our proposals, along with a series of independent supporting papers. All our appendices are available on our website www.sgn.co.uk but some commercially sensitive information has been removed.

Navigating the Document

Please see the next page for a map of the Business Plan and related appendices.

Glossary

A Glossary is provided at the end of this Business Plan.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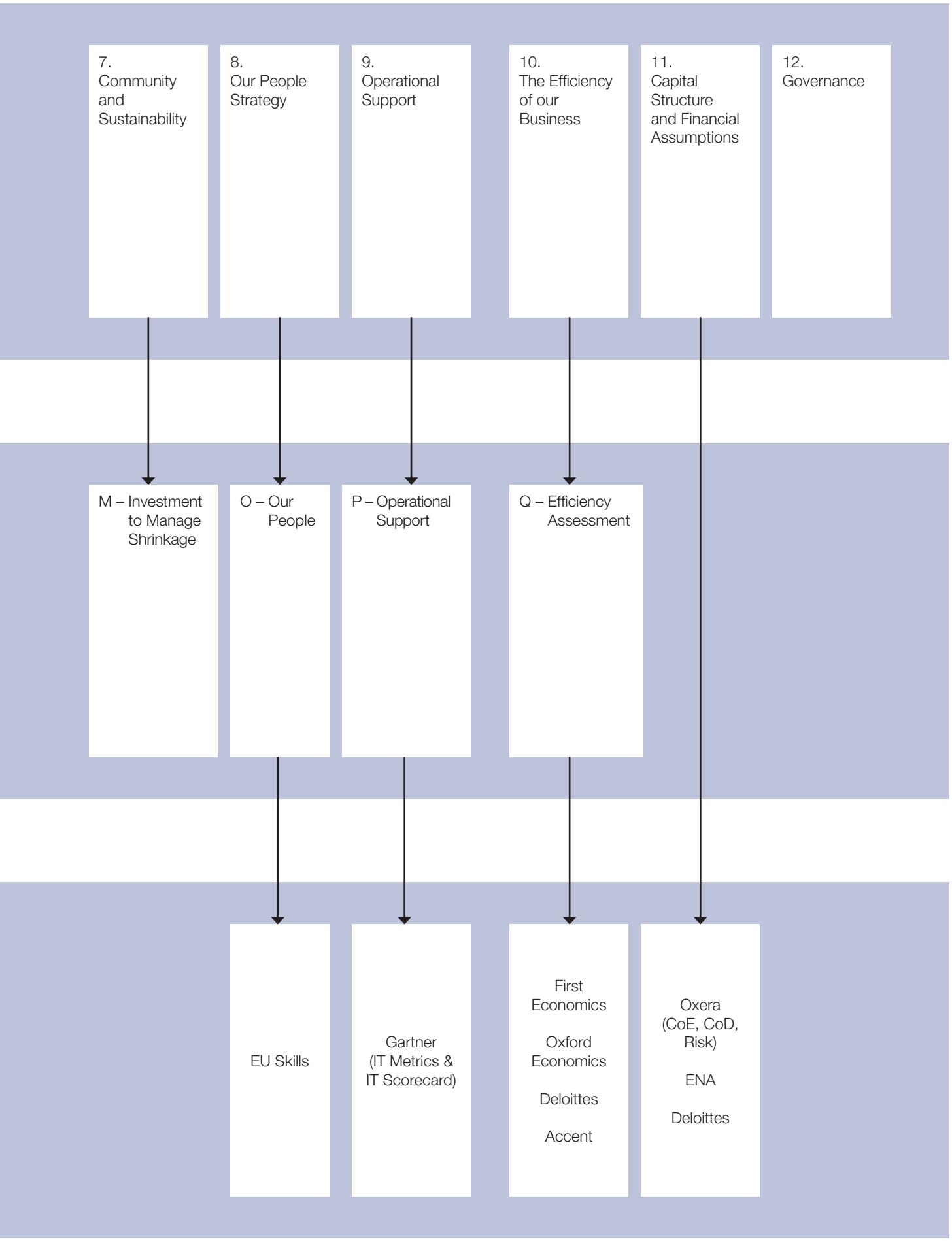
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Background and Context to Our Business Plan

Summary

In December 2012, Ofgem will set the allowed revenue for the Gas Distribution Network owners (GDNs) for the eight years from 1 April 2013. Along with an agreed outputs and incentives package, this will set the price limits for the regulatory price control period referred to as 'GD1' which runs from 1 April 2013 until 31 March 2021.

Our aim is to be the leading operator of gas networks in the UK. We are already performing in the upper quartile in a number of areas, once regional factors such as urbanity are taken into account; but we can still improve. This Business Plan is intended to move us to the frontier in all aspects of cost performance by 2021.

We are seeking c. £3.8bn of total expenditure over the GD1 price control period, along with a comprehensive outputs and incentives package designed to ensure we are rewarded for good performance or penalised for poor performance. The Business Plan is designed to deliver long term benefits for our existing and future customers through a safe, reliable and sustainable gas transportation system.

We intend to deliver the following key outputs through to 2021:

- Emergency response: we will continue to meet the 97% attendance standard for gas escapes;
- Risk: we will reduce the risk of gas escapes from iron pipes by 38%;
- Asset health: we will improve our health and condition of our assets, ensuring they are in a good or serviceable condition as defined by Ofgem's asset health index 'HI2';
- Environment: we aim to meet or beat Ofgem's target for reducing leakage from our network; we will raise awareness of the dangers of carbon monoxide; and
- Customer service: we will reduce customer complaints by 30%; we will improve our overall customer satisfaction score to '9 out of 10'.

We also intend to remove all 89 gas holders located on our network during GD1 to improve safety and environmental impact. This strategy has the broad approval of our stakeholders, including the Health and Safety Executive (HSE).

These benefits can be delivered with no significant impact on customers' bills; the improvements we will deliver will result in an average annual increase of around 1 p per day, in real terms, for a typical household.

1.1 Scotia Gas Networks

Scotia Gas Networks (SGN) is the UK's second largest gas distribution network company and our primary focus is on delivering gas to our customers safely, reliably and efficiently. We are a privately owned company; our shareholders are SSE plc, Borealis Infrastructure Management Inc and Ontario Teachers' Pension Plan Board Investments (UK) Ltd.

We own and operate two licensed gas distribution networks that cover a diverse area. In England, we operate from Dorset in the west to Dover in the east. Our networks stretch as far north as Milton Keynes and Banbury and include all London boroughs south of the Thames.

We deliver gas to 90% of Southern households and around 4.0m customers.

1.2 The GB Gas Transportation Network

The gas transportation network for Great Britain (GB) comprises a national transmission system, which is owned and operated by National Grid (NG), and is connected to on-shore beach terminals, the United Kingdom (UK) interconnector, and the two LNG importation terminals at Isle of Grain, Kent and in South Wales. Gas is processed at each of these entry facilities to ensure the quality meets the UK specification and is transported via the National Transmission System (NTS) to directly connected customers, e.g. power stations, and to the gas distribution companies. The GDNs then transport the gas through their networks to the customers' control valve.

These assets are configured as shown in Figure 1.

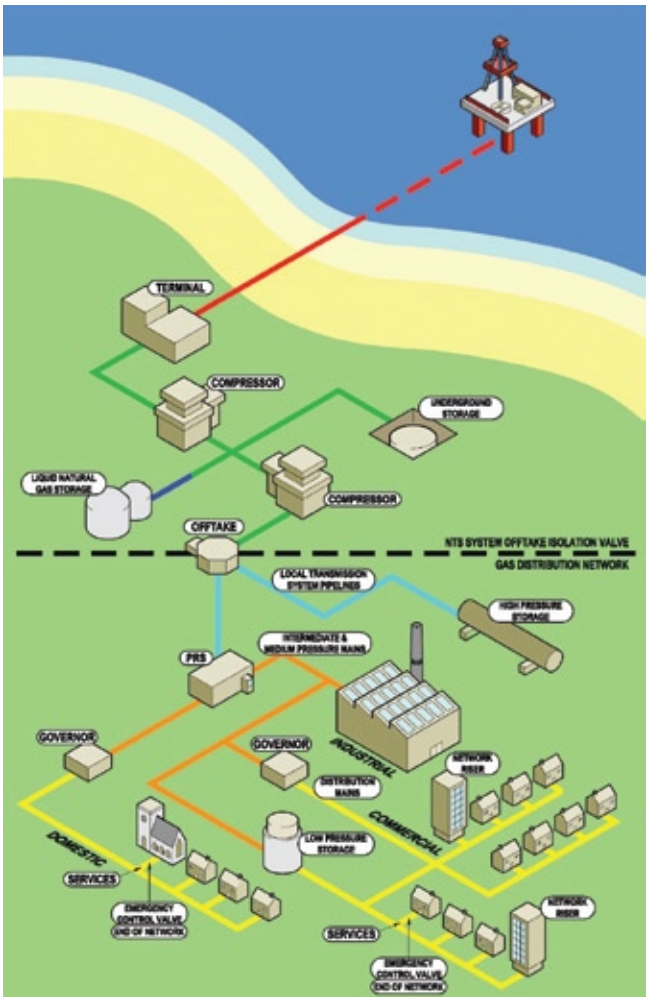


Figure 1: GB Gas Transportation Network

1.3 Southern Gas Networks' Licence Area and Network Metrics

Southern Gas Networks operates from Dorset in the west to Dover in the east. Our networks stretch as far north as Milton Keynes and Banbury and include all London boroughs south of the Thames. We deliver gas to 90% of Southern households and serve around 4.0million customers.

We have a total of 15 national offtakes (including 4 entry points), 1,755km of high pressure pipeline, 163 pressure reducing installations, 6,397 district and land governors; 23,044 service governors and 47,746km of distribution mains and associated gas services. Our Regulated Asset Value, at 1 April 2011, was £2.8bn.

Further detail regarding our network is provided at Chapter 3 and in Appendix A: Network Overview.

Development of Our Business Plan

Our Vision

Our aim is to be the leading operator of gas networks in the UK, operating a safe and secure gas network consisting of a predominantly polyethylene pipeline system by 2021, having low emissions and able to accept multi-source and green gas.

Our investment strategy aims to ensure that we maintain and improve the health of our existing assets ensuring that, over the long term, our assets have the flexibility to adapt to the challenges intrinsic in a low carbon energy transportation infrastructure.

We will demonstrate outstanding performance in customer service, minimise our environmental impact and be responsible to the communities we serve.

2.1 Our Goals and Strategic Objectives

In order to become the leading operator of gas networks in the UK, we will deliver high standards in safety across our network operations. We will demonstrate outstanding performance in customer service, environment and the community we serve. We will ensure our workforce is competent, efficient and flexible to changing demands. We encapsulate these goals as:

- Acting safely;
- Providing excellent service;
- Being good neighbours; and
- A business for the future.

Detailed below are the strategic objectives that will help to achieve these goals:

Safety

We aim to be the leading utility company on safety in the UK. We will deliver the highest standards in safety across our network against the key outputs.

- We aim to achieve zero injuries to people
- We aim to achieve zero significant incidents as a result of loss of containment from our network assets
- We aim to be in the top quartile of European utility companies.

Customer experience

We aim to be the leading gas distribution company on Ofgem's core efficiency measure. We will demonstrate outstanding performance against the customer service outputs.

- We aim to achieve upper quartile operational performance when measured against the guaranteed standards of performance and our licence conditions
- We aim to achieve year-on-year improvements on the customer service benchmarks.

Community and sustainability

We aim to enhance a culture and process to care for the environment and the communities we serve.

- We are targeting a year-on-year increase in community projects and expenditure on charity and community support programmes
- We aim to achieve annual operational expenditure savings as a result of our environmental programmes.

Innovation

We will continue to reinforce a culture of innovation and development that delivers radical ideas and measurable improvement.

- We will ensure that innovations are implemented across the business within six months of approval
- We will aim to encourage the development of green gas
- We will seek to utilise the full value of our Network Innovation Allowance, the replacement to the Innovation Funding Incentive
- We will participate fully in the Networks Innovation Competition.

People

We will ensure our workforce delivers year on year improvements in employee skills, capabilities and performance, while being flexible to changing demands.

- We will carry out annual employee engagement surveys and achieve a year-on-year improvement in survey results of 5%
- We will continue to carry out objective setting and performance appraisals down to team manager level
- We will continue with our focused apprenticeship programme.

Efficiency

We will produce frontier performance on Ofgem's core efficiency measures.

- We aim to be benchmarked as the most efficient on controllable operating costs
- We aim to be recognised as having the most efficient capital expenditure programme
- We aim to outperform the replacement expenditure programme.

Our Business Model

We operate a geographical depot structure based upon the SSE Power Distribution model that has taken that business to the frontier as an electricity distribution network operator. The depot structure has allowed a greater focus on workload, improving our planning activities and allowing much greater flexing of work between processes. The model allows for greater accountability and more local interaction with our customers. We believe 'locals serving locals' is essential for providing a safe and reliable network for the future.

We have focused on in-sourcing in a number of key areas. We have in-sourced a large proportion of our contractor workforce, which allows us greater operational control and has helped to reduce costs. Further cost savings have been made by moving away from the National Service Agreements (NSAs) with National Grid. In June 2011 we implemented our own Distribution Network Control System and now have full control of our gas pipeline assets. Call handling is now our only significant NSA, and we are currently carrying out trials to bring this in-house. Our long term aim is for all calls related to our network to be directed to our own agents, which we believe will improve communication and the service provided to our customers.

Best practice

Our Business Plan has been developed using the depth of knowledge, experience and best practice inherent in our company. The efficient strategy in our project management skills has lead to greater cost certainty in delivery, while our leading involvement in the development of new participants in transmission construction has increased the industry resources in this field. Our continued commitment to work with other industry players will ensure our role as an influential participant in the UK gas market.

2.2 The Future of Gas

Summary

Gas is the future; we believe by greening it, it will ensure plentiful supplies and it can be part of, and assist in, the transition to a low carbon economy.

We are committed to playing our part in helping to move the UK to a low carbon economy. Technological development is essential for any low carbon future, and both time and funding are needed to ensure that technology options are fully explored. Meeting the government's emissions targets will rely extensively on the introduction of renewable energy generation. The introduction of carbon capture and storage (CCS) for fossil fuel plant will further support the transition to the low carbon economy

National targets for renewables and climate change require significant changes to the UK energy system but it is clear that gas will remain critical in maintaining a secure and diverse energy mix. The use of gas in electricity generation will of course be vital up to and past 2050. This is likely to be for baseload generation with CCS but also for peaking plant to supplement the intermittent renewable generation and the inflexible new nuclear generation when it comes on line.

Following external research by Redpoint[1] into the future for gas, we firmly believe gas networks have a viable, long term future. They are an invaluable asset for our customers, both now and out to 2050 as the UK moves to a low carbon economy. The gas networks are flexible: they are able to connect biomethane entry; the transportation assets can be utilised for supplying gas fired power stations with CCS; and they could support the hydrogen community, if domestic fuel cell Combined Heat and Power (CHP) technology becomes main stream.

The Redpoint research modelled four scenarios that looked at how gas will be consumed, transported and sourced in the UK out to 2050. The four scenarios are summarised in Table 1 on the next page:

Extracts of the key findings from the Redpoint work show that:

- There are credible and robust scenarios in which gas could play a major ongoing role in the GB energy mix while meeting both the 2050 carbon targets and the 2020 renewable energy targets;
- Pathways with ongoing gas use could offer a cost-effective solution for a low-carbon transition relative to scenarios with higher levels of electrification; and
- All potential pathways to a low-carbon future will involve significant investment in new technology, with its associated risks. Given the level of uncertainty regarding these issues, there appears to be significant value in retaining the option for a 'high gas' future.

[1] Redpoint Consulting, Gas Futures Scenarios Project

		DIMENSION 2: Commercialisation of Energy Storage Technologies	
		Low / Slow	**High / Rapid**
DIMENSION 1: Commercialisation of Carbon Capture and Storage	**High / Rapid**	**GREEN GAS** **Transmission-delivered gas: HIGH** – gas + CCS – some unabated gas for balancing **Distribution-delivered gas: HIGH** – 'dual fuel' world for domestic heating – biomethane injection – district heating + CCS – some use of CNG in transport	**STORAGE SOLUTION** **Transmission-delivered gas: HIGH** – gas + CCS – small amount of unabated gas – additional balancing via electricity storage **Distribution-delivered gas: LOW** – heating and transport largely electrified – heat storage used to balance seasonal heat
	Low / Slow	**GAS VERSATILITY** **Transmission-delivered gas: LOW** – renewables / nuclear dominate – some unabated gas for balancing **Distribution-delivered gas: MEDIUM** – biomethane at max potential – some use of CNG in transport	**ELECTRICAL REVOLUTION** **Transmission-delivered gas: LOW / NONE** – renewables / nuclear dominate – balancing via electricity storage, flexible nuclear, interconnection and DSR **Distribution-delivered gas: LOW / NONE** – heating and transport largely electrified – heat storage used to balance seasonal heat

Table 1: Redpoint report scenario summary table

2.3 Innovation

Summary

Innovation is embedded within our culture. One of our strategic objectives is to continue to reinforce a culture of innovation and development in our business.

We do this currently through our internal 'IGNITE' initiative and externally through our utilisation of the Innovation Funding Incentive (IFI). Going forward, we have embedded a number of innovation initiatives within this Business Plan and provided evidence of our intention to fully utilise the new Network Innovation Allowance.

While disappointed in the amount of funding available under the new Network Innovation Competition we intend to develop projects, in partnership with third parties, which will aid the delivery of a low carbon energy sector, along with projects that could deliver wider environmental benefits.

Introduction

IGNITE, our internal ideas management scheme, has been central to our development of this innovative culture. Our focus has been on the encouragement, progression and implementation of ideas from everyone that improves our thinking, products and processes. Conscious of the hurdles in implementing a cultural change within a business we have adopted a strategy of sustained communication with our staff and a focus on making ideas a reality. This sustained approach to engagement has seen the number of ideas submitted to our scheme from our workforce increase from an average of 11 submissions a month in 2008/09, to an average of 54 submissions a month in 2010/11. We intend to use this cultural shift as an opportunity to utilise the knowledge and experience within our business to provide valuable input to the key deliverables within the RIIO framework and deliver real change during GD1.

During the current price control period we have undertaken a balanced programme within our IFI portfolio, with our programme based on the 5 Sustainable Themes:

- Managing the transition to a low carbon economy;
- Eradicating fuel poverty and protecting vulnerable customers;
- Promoting energy saving;
- Ensuring a secure and reliable gas and electricity supply; and
- Supporting improvement in all aspects of the environment.

This approach ensures we deliver technical development, the right degree of innovation and customer value, and continue to develop our thinking and ways of working to ensure we spend the right money on the right projects at the right time. We intend to continue this approach for the replacement to IFI, the Network Innovation Allowance, during GD1.

Stakeholder Engagement

We have not only been working with our own workforce to embrace the diverse level of knowledge within our business, we have extended our IGNITE scheme to our key suppliers. In 2009 work was performed to ensure that our suppliers

were undertaking innovation and bringing us the latest market thinking. In fact, during our discussions we found that suppliers had been attempting to bring innovations to the GDNs but robust processes were not in place to accept, consider, and act upon them. This feedback was received from a number of our key stakeholders; and based on it we launched our External Partner Form in early 2010. The form is a simple idea designed to enable each supplier to understand our business and, by having our vision and values close to hand, can ensure that the ideas they wish to submit directly fit with our corporate strategy. This method of engagement has been well received, with seven External Partner Forms being submitted to date, with two leading to collaborative projects being undertaken.

We are currently building a strategy that enables us to use social media to participate in more open innovation. Our first social media page has been set up and we are learning how to stimulate innovative discussions to answer challenging questions. It is anticipated that this type of approach will allow for engagement with a wider audience across the energy sector and also allow stakeholders from outside the energy sector to contribute directly to the debate and offer an alternative approach to resolution and delivery.

We are also keen to participate in key issues within the UK energy sector. We are currently working on a number of collaborative projects with third-party businesses and intend to continue this approach during GD1.

Experience to date

As discussed above, our approach to innovation covers a wide spectrum. We embrace ideas from our staff on a broad spectrum of matters, from making our company a better place to work through to our leading UK energy sector change projects such as biomethane injection. Our commitment to the full spectrum of innovation can be seen in the examples below:

Picture 1: Realising an idea

We work to make as many ideas reality as we can. Even simple inventions are hard to fully understand while on paper and that is why we are working with a charity based in Southampton and our own IGNITE workshop to create prototypes.

However, our experiences have shown us that inventions remaining just inventions are no good. They must be pushed a step further to becoming innovations or putting it another way, use them! Picture 2 shows one of our IGNITE ideas in use under a field trial on one of our replacement projects. This piece of equipment aims to improve productivity, replace more services back to the existing meter position and reduce manual handling issues.

Picture 2: An invention into innovation

Picture 3 shows one of our inventions to reduce the environmental impact of our activities. Our 'GECO' was built from a staff suggestion and aims to reduce the amount of gas released to the atmosphere, during the process of mains abandonment, by pumping the gas back into the live system. This invention will not only challenge us technically but will push our thinking around the policies and procedures involved in this type of work and, if successful, will provide environmental savings and commercial opportunities.

Picture 3: The 'GECO'

Picture 4: Biomethane flows into Didcot

Picture 4 shows our biomethane collaboration project. Our success with this project is due to the collaborative efforts of many parties and a commitment to take measured risk to push the boundaries, taking a concept through the full life cycle of innovation to delivery.

Our Strategy for GD1

Our innovation strategy for GD1 and beyond is detailed in Appendix B.

Within our Innovation Strategy we have set out 7 guiding statements that provide us with an approach to innovation within our business. These statements are new to us and aim to provide us with the basis to build projects that cover all types of innovation, including commercial, technological and operational. Our programme will span the full spectrum of innovation from research into new areas and development of new technologies through to trials and demonstration of equipment and/or commercial arrangements.

Our 7 guiding statements

1. Embed innovation into our long term strategy as well as our daily life
2. Build an environment for experimentation and measured risk
3. Allow people to think freely and challenge the norm
4. Provide the people, processes and places that embrace innovation
5. Undertake ‘open innovation’ to inform and listen to our colleagues and third parties
6. Innovation is to become a part of our daily life
7. Ensure we monitor future trends and contribute to the debate

Innovation Mechanisms

We fully recognise the opportunities for innovation that Ofgem have provided and we aim to fully participate in all three areas as detailed below:

1. Our Business Plan

We believe that our Business Plan is well justified. It focuses on innovative approaches and solutions for driving our business forward. The justification for innovation within the plan, where appropriate, is being presented as a proven business case showing that the innovative approach is better at delivering the outputs, and provides flexibility to respond to a range of scenarios with its costs justified over a longer period than GD1.

One of our proposed innovation projects is in the area of pipeline repair/rehabilitation. The overall aim of this project is to demonstrate that Cured In Place (CIP) and Polyurethane (PU) spray linings are ‘fit for purpose’ as a permanent repair/rehabilitation technique for gas distribution mains. This project includes a programme of work that will demonstrate whether CIP and PU spray lining techniques can deliver a level of risk that is acceptable for all stakeholders.

2. Network Innovation Allowance

We intend to fully utilise our Network Innovation Allowance to address key challenges in and out of the low carbon/environmental sector, across the full range of the innovation spectrum from research projects through to demonstration projects on our network. Our learning during the current price control period with IFI has enabled us to investigate and understand the value of collaboration, and we intend to increase activity in this area.

To date, we have worked across all the IFI Sustainable Themes. Examples include PE asset life research, alternative inspection techniques and alternative forms of pre-heat.

3. Network Innovation Competition (NIC)

By its very nature, this initiative will be a competitive process. It is therefore not appropriate to provide too much detail of our ideas in a public document. Our focus under the NIC will be on developing ideas and products to aid the delivery of a low carbon energy sector, along with projects that could deliver wider environmental benefits. We intend to fully participate in the NIC using our 7 guiding statements to ensure we participate at the right time, with the right focus on topics that will add value to all GB customers and to our business.

2.4 Dealing with Uncertainty

Summary

Our economy is in the midst of the worst recession in over fifty years. In the UK (and elsewhere) this means a prolonged period of instability in the financial markets; and for the energy network sector, reduced access to capital markets at a time when continued investment is required to replace ageing assets and ensure safe, reliable networks for the future.

In developing our Business Plan, we have sought to identify and understand all of the risks for our business during the GD1 price control period. We have assessed these risks in terms of the likelihood of them occurring and in terms of the impact that they may have on our ability to run the business efficiently.

Where possible we have sought to mitigate risk and uncertainty within the Business Plan. However, we have identified a number of uncertainties that require to be dealt with via specific re-opener mechanisms. These include the impact of smart metering on our business, the potential introduction of lane rentals during GD1 and the potential for legislative change that could adversely impact our business. Appendix C provides further detail of these additional mechanisms.

Managing risk and uncertainty

It is clear that the energy sector will undergo significant change as the UK moves to a low carbon economy. The Redpoint scenarios show that the future use of gas is uncertain but, as noted previously, the gas networks are adaptable and could be used for green gas, CCS supply or even to support the hydrogen community. In addition, the European Commission's Energy Roadmap 2050 (published in November 2011) concludes that 'gas will be critical for the transformation of the energy sector'. This strongly supports our firm view that the gas networks have a long term future.

Furthermore, before investing in infrastructure we have sought to look at alternative delivery arrangements such as new commercial arrangements, new operating regimes and demand side management alternatives. Where appropriate we have kept options open with a view to investing when the future becomes clearer, thus minimising the risk of stranding. The capital investment proposed within this Business Plan will therefore not compromise the ability to use our assets effectively and efficiently regardless of how the future unfolds post 2021.

Examples of how we have addressed uncertainty in our Business Plan include the use of demand forecast scenarios (Appendix H) and the assessment of new IT solutions for the period (Appendix P).

Nevertheless, there will always be uncertainties about what will happen over the course of a price control period, more so now that GD1 will run for eight years. Ofgem's view, with which we agree, is that risks should be borne by the party best able to manage them.

For example, we have been working with NG NTS to look at ways of reducing overall system investment for our customers. To meet our customers' demands we need NG NTS to provide exit capacity and pressures at our NTS offtakes and NG NTS has obligations to do this based on the process set out in the Unified Network Code (UNC). Through the careful management of our network we have agreed to reductions in the pressures the NTS provide to us and NG NTS has been able to avoid investment in its network. Nevertheless, given that RIIO-GD1 will run until 2021, there is still a risk that investment will be required on our network due to the needs of NG NTS. If this occurs we would expect to be allowed to log up the efficient costs of any such investment and recover these at either of the re-opener windows or the mid-point review.

Management of risk

Risk management is a fundamental part of our business. The main SGN Board is responsible for our system of risk management and internal control and for regularly reviewing its effectiveness. The Board has delegated aspects of this process to the Audit Committee which bi-annually reviews reports from Group Audit on the management of the system of internal control presented to the Audit Committee by the Group Audit Manager. The Audit Committee assesses the effectiveness of our system of internal control based on work carried out by Group Audit in conjunction with the results of reporting by management.

We have an SGN 'Group Strategic Risk Map' that is the basis for the bi-annual review. In addition to the specific bi-annual review reported to the Audit Committee, risk registers are reviewed during and incorporated within delivery of the audit plan. Each department and major project manages its own risk register. Risks are assessed against an agreed set of criteria based around financial, environmental, safety or reputational impact. Controls and assurance mechanisms are put in place to manage and / or mitigate risk.

Our Executive Committee is responsible for implementing policies on risk and control and for reporting regularly to the Audit Committee on significant risks and the effectiveness of the system of internal control in managing those risks. Details of any significant control weaknesses or breakdowns would be included in the Audit Committee reports.

Uncertainty Mechanisms proposed by Ofgem

Ofgem has identified a number of key uncertainties as part of the price control review process, and have proposed mechanisms to deal with them. These mechanisms include volume drivers, revenue drivers, specific re-openers and pass-through items.

Furthermore, Ofgem has proposed a 'mid-period' review of the new outputs regime that is intended to manage the uncertainty around the development and implementation of new assessment and reporting regimes.

1. Financial uncertainty

There are a number of uncertainty mechanisms that Ofgem has put in place to deal with financial uncertainty during the eight-year price control period. These include a tax-trigger mechanism to deal with future changes in the tax regime, annual indexation of the cost of debt and continuation of the pension deficit repair mechanism.

Ofgem has also allowed the pass-through of business rates and licence fee costs. In addition, GDNs' allowed revenue will be indexed by RPI based on a 12-month average.

2. Repex policy

Ofgem has agreed a re-opener mechanism to allow for any material change to the mains replacement programme following the proposed HSE review of the new policy in 2017.

3. Street works and critical national infrastructure

Ofgem have allowed two re-opener windows (2015 and 2018) to capture changes to costs from developments to the streetworks regime and costs as a result of requirements from the Centre for the Protection of National Infrastructure (CPNI).

4. Changes to connection boundary

In the event of a change to the connection charging boundary, Ofgem has allowed a re-opener to enable GDNs to recover efficient costs incurred subject to a materiality threshold of 1% of total expenditure. Similar to the streetworks regime and CPNI, the re-opener is restricted to two 'windows' in 2015 and in 2018.

Additional uncertainty mechanisms

Notwithstanding the mechanisms proposed by Ofgem, we believe there is further, significant uncertainty which GDNs will have to address during GD1. RIIO-GD1 and T1 will be the first set of price controls lasting eight years and, as noted, at a time when the UK and the European Union (EU) are moving towards a low carbon economy. RIIO provides us with the opportunity to propose additional uncertainty mechanisms, with the relevant justification. We believe there are a number of additional areas of uncertainty that need to be addressed across all GDNs.

5. Lane Rentals

The Government recently published a consultation on its proposals for trials for lane rentals. The purpose of the consultation is to invite views on proposals to allow local highway authorities in England to implement "lane rental" schemes, under which they would charge a daily fee for the duration of works carried out in the street at the busiest times.

However, given that lane rental is not yet proven as a successful model for tackling disruption caused by works, the Government is currently considering lane rental schemes in just one or two areas: a major urban area and a non-metropolitan area. The Government considers that early evidence from such schemes would inform decisions on whether lane rental could usefully be applied more widely.

The outcome of any such trials is uncertain, as is the timing of any full roll out. In addition, the charges to be applied are not fixed at present. However, based on information we have seen to date, once implemented, this is likely to have a very material impact on our business. An uncertainty mechanism similar to that designed for TMA during the current price control period is therefore required to ensure that the efficient costs due to the implementation of any lane rental scheme are recoverable during GD1. The uncertainty mechanism should allow GDNs to recover the efficient costs incurred subject to a materiality threshold of 1% of total expenditure.

6. Impact of Smart Metering

The proposed supplier-led roll out of smart meters proposed for 2014 to 2019 will significantly impact upon GDNs with respect to the following:

- Where an emergency situation is at the property such as there is a smell of gas, the emergency control valve is found to be in a non-standard configuration or there are visible signs of deterioration of the service pipe; or
- Where it is found impossible to install a new meter at the current meter position due to, for example, restrictions in available space or an unsuitable meter location (i.e. meter is in a location that is not readily accessible to the consumer).

The potential impact of gas smart meter installation on networks could be significant both in terms of an increase in call out rates (including emergencies) and the cost of altering meter positions and replacing steel service pipes. The Energy Networks Association (ENA) has carried out a review of the likely impact and concluded that 16% of installations will require GDNs to carry out remedial work on related services.

Because of the uncertainty over the impact that smart meters will have on our business, we have not included any service related costs in our Business Plan submission. We believe that the recovery of efficient costs should be allowed via a re-opener mechanism at either of the proposed re-opener windows in 2015 and 2018. As per other re-opener mechanisms we propose the materiality threshold should be 1% of total expenditure.

7. Xoserve

Xoserve has a key role in meeting GDNs' licence obligations and there are significant uncertainties over Xoserve's role arising from the smart meter implementation programme and Ofgem's current review of its role and responsibility. For example, there are currently no clearly defined requirements around the role Xoserve will be required to undertake to support the Data Communications Company (DCC). Initial indications are that Xoserve will have a limited role in relation to facilitating information access controls for both large transporter supply points and possibly iGT supply. However, because of the current uncertainty over Xoserve's role and its costs, we believe that a pass-through mechanism for any audited efficient system costs associated with DCC type activities will be required. We propose that the pass through mechanism is similar in design to the NTS (Special Condition C8G) Xoserve pass-through mechanism for logged up Gemini costs.

8. Potential legislative change

Given the EU drive towards a low carbon economy, we believe that there is the potential for significant legislative change over the price control period with uncertainty over the impact on the energy sector. For example, across the UK, the impact of the EU 'third package' on energy network companies could be material, but much of the detail will not be known before the new price control is set.

In addition to this uncertainty, potential changes to our licence, to the UNC or to the major engineering codes due to legislative changes at national or European level are outwith our direct control. We believe this risk is significant and therefore propose a re-opener to enable us to recover the efficient costs incurred in implementing any legislative, regulatory or technical change during the price control period. We propose to utilise the two re-opener windows in 2015 and 2018 where a GDN can bring forward any legitimate additional cost incurred because of legislative changes up to that point. As with the streetworks and CPNI re-openers proposed by Ofgem, we will set a materiality threshold of 1% of total expenditure and would expect to provide clear evidence of the additional costs incurred to Ofgem.

2.5 Dealing with Price Volatility

Summary

At various industry meetings and at our stakeholder events, gas shippers, suppliers and customers have told us there is growing concern that the nature and scale of change in gas distribution charges is becoming more difficult to predict and understand.

We have listened to these concerns and understand the difficulties this creates. We have worked with our stakeholders to explore and explain the contributing factors and develop proposals that we believe will help address these concerns, while ensuring we can continue to finance our activities and provide the service our stakeholders have indicated to us they value and expect us to provide over GD1.

In response to our stakeholders' concerns we have developed proposals to introduce a sliding scale capping mechanism that will encourage GDNs to provide early notice of any significant changes to charges. We also suggest that the K factor range is widened. These proposals will be developed further as the price control parameters are finalised.

Appendix C sets out further details regarding the contributing factors, our forecast and actual price changes, our stakeholder engagement and proposals for change that we plan to develop with our stakeholders and implement for GD1.

Introduction

At the last price control review, Ofgem introduced a number of incentives aimed at improving the performance of the GDNs: those whose performance improves are allowed additional income, but those who perform badly are penalised. We are fully supportive of the incentive regime. We believe it drives efficiencies which are ultimately shared with the customer but by their nature, incentive payments can vary significantly year on year and be difficult to predict. This can have an impact on charges. For GD1, Ofgem has proposed a range of incentives for the GDNs and we have proposed a number of additional ones ourselves. In order to mitigate their potential impact on charging predictability it is proposed to introduce a lag on some of the mechanisms so the impact on allowed revenue is carried over to the next charging period and is more transparent to our stakeholders.

In addition to incentives, changes in customer demand and inflation can impact on the predictability and volatility of the charges we make to our customers. To improve predictability and minimise volatility of charges to our customers, we plan to develop a number of initiatives.

Stakeholder feedback

There is a dichotomy between price stability and price predictability. Discussions with stakeholders, particularly customers and shippers, have indicated some would like to see both. However, other shippers accept this is not possible and believe price predictability is more important than price stability. We have set out our proposals to address these concerns in Appendix C and these are summarised below.

Our proposals

Firstly, we plan to present proposals to introduce a sliding scale capping mechanism to encourage GDNs to provide early notice where significant change in charges is anticipated, while also allowing smaller adjustments close to real time to fine-tune positions. We propose the magnitude of changes in charges could be unrestricted if 9 months or more notice is provided, down to a cap of 5% real if changes are introduced with the minimum 2 months notice period under the UNC. Full details of our proposal are provided in Appendix C.

We would also like to widen the amount of over recovery that can be carried forward in any year (the K factor) before regulatory restrictions apply to the charge setting in the following year. We believe this would give us greater flexibility when setting charges and would help smooth the impact for shippers and customers.

These proposals can only be finalised once the price control parameters and licence arrangements are finalised. The cost of equity and gearing in this Business Plan does not currently reflect any cash flow risk associated with such proposals and this will need to be taken into account in finalising arrangements.

In addition to these proposals, which we will develop further as the price control parameters are finalised, we will continue to provide shippers with information on forecast allowed revenue and expected changes in charges on a quarterly basis for a rolling 5 year period. We will also continue to provide a summary of changes that underlie or support changes in charges e.g. RPI, consumption patterns or quantities etc.

We believe that these proposals will help to mitigate some of the key issues around charging volatility and significantly improve the predictability of our charges in GD1.

Uncertainty mechanisms

The introduction of uncertainty mechanisms also impacts upon predictability and volatility. However, their use is limited and they are flagged in our Business Plan (see previous section). While they might act against price stability, such re-openers go through a consultation process and changes in charges should be transparent so that the relevant stakeholders get sufficient early warning. We do not therefore propose to include these mechanisms in the above capping mechanism.

2.6 Stakeholder Engagement

Summary
In recognition of the RIIO principles and framework, stakeholder engagement has played a central role in the development of this Business Plan. Stakeholder engagement has helped us understand the services our customers value most; the areas where they believe there is room for improvement; the initiatives they would like us to implement; and their willingness to pay.

Throughout the development of our Business Plan we have continuously engaged with a wide and diverse range of stakeholders using different communication methods to seek their views, develop and test our proposals.

Our plan has changed following this feedback and now represents a balanced view of all stakeholder requirements while continuing to comply with our legal and regulatory obligations. It provides long term value for money and facilitates the transition to a low carbon, sustainable energy sector.

Our stakeholder engagement strategy

We have always engaged with stakeholders, but in 2010 we formed a dedicated Stakeholder Engagement Team following completion of the Ofgem-led 'RPI-X@20' review. The team is embedded in our Customer Service Directorate but works closely with all business areas.

One of the first tasks of this team was to develop a strategy that would ensure all our stakeholder activities are well planned, managed and coordinated. We want to make sure we focus on the right things and that our communications with our stakeholders are open, transparent and convenient for our stakeholders. Our network covers a wide and diverse geographical area; similarly we have a wide and diverse network of stakeholders and our strategy takes this into account.

Our Stakeholder Engagement Strategy is to proactively engage with all our stakeholders on an ongoing basis to:

- inform the development of our Business Plans;
- continuously test our views, assumptions and performance; and
- ensure our plans and activities remain aligned to our customers' and other stakeholders' needs and provide long term value for money.

In developing and applying this strategy we have adopted the following principles:

Inclusive – We aim to identify and engage with all stakeholders, seeking their views, developing ideas, exploring alternatives and establishing priorities.

Targeted – Where appropriate we target stakeholders with relevant knowledge and expertise to maximise input and the efficiency of the process.

Open and Transparent - We want all our engagement to be open and transparent. We will not prejudge outcomes. We ask open questions and encourage discussion.

Informed – To improve the efficiency of the process and allow stakeholders to form their own views and contribute to discussions we provide them with the information they need.

Accessible – Acting on stakeholder feedback, we will engage with stakeholders in a way that suits them. We will use various forms of communication e.g. questionnaires, focus groups, bilateral meetings, consultations etc. The form of engagement will be tailored to suit the stakeholder group and subject matter.

By recognising stakeholder engagement as a distinct and measurable activity and by setting a strategy that all our staff understand and can follow we have raised its profile across our business. Stakeholder engagement is now embedded in the way we think and the way we work. We are now more focused on meeting stakeholders' needs.

Our stakeholder engagement programme for developing our Business Plan

Applying the principles set out in our strategy, we developed a programme of events that ran from August 2010 to the beginning of October 2011. These events and the feedback received have been instrumental in shaping this Business Plan for RIIO-GD1.

Throughout the process we involved external parties where appropriate e.g. to advise on the planning and structure of events to ensure they were as inclusive and productive as possible; to facilitate events and help stimulate discussion; or to run events to ensure the views obtained were representative, accurately portrayed and completely impartial e.g. our customer focus groups.

The stakeholder engagement programme for the development of this Business Plan was split into three phases: Phase 1 and 2 covered a wide range of stakeholders and topics but at a high level. Phase 3 drilled down in to more detail with smaller events and more targeted stakeholder groups. Phase 1 and 2 of our programme helped set the framework of our stakeholder programme and Business Plan e.g. the priorities and policy objectives. The detail was developed in Phase 3. A summary of the 3 phases is set out below.

Phase 1 – Preliminary Consultation

Our stakeholder engagement programme commenced with our Preliminary Consultation in August and September 2010. This was posted on our website and issued to a broad cross section of approximately 800 stakeholders including local authorities, housing associations, contractors, trade unions, emergency services, Consumer Focus, the Energy Ombudsman, gas shippers, suppliers etc. The questionnaire sought views on:

- who we should consult throughout our engagement programme,
- how we should engage with our stakeholders,
- areas of our business in which stakeholders had an interest and
- priorities.

We were pleased that 43 individuals and organisations took the trouble to respond to the consultation. Results were analysed and used to develop our stakeholder engagement plan for Phase 2 and our overall stakeholder engagement strategy.

Phase 2

Phase 2 involved a number of events and covered a wide range of stakeholders and business areas. Our flagship event was our 'Stakeholder Live' event held in London in February 2011. The event was well attended by a diverse range of interest groups and resulted in productive and in some cases quite detailed discussion on the main areas of our business:

- safety and reliability of our networks
- sustainable networks
- customer, community and social responsibilities.

The 'Stakeholder Live' event was instrumental in shaping our Business Plan for GD1. It helped us better understand stakeholders' views, develop proposals, test alternatives and identify areas where further engagement, analysis or development was required.

Following on from the 'Stakeholder Live' event a number of events were organised for specific stakeholder groups e.g. end customers, gas shippers, local authorities, developers, government, the Health and Safety Executive. These events allowed us explore stakeholders' views in more detail and develop our Business Plan. Events such as our customer focus groups were run by independent facilitators (Accent) to ensure open and frank discussion and a good cross section of social, economic and age groups were involved. They tested 'real' customers' priorities, views on our proposals, alternatives and willingness to pay.

Phase 3

Phase 3 of the Stakeholder Engagement Programme was heavily influenced by Phase 2. Feedback from Phase 2 was analysed to identify areas where more focused engagement was required to explore views, address gaps, further develop and test our plan. Events were more focused on individual issues with specific and smaller stakeholder groups e.g. bilateral meetings. This phase of engagement tended to be led by each business area.

There were numerous events involving contractors, service providers, suppliers, gas shippers, trade associations, customer representatives, local authorities, developers and end customers.

Phase 3 also included some staff engagement sessions to test and refine our proposals and explore opportunities for innovation.

Form of Engagement

Throughout our programme we have continually made use of the internet, keeping our website updated with details of events and developments. We have invited all stakeholders to participate in discussions or post views at any point in time. We have also used questionnaires and consultations to ensure our stakeholders who couldn't attend our live event, focus groups, seminars or meetings were still able to see how our proposals were developing and contribute.

Our programme for delivering what we believe is a 'well justified' Business Plan culminated with our consultation on our proposed Business Plan in September 2011. The document was written to ensure all stakeholders would be able to participate in the consultation process and we were pleased that 13 individual organisations took the time to respond. Responses were received from transport bodies, councils, gas shippers, an environment agency, energy agencies and charities and contractors. Respondents were generally in agreement with "our priority areas and values" and did not raise any objections to our proposals but some said they would like more detail, particularly in relation to our mains replacement programme, the increased funding required for our emergency service and the increased funding required for asset integrity. We have taken comments received into account in finalising this Business Plan.

Output and future plans for stakeholder engagement

We are extremely encouraged by the level of interest received in all our events and the level of involvement from all our stakeholders. We have received some very valuable contributions and we thank all our stakeholders for their time and participation. The relationships we have established and the lessons we have learned have been invaluable and we will build on them in our ongoing stakeholder engagement programme.

The detailed feedback we have received has shaped this Business Plan and can be found embedded in each chapter. It is frequently referred to in order to explain and justify our proposals.

We believe our plan reflects stakeholder views and delivers the service they value while ensuring long term value for money but we know this is just the start. We plan to build on this and develop a robust stakeholder engagement programme for the future.

Further details on stakeholder engagement and our strategy for providing excellent customer service, including our proposal to produce a Report Card, can be found in Chapter 5 and in Appendices D and E. With regard to customer service, Chapters 5 and 10 also address the issue of different levels of customer expectations in different regions, particularly London.

An overview of some of the key messages received from our programme to date is set out below.

Key Messages

- Our performance when we carry out our work and how efficient we are was a consistent theme across all our stakeholder events. Stakeholders who replied to our preliminary stakeholder consultation told us that our performance was the most important thing to them. In particular customers told us that it is important that we listen to them and understand their needs, keep our promises and deliver a quality service. Some felt there was scope to improve communications.
- There is overwhelming support for the mains replacement programme and maintaining the current level of expenditure. 30% of stakeholders at our London 'Live' event who completed our questionnaire stated this was a key area of interest for them. Stakeholders value safety and are keen to see current standards maintained, if not accelerated. Customers, transport bodies and local authorities were particularly interested in proposals for a zonal mains replacement programme and larger more flexible projects. They believe this will help improve planning and coordination of work, reduce disruption and improve efficiency.
- 17% of stakeholders at our London 'Live' event ranked safety as a priority. They are generally supportive of our performance in this area but are keen that we maintain standards. Customers were concerned about the risks posed by gas escapes and said this should be one of our primary focuses. There was strong support for our emergency response service and the current 97% response standards and timescales for dealing with reported emergencies. Our proposals in this area are set out in Chapter 3.4.
- A significant number of stakeholders expressed concern at the dangers of carbon monoxide (CO) and supported a role for GDNs in raising awareness. Views on other potential roles for GDNs were discussed and are raised in Chapter 5.
- Reliability of supply is also high on stakeholders' list of values. The level of interruptions experienced currently is very low and was generally praised but is now said to be taken for granted. Stakeholders expect these levels to be maintained and would not support any deterioration in this standard.
- A wide group of stakeholders believe gas will still be a key source of domestic heating in the next decade. However, they are all aware of environmental targets and concerns regarding security of supply. Stakeholders told us they believe we should be doing more to help facilitate development in this area and explore alternative sources of gas. The cost of connection and entry equipment was generally viewed by many who have experience in this area as a barrier to entry.

Ongoing Stakeholder Engagement Plan for RIIO-GD1

The relationships we have established and the lessons we have learned from the stakeholder engagement conducted to date have helped inform our plans for our ongoing stakeholder engagement programme. We plan to build on and develop the programme conducted to date with continued engagement with all stakeholders across all business areas to:

- provide an update on our progress in delivering the services that our customers value and in meeting primary and secondary output measures;
- continually assess customer expectations and priorities; and
- continuously develop our plans.

2.7 Outputs and Incentives

Two of the key planks of RIIO are outputs and incentives. We are committing to deliver on a number of primary and secondary outputs over the course of GD1:

- Emergency response: we will continue to meet the 97% attendance standard for gas incidents;
- Risk: we will reduce the risk of gas escapes from iron pipes by 38%;
- Asset health: we will improve our health and condition of our assets, ensuring they are in a good or serviceable condition as defined by Ofgem's asset health index 'HI2';
- Environment: we aim to meet or beat Ofgem's target for reducing leakage from our network; we will raise awareness of the dangers of carbon monoxide; and
- Customer service: we will reduce customer complaints by 30%; we will improve our overall customer satisfaction score to '9 out of 10'.

We will also reduce the number of 'Priority' faults by 67% by 2021, thus significantly reducing any widespread risk to the continued reliability of our gas transmission system; we expect to connect 42 biomethane plants and provide 9,000 assisted connections over the eight years.

In addition to Ofgem's incentives around the environment and customer service, and following clear stakeholder feedback, we have developed a mechanism that provides a strong incentive to raise awareness of the risk of carbon monoxide poisoning. We are also proposing to extend the discretionary reward scheme to include priority services, social obligations and non-leakage business carbon footprint initiatives.

These benefits can be delivered with no significant impact on customers' bills; the improvements we will deliver will result in an average annual increase of around 1 p per day, in real terms, for a typical household.

Proposed output measures

Ofgem has proposed a suite of output measures to ensure that GDNs deliver clear value for money during GD1. The broad output measures are as tabled below:

Policy Area	Output Measure(s)
Environment	Biomethane reporting arrangements; discretionary reward scheme (DRS) for companies that deliver environmental outputs not funded at price review; introduction of connection standards and provision of information for biomethane connections
Customer service	Broad measure of customer service made up of: customer satisfaction, complaints and stakeholder engagement
Customer connections	Guaranteed standards for existing market segments; introduction of connection standards of service for distributed gas entry customers
Safety	Introduction of a risk-removed output measure for repex programme
Reliability	Development of capacity and asset health output measures
Broad approach to asset management	Risk-based approach; licence condition to mandate the collection of data on asset health and risk to be introduced ahead of 2013

We have used these output measures as a baseline for our Business Plan. With the help of our stakeholders we have identified indicators that can be used to measure our performance in each of these policy areas, which we have aligned to our goals of acting safely, providing excellent service, being good neighbours and developing a business for the future.

Our goals and how we will measure performance

Our Goals	Output Measure(s)
Acting safely	• Reducing risk. The risk removed from our network through our asset integrity and the mains replacement programme. • Protecting the public. Our rate of response to reported gas emergencies relative to the one hour and two hour emergency standards. • Protecting our staff. The total recorded incident rate for our colleagues and contracting partners.
Providing excellent service	• Maintaining gas supplies. The number and duration of supply interruptions. • Providing timely information. Meeting our customers' expectations on the provision of information that matters to them. • Listening to our customers. Our response to customer complaints.
Being good neighbours	• Reducing our environmental impact. Volume of gas used in connection with the operation of the network or which is unaccounted for (shrinkage) against our target. • Removing assets that affect local communities. Our progress in decommissioning all gas holders and remediating land. • Assisting the fuel poor. The number of new connections of households in fuel poverty.
A business for the future	• Helping to mitigate and adapt to climate change. Our expenditure on innovation, research and development. • Keeping costs down. Through benchmarking and market testing to ensure we are at the frontier. • Training and developing our future workforce. Providing the skills and knowledge required to deliver our goals and vision.

We will produce a Report Card that will set out our performance against each of these indicators. We intend to update and publish our report card each year so our customers and other stakeholders can monitor our performance. Our proposed report card is provided in Appendix E.

Proposed incentive mechanisms

In addition to the output measures above, Ofgem has proposed a number of incentive mechanisms as part of RIIO which it believes will drive the right behaviour from GDNs as we move to a low carbon economy. The proposed incentive mechanisms are as follows:

Policy Area	Incentive mechanism
Environment	Continue with the shrinkage allowance and Environmental Emissions Incentive
Customer service	Broad measure of customer service covering three areas: customer satisfaction, complaints handling and stakeholder engagement Move to incentives based on industry historical upper quartile performance for satisfaction and complaints
Social obligations	Continuation of an amended DRS scheme; arrangements for a fuel poor network scheme

As stated earlier, we are committed to playing our part in helping to move the UK to a low carbon economy. However, we do not believe that this suite of incentive mechanisms provides enough encouragement for GDNs to innovate or change their behaviour in two critical areas.

- Firstly, carbon monoxide: our customers and other stakeholders have very clearly told us that the GDNs' role regarding carbon monoxide should be one of raising awareness. To that end we are proposing an incentive in this area; and
- Secondly, DRS: we were disappointed with Ofgem's decision to narrow the scope of the DRS and reduce the annual monetary reward. This is the opposite of what is needed, and our stakeholders agree with us. We believe that the DRS should be expanded, to include priority services, social obligations and business non-leakage carbon footprint initiatives.

We believe that incentives in these areas will drive the behaviours that our customers want, and that will help the GDNs to help in moving the UK towards a socially aware, low carbon economy. Appendix E provides further detail on these proposed incentive mechanisms.

Safety and Reliability of Our Network

Summary

Our customers and other stakeholders have told us they place a very high value on security of gas supply. In order to continue to operate a safe, secure and reliable network, we need to ensure all our assets remain fit for purpose. Our investment programme for GD1 is aimed at doing just this.

Overall our investment programme is similar to current levels but there are some significant variations across the key categories. For example, while we have been able to significantly reduce our investment for capacity due to changes in demand we intend to nearly double our investment in asset integrity due to age and obsolescence of key pieces of equipment.

Our investment plan has been compiled following extensive stakeholder consultation. It has also been subject to independent review by engineering consultants Jacobs Ltd[2]. Jacobs has fully endorsed our plan and its report can be found in our Third Party Appendices which are available on our website.

Further details of our investment plans and our stakeholder engagement are set out in this chapter and the relevant appendices as listed.

3.1 Introduction

The gas distribution networks require a safety case under the Gas Safety (Management) Regulations 1996, and are also subject to the following specific legislation:

- Pipeline Safety Regulations 1996 (PSR)
- Pressure Systems Safety Regulations 2000 (PSSR)
- Control of Major Accident Hazards Regulations 1999 (COMAH).

The condition and performance of our assets need to be maintained at a level that ensures compliance with these regulations. In order to achieve this we invest in our assets under the following major categories:

1. Asset integrity
2. Capacity
3. Replacement expenditure (see Chapter 4)
4. Emergency and repair.

We also have a licence condition to ensure our network has the capacity to deliver gas in the worst winter conditions, known as a '1 in 20' peak day.

Asset Integrity

It is essential that our network is fit for purpose. However, GD1 comes at a critical point in the life of the gas distribution network and issues such as equipment obsolescence, exposure to flood risk, non-compliance with current industry standards and ageing assets have resulted in an increased need for investment in our network to improve asset integrity.

We plan to significantly increase investment to £199m during GD1 to improve the network asset health where it is HI4 (material deterioration, intervention should be considered) to HI2 (good or serviceable condition). We will also reduce the level of telemetered faults on our network from 21.15 to 5.6 fault days per site by the end of GD1, improve offtake meter accuracy to 99.9% in the South East LDZ and 99.8% in the South LDZ and reduce PSSR (Pressure System Safety Regulations) faults per Written Schedule of Examination (WSOE) from 0.326 to 0.209.

Capacity

We have statutory, licence and commercial obligations to develop and maintain our network to meet forecast peak day demand that, taking into account historical weather, is only likely to be exceeded once in every 20 years ('1 in 20' peak day requirement). As a result of higher fuel prices, increased energy efficiency and the move toward renewable heat we have seen changes in both annual and peak day gas demand over recent years. We believe this trend will continue into GD1. We believe peak day demand will grow by less than 1% over GD1. As a result we plan to reduce our investment to £112.9m over GD1. This is a reduction of approximately 65% in annual average expenditure compared with the current price control. We believe this level of investment will allow us to continue to be able to meet the pipeline system security standard and improve network utilisation, without any deterioration in network safety or reliability and hence the service to our customers.

Emergency and Repair

We manage and operate a gas emergency response service 24 hours a day, 365 days a year. This is available free at the point of contact to all members of the public, regardless of whether they are a gas customer.

We have a licence obligation to attend a minimum of 97% uncontrolled gas emergencies within one hour and controlled gas emergencies within two hours. We have consistently exceeded this target in Southern Gas Networks, even during the last two winters where operational conditions were extremely challenging. Maintaining this standard is an absolute priority for our stakeholders and us. However, changes in the market and the roll out of smart meters from 2014 means traditional filler work will no longer be available during GD1.

[2] Jacobs' report: Review of Scotia Gas Network's Business Plans

We have identified a small amount of internal filler work and are committed to finding alternative work to utilise 11% of our FCOs' unproductive down time but in order to maintain our excellent service going forward we believe we will need to nearly double our investment over GD1 to £239m.

Other Investment

We intend to remove 89 low pressure gas storage installations, at a cost of £87.7m, in order to remove the societal, environmental and safety risks associated with these ageing assets. This is fully supported by the HSE.

We are proposing to invest £2.94m in GD1 to protect our key assets against heightened risk and security threats. This will cover the physical security of our sites and assets as well as the key information technology systems.

3.2 Asset Integrity

Summary

Asset integrity is generally defined as capital investment in operational gas infrastructure assets in response to deterioration in condition, performance or operability below what is regarded as acceptable to ensure a safe and reliable network. Investment to maintain asset integrity is carried out across the three broad areas:

- general network integrity;
- district governors; and
- offtake metering.

These asset categories make up a significant portion of our network and due to the elevated pressures they operate at failure has the potential to have a catastrophic effect on communities and the environment and is likely to result in loss of supply to a significant number of customers. Stakeholders have told us failure is not acceptable.

The new price control comes at a critical time with a significant proportion of our assets reaching the end of their design life of 40 years. In some cases there is evidence of corrosion, fatigue and deterioration. As such we have proposed a level of investment to address integrity issues for our most critical assets to improve their health and longevity.

We believe we need to significantly increase investment to £199m during GD1 to improve the health of our assets, to maintain reliability and ensure we continue to comply with existing safety requirements set out in legislation such as the Gas Safety (Management) Regulations 1996. The benefits of investment will also be measured through the Asset Health Index. Those assets with an index of HI4 (material deterioration, intervention should be considered) or above will be reduced to HI2 (good or serviceable condition) by the end of GD1. Investment will also deliver a reduction in telemetered faults on our network from 20.15 to 5.6 fault days per site by the end of GD1; improve offtake meter accuracy to 99.9% in the South East LDZ and 99.8% in the South LDZ; and reduce PSSR (Pressure System Safety Regulations) faults per Written Schedule of Examination (WSOE) from 0.326 to 0.209 by the end of GD1.

Further details of our plans can be found in Appendix G.

General Network Integrity

General network integrity includes national offtakes and entry points, Local Transmission System (LTS) pipelines, Pressure Reduction Systems (PRS), telemetry and mains and services.

Investment

We are proposing to invest £107.9m in these operational assets across the network in order to improve their condition, reliability and operability. This level of investment is required due to the age and condition of these assets. We want to ensure our network remains fit for purpose and complies with legislation.

The distribution of funding across our assets is set out in figure 1 below.

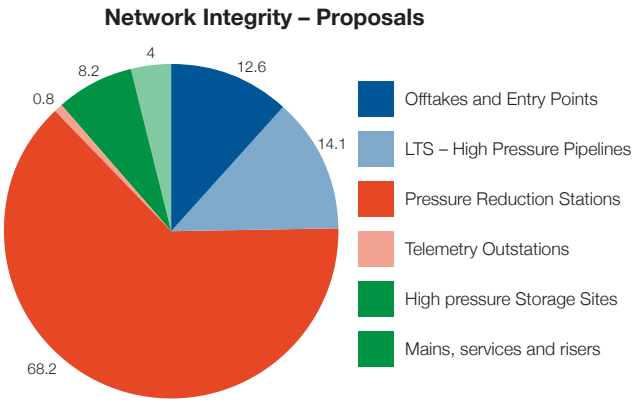


Fig. 1 – Funding for general network integrity

We intend to invest £12.6m during GD1 on offtakes and entry points, £14.1m on the LTS, £68.2m on PRSs, £4.0m on distribution mains, services and risers and £0.8m on telemetry infrastructure and £8.2m on high pressure storage systems. This funding is concentrated on assets that have the potential to generate the greatest risks to the safety of the local community and that are critical to gas supply. Further details of our investment plans can be found in Appendix G.

Output and Historical Performance

During the early part of the current price control period we had difficulties obtaining necessary easements and permissions to carry out our asset integrity programme. Staff were therefore re-directed to other activities temporarily. These issues have now been addressed and we are actively progressing all projects. We plan to build on this over GD1.

The primary output measure proposed by Ofgem to monitor our progress during GD1 relates to asset safety. Our performance will be monitored through the submission of safety reports to the HSE. Ofgem also proposed four secondary measures relating to asset health and reliability. These measures and our proposed deliverables are set out below. Our proposed investment of £107.9m on general asset integrity will:

- reduce the number of telemetry faults on offtakes and PRSs from 20.15 to 5.60 fault days per site;
- improve offtake meter accuracy to 99.9% in the South East LDZ and 99.8% in the South LDZ;
- reduce PSSR faults from 0.326 to 0.209; and
- improve the asset baseline health index of HI4 to HI2.

These benefits will be delivered by the end of GD1.

Justification and Benefits

GD1 comes at a critical point in the life of the gas distribution network. Natural gas was introduced into the UK in the late 1960s with conversion from the old manufactured (Towns) gas taking place well into the 1970s. The NTS was constructed to distribute gas to the regions and the NTS offtakes; the LTS pipelines and the PRSs situated on the distribution network allowed gas to be distributed around the regions to customers.

The systems were designed with an anticipated lifespan of 40 years. In the case of pipelines, a lifespan of 40 years was specified assuming they saw a full pressure cycle every day (i.e. 15,000 cycles). In practice most pipelines have not experienced this operating regime. However, with age other considerations have come into play. These include deterioration of coatings, increased corrosion, evidence of weld defects and a host of other factors that a responsible pipeline operator must consider when certifying the asset for continued use.

The safety of our assets is of paramount importance. High pressure pipelines have a great potential for harm if they fail or rupture; they are notified to the Health and Safety Executive as Major Accident Hazard Pipelines under the Pipeline Safety Regulations 1996. Over-pressurisation of these pipes is prevented by safety cut-off devices on the offtakes and PRSs to protect the downstream distribution system and communities.

As set out above, there is evidence that some assets are reaching the end of their operational life. There is evidence of fatigue and deterioration. Our investment programme will allow us to replace or refurbish assets as appropriate to ensure a safe and reliable gas distribution system in terms of gas containment, avoidance of over-pressurisation and loss of supply and continued compliance with legislation.

Further, detailed justification of our investment plan is provided in Appendix G: Investment to Maintain Asset Integrity.

Independent engineering consultants Jacobs Ltd has also reviewed our investment plan. Their endorsement of our plan is provided as in Annex 1 in our Third party Appendices.

Assessment of Alternatives to Investment

We have considered the option of increasing the extent of functional inspection of our assets. We already functionally inspect our offtakes and entry points and PRSs at least every 6 months. More frequent inspections would result in equipment being taken off-line during periods of high demand in winter, which could result in interruption to supply at the most critical times for our customers. We believe this would be counter-productive.

Degradation in condition of our assets is already minimised as far as practicable during our planned interventions. The current condition of our assets is primarily due to their age and this can only be resolved through more intrusive overhaul, refurbishment or replacement.

We will continue to consider innovative techniques as an alternative to replacement of assets e.g. if refurbishment rather than replacement is found to be acceptable as our understanding of asset life cycles and standards develops. However, the potential suitability of such options is not currently fully understood and not a viable option. We therefore intend to use of innovation funding to target potential solutions during GD1.

Governors

District governor installations generally regulate pressures from the intermediate pressure system into the medium and low pressure systems and from the medium pressure systems into the low pressure networks. District governors normally supply networks that provide gas to domestic and industrial and commercial customers. An industrial or commercial governor feeds single commercial or industrial customers and a service governor feeds one or two domestic properties.

Governors are safety devices that act to prevent gas at high pressure entering a downstream system. Failure of a governor will normally lead to either loss of supply or over-pressurisation of the downstream network which in turn could potentially lead to mains failures, gas escapes and gas in buildings. It is therefore important that we maintain these assets to ensure the safety and reliability of our network.

Investment

We are proposing to invest £84.3m to replace 1,095 district governors and 1,320 service governors (16.4% of overall asset volume) across our network during GD1 to address concerns regarding age and condition. The costs are based on tendered unit costs for those projects currently being progressed.

Outputs and Historical Performance

Our performance in delivering our investment programme will be monitored against the primary output measure looking at loss of supply measured through interruption data and the secondary output measure looking at improvements in asset health, measured through the health indices. We plan to deliver improvements in asset health from a baseline in 2010/11 of HI4 to HI2 by the end of GD1.

Our asset integrity work is currently prioritised using a prioritisation system detailed in our Management Procedure SGN/PM/GOV/1. This looks at some of the following factors:

- Obsolescence;
- Condition of the main components such as valves and filters;
- Whether the asset relates to a single or multi-feed supply;
- Compliance with standards and legislation;
- Safety of the public and staff;
- Danger of flood/wind damage;

Our proposals for Health Indices over GD1 are consistent with this prioritisation but in addition they will allow us to review the relevance and weighting of each issue and consider whether they relate to asset health or criticality of the asset.

Justification

The governors that we plan to replace are ageing, obsolete and not compliant with current industry standards. A recent review of maintenance frequencies in accordance with our Reliability Centred Maintenance (RCM) programme highlighted that a number of governor types and configurations are experiencing an increased rate of failure, suggesting they are 'ageing' or reaching 'terminal' performance. Replacing these assets will ensure safe gas apparatus (complying with safety standards including Dangerous Substances and Explosive Atmosphere Regulations (DSEAR)), the safety of the public, safety of our customers and safety of our staff. It will also ensure the continued reliability of gas supplies is maintained. This proposal is fully supported by key stakeholders, as discussed below.

Further detail regarding the nature of our investment programme and justification for replacement of these assets is provided in Appendix G: Investment to Maintain Asset Integrity.

Assessment of Alternatives to Asset Replacement

We have investigated the possibility of re-introducing spares for the governors but following discussions with various equipment manufacturers it is clear that they have discontinued supply and are not prepared to consider re-tooling. In some cases component drawings are no longer available. We also looked at the option of re-engineering our network but analysis indicates significant reinforcement would be necessary to maintain security of supply. Details of our assessment of alternatives are provided in Appendix G.

Offtake Metering

Natural gas is received into our network from the NTS through 11 offtakes. The primary role of the offtake is to measure the volume and composition of the gas; to reduce the pressure and to odorise the gas entering our network to ensure any escapes downstream of the offtake can be detected by smell. Annually, approximately 103 Tera-Watt hours (TWh) of energy passes through our offtakes for onward transmission through our network to customers.

Investment

We are proposing to invest £6.8m in our offtake metering systems at 8 out of 11 national offtakes. This work will comprise the replacement of ageing orifice plate metering which is no longer compliant with current metering standards; replacement of turbine meter systems which are ageing and displaying increased fault rates; and replacement of gas energy measurement devices.

The cost of the proposed programme is based on the efficient outturn costs of recently installed metering installations at sites across the Southern Gas Network area. It will deliver a marked improvement in our metering performance by the end of the GD1 period. Our investment plans are designed to deliver an overall meter accuracy rate in the South LDZ of 99.8% and South East LDZ of 99.9% by the end of GD1.

Outputs and Historical Performance

As indicated above, the primary output measure for this activity is the yearly "reporting of the percentage of incorrectly recorded throughput as a percentage of total throughput". Our recent performance against this standard has been as follows:

LDZ	Meter Accuracy		
	2008/9	2009/10	2010/11
South East	100%	100%	100%
South	100%	98.98%	99.58%

During 2010 and 2011 we implemented a number of improvements to ensure meter errors are reduced, as far as reasonably practicable. Nevertheless, some errors are inherent in ageing and non-compliant orifice plate metering systems and accuracy cannot be guaranteed to be better than 97% at present. Further improvements will only be achieved through the implementation of our proposed investment plan.

Justification and Benefits

The orifice plate systems, originally installed in the 1960s, do not comply with current metering standards and cannot meet the levels of certainty of measurement set out in the Uniform Network Code (+/-1%). These single orifice plate systems are the sole means of metering gas from the NTS into the Local Distribution Zone. These meters, particularly at the larger sites, measure very large volumes of gas of up to tens of Tera-Watt Hours costing hundreds of millions of pounds sterling.

We also intend to replace the remaining turbine meters on our offtakes. Although they are fitted on sites that transmit relatively small quantities of gas they operate on isolated networks and recent tests have highlighted increased evidence of turbine wear.

Metering errors can occur as a result of contamination within the gas stream, drift or failure of instrumentation or human error. Such errors may typically be up to 2% of the gas transported through the offtake. Recent investigations have identified that errors of less than 3% are very difficult to detect so that errors can involve significant volumes of gas with a value of up to tens of millions of pounds sterling. Our stakeholders, particularly shippers and customers, have been very clear that they expect us to be able to limit meter errors to less than 50GWh (approximately £1m). A recent error at our Braishfield B offtake resulted in an under-read of around 1TWh. The proposed replacement of 8 offtake metering systems has been fully supported by key stakeholders. It will deliver the following benefits for shippers and gas customers:

- Potential meter errors restricted to below 50GWh per annum;
- Financial shocks to both shippers and NG NTS reduced to less then £1m per annum per offtake;
- Opportunity to share condition monitoring data for ultrasonic meters (USMs) to demonstrate continued proper operation; and
- Certainty regarding metered volumes improved ensuring charges more accurately reflect the volume of gas transported and used.

Assessment of Alternatives to Investment

We considered refurbishment of our assets to meet the requirements of the current specification, BS EN 5167:2003. However, refurbishment will not improve the uncertainty of our orifice plates. Also, following a metering incident on SGN's network in Scotland at Aberdeen in 2009 we have reviewed our policies and procedures for meter validation. We have determined the refurbishment would not remove the potential for human error. Refurbishment would mean the issues of compliance and uncertainty would remain. We do not believe this is acceptable.

We also considered increasing the frequency of validation at all sites to 6 months but from analysis carried out it was evident that validations every 6 months would only limit the scale of potential errors at one offtake to below 50GWh. Elsewhere meter errors could still exceed the acceptable limit. We consulted our stakeholders and discussed the proposal to replace ageing orifice plate meters. They responded that they would support a replacement programme for the larger sites bearing in mind the greater potential for financially damaging errors. They also said this would aid the allocation of unidentified gas, improve shrinkage data and identify areas where theft of gas is an issue. For this reason we have adopted the approach to replace metering at larger sites where significant error is more likely. At other sites our plan is to increase the frequency of validations to minimize the potential for errors.

Finally, we considered remote condition monitoring for orifice plates and turbine meters but determined this is not possible as there is no independent parameter that can be used to verify meter accuracy.

Full details of our assessment of alternatives to asset replacement are provided in Appendix G.

Stakeholder Engagement for Asset Integrity

As noted we have consulted extensively on our proposed investment plans for asset integrity. Our stakeholders were surprised by the age of some of our assets but given the potential impact should the assets fail, they felt investment was the right thing to do. It is important to our stakeholders that we maintain a safe and reliable network into the future. Given the criticality many said failure was unacceptable. Our investment plan is designed to ensure the risk of failure is minimised.

We consulted a number of shippers on our offtake meter replacement programme and have listened to their views and as a result we have amended our original plan to include only the most crucial offtake meters rather than them all.
We intend to continue our stakeholder engagement throughout GD1. The proposed mid-period review will allow us to review the investment programme and assess performance against the agreed deliverables.

3.3 Capacity

Summary

Our capacity investment plan for Southern Gas Networks specifies our requirements over GD1 to deliver a safe and reliable network. Through our stakeholder engagement programme our customers and other stakeholders have told us they are generally satisfied with the reliability of our network and value this but they now take it for granted and would not support any deterioration in service.

Our plan is constructed to deliver our statutory, licence and commercial obligations to develop and maintain an efficient and economical pipeline system and to plan and develop our networks to meet the Pipeline System Security Standard (meet expected peak day demand that, taking into account weather over the last 50 years, is only likely to be exceeded once in every 20 years).

We intend to invest £112.9m over GD1 to deliver the network capacity required to meet our customers' needs. This equates to a reduction in average annual expenditure of around 65% compared with the current price control period.

This investment will enable us to continue to meet the Pipeline System Security Standard and to provide the PRS capacity required to meet local load growth.

Investment

Our investment of £112.9m during GD1 includes investment of £58.4 in the local transmission system and £54.5m in the less than 7 bar system, to ensure security of supply to our 4m customers. This represents a reduction of approximately 65% in average annual expenditure compared with the current price control period.

This investment will be used to provide new capacity where customers request it or where network utilisation is reaching or likely to exceed full capability. It will be spread across all pressure tiers as detailed above and in Appendix H: Investment to Manage Capacity.

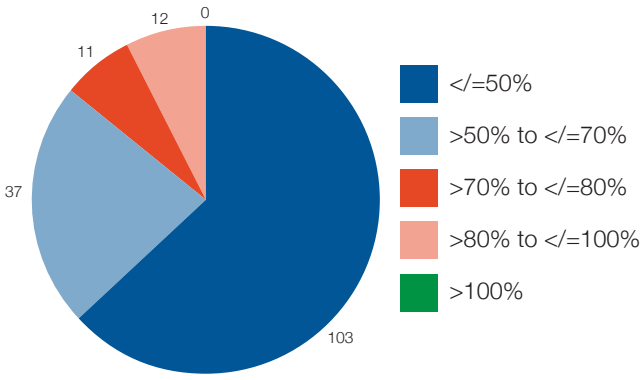
Outputs and Historical Performance

Our performance throughout GD1 will be measured through the primary capacity output measure of meeting 1 in 20 peak day demand. We have been successful in delivering against this measure in the current price control period.

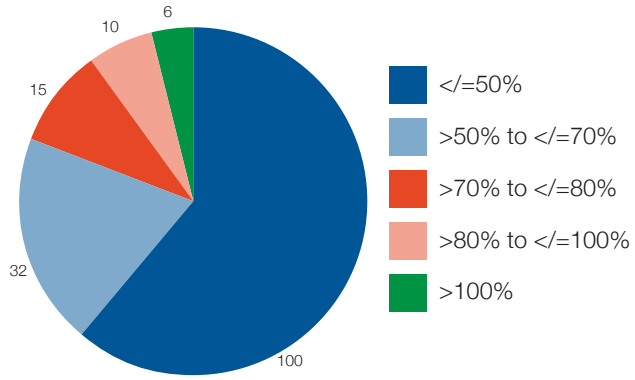
Our Business Plan also continues to utilise opportunities to balance investment in the GDN with alternative options such as offering customers interruption arrangements where it is economical or taking additional storage from the NTS. We will continue to explore these options throughout the whole of GD1.

Our utilisation of the network will also be monitored throughout GD1 using the Pressure Reduction Station (PRS) utilisation indices. The charts below show the forecast levels of utilisation of all our pressure reduction stations (sites) in the Southern Gas Networks area that have an inlet connected to the LTS. Details are based on our 2010 demand forecast but this will be updated each year. The charts show forecast utilisation at 2013 compared with forecast utilisation at 2017 and 2021 with and without investment. They show that investment is required to ensure PRSs do not exceed their capacity throughout GD1.

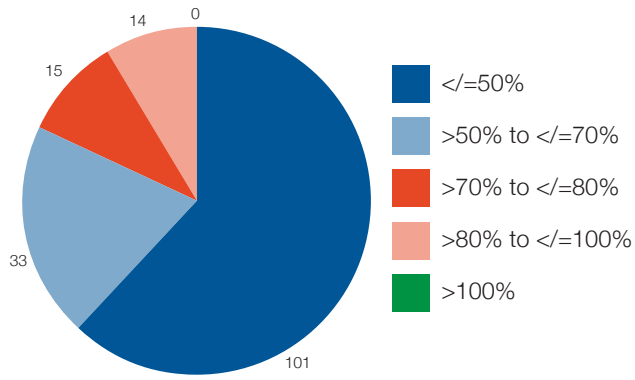
No. of sites operating at each capacity utillisation level as at 1/4/13



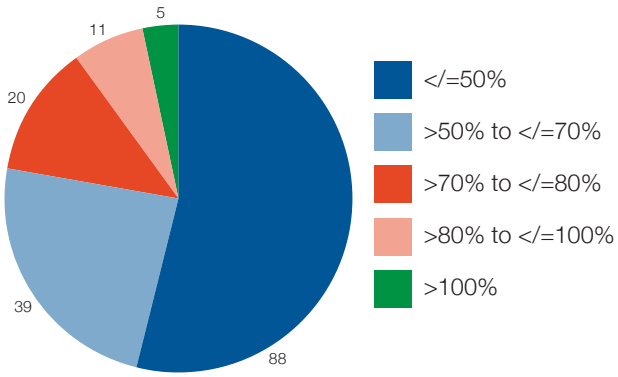
No. of sites operating at each capacity utilisation level as at 31/3/17 without network intervention



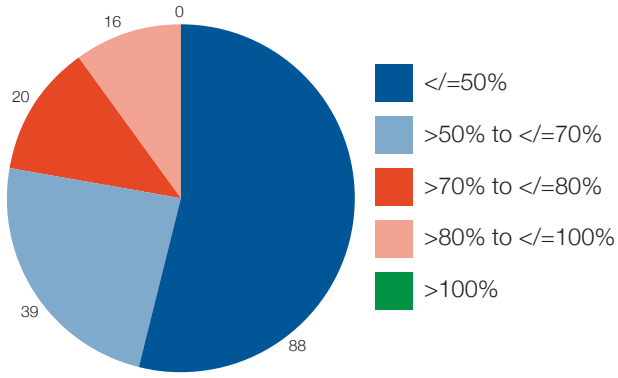
No. of sites operating at each capacity utilisation level as at 31/3/17 with network intervention



No. of sites operating at each capacity utilisation level as at 31/3/21 without network intervention



No. of sites operating at each capacity utilisation level as at 31/3/21 with network intervention



Demand Forecasting

We have an obligation to supply all customers (excluding those who have entered into interruption contracts) at demand levels that are not expected to be exceeded more than once in 20 years. This is known as the 1 in 20 Pipeline System Security Standard. In order to determine what this level of demand will be, demand forecasting is carried out on an annual basis to look at changes in the economy, government energy policy, climatic factors and customer behaviour.

Following the introduction of renewable energy policies by the UK government in 2007, to prepare for the transition to a low carbon economy, we reviewed the forecasting models used by the industry at that time, and determined that they would not be able to assess the full impact of the renewable challenge.

In 2009 we employed European industry experts TPA Solutions to build new flexible demand models and provide an independent demand forecasting service. These new models are able to incorporate the impacts of renewable heat and also provide improved visibility between demand and base modelling assumptions.

Our 2010 annual gas demand forecast performed very well when compared with the actual demand experienced during 2010/11 when weather corrected. Actual annual demands in the South and South East LDZs were 0.4% and 1.1% (respectively) higher than forecast and actual peak day demands were 1.0% and 1.6% higher than forecast. The forecast peak day demands from our latest set of demand forecasting models have been used in our planning process to determine our capacity investment requirements for GD1. As set out below, they show peak day demand is forecast to grow by less than 1% over the next 10 year period.

Further details on our demand forecasting process are set out in Appendix H.

Justification and Benefits

Our networks consist of an arrangement of pipes and other assets such as above ground PRSs which take gas from the NTS through to individual customers' premises (see Appendix A: Network Overview).

Our networks are designed to provide sufficient capacity to meet our customers' "1 in 20" peak day demands. However, they have a finite capacity and are operated to maintain a set of minimum pressures. Increased or redistributed gas usage will through time eventually erode the spare capacity. As modelled pressures indicate there is a risk they could fall below acceptable levels we will look to develop a contractual or physical solution to maintain the safety and reliability of our network.

As mentioned above we carry out demand forecasting to determine what the level of gas demand will be in the future. At the same time we also review the previous year's forecast and check this against actual peak winter demand to ensure our forecasts are built on robust simulations. Our 2011 peak day demand forecast indicates that, due to the impact of higher fuel prices driving increased energy efficiency and the move towards renewable heat, as set out in the Government's renewable heat policy, peak day demand will grow less than 1% over the next 10 year period. In demand modelling terms this means forecast future demand is relatively flat. Our current forecast shows that gas demand will increase slightly in the early years of GD1 and then reduce in the later years.

The investment outlined within this chapter of the Business Plan is aimed at ensuring we can meet this level of demand and maintain security of supply during peak demand conditions. This is essential to maintain the safety and reliability of our network.

Following consultation with council planning departments, developers and other stakeholders, we believe this investment is also necessary to facilitate local development plans and economic development in the Southern Gas Network area. Local development plans have also influenced our mains replacement, connection, diversion and asset integrity plans.

Our investments will help facilitate the wealth, prosperity and general economic well being of the communities we serve. This benefits existing and future customers and demonstrates our commitment to all our stakeholders.

Assessment of Alternatives to Investment

In developing this Business Plan consideration has been given to a number of alternative strategies that could impact on planned expenditure. One alternative to reinforcing networks is to consider elevating operating pressures. However, each network has defined Maximum Operating Pressures and in the vast majority of cases safety considerations prevent us from breaching these limits.

Following the introduction of interruption reform during the current price control period, a further alternative is to procure increased interruption via the annual interruption tender process. This would allow us to defer reinforcement for the duration of the contract. While this has not been a viable option to date, we will continue to pursue this option under GD1 but at present we believe our current investment proposals represent a more certain and robust base case. Further details of our assessment of alternatives to capacity investment are provided in Appendix H.

Uncertainties

In our assessment of future growth in the network the uncertainties in relation to the economic climate and the development of renewable energy were modelled to show the impact on demand out to 2031. The analysis is shown in more detail in Appendix H.

Stakeholder Engagement

We have sought our stakeholders' views as we have developed this plan. Their views have helped shape our investment proposals. Our stakeholders have told us they value the current safety and reliability of our network and would not accept any deterioration in service. Indeed one respondent to our recent September 2011 consultation specifically asked us to confirm the reduction in expenditure planned for GD1 would not have a detrimental impact on our service. We can confirm this is the case.

One stakeholder has pointed to the deaths that have occurred as a result of recent harsh winters and said they were concerned at the potential impact for domestic customers and other critical services such as hospitals and industry should the gas network fail at critical times, such as peak demand. At one event a stakeholder referred to recent events in Northern Ireland where the water network failed during the winter and raised concerns that if the same happened in gas, this would likely result in deaths. Support for investment in capacity was unanimous at the SGBI workshop in May 2011.

3.4 Emergency and Repair

Summary

The provision of a safe and reliable gas network for all of our stakeholders including customers, employees and the general public is our primary objective. At the heart of this is the provision of an emergency response service that operates 24 hours a day, 365 days a year.

We have consistently exceeded our licence obligation to respond to 97% of uncontrolled gas emergencies within 1 hour and controlled gas emergencies within 2 hours, even in the most challenging conditions over the last two winters.

However, demand for our emergency response service varies considerably within day and throughout the year. Currently all GDNs are incentivised to seek 'filler work' for our highly trained 'first call operatives' (FCOs) during down time. Changes in the market, including the proposed roll out of smart meters, means that traditional filler work will no longer be available during GD1 to the same extent as during the current price control period. We have identified a small amount of internal filler work and are committed to finding alternative work to utilise 11% of our FCOs' unproductive down time but in order to maintain our excellent service going forward we will need to be funded to at least 95%.

We believe we need to double our investment over GD1 to £239m to ensure we are able to provide an efficient and effective emergency response service and are able to continue to meet our licence obligation regarding emergency response times. This will also ensure we are able to provide the service our stakeholders and customers have told us they value and have come to expect.

Further details of our proposals can be found in Appendix J.

Introduction

We manage and operate a gas emergency response service that operates 24 hours a day 365 days a year. It provides an essential service to all members of the public, free at the point of delivery, regardless of whether they are a gas customer or not. This ensures the safety of all our stakeholders and the integrity of the network are maintained at all times. This is achieved across the whole of our network area in all conditions.

Since Southern Gas Networks was formed in 2005 we have consistently delivered a high standard in our 'first call' emergency service, exceeding the 97% target for controlled and uncontrolled calls each year (See figure 1 below). Our success in delivering these standards and our commitment to our customers' needs is further demonstrated by the determination with which we have provided these services during the most challenging operating conditions over the last two winters. The primary feedback from our customers and other stakeholders has been to confirm they value this service and now liken it to any other emergency service. Their expectation is that this standard should be maintained throughout GD1. This gives us a clear target and determines the resources we will require during the forthcoming price control period (GD1).

	Response to uncontrolled gas emergencies		Response to controlled gas emergencies	
	2009/10	2010/11	2009/10	2010/11
Southern Gas Networks	98.43%	97.08%	99.31%	98.72%

Figure 1: Southern Gas Networks performance against the emergency response standard

Investment

Continued delivery of our emergency standards is predicated on the availability of sufficient skilled and experienced FCOs across our network area. We have therefore put together an investment package which delivers a continued efficient and effective service. This is achieved by balancing the need for sufficient skilled resources against the reduction in the scope and scale of alternative work during off peak periods, while maintaining value for money for our customers.

In order to maintain an efficient and effective emergency response service that is able to cope with peak demand, we need to invest £239m in people, processes and practices during GD1. Details of how this investment programme is built up and the potential for a limited amount of internal filler to fund up to 11% of unproductive down time are provided in Appendix J.

Output Measure and Performance

Our performance in delivering our emergency service will be measured against a primary output measure that will remain as the current standard set out in our licence. That is:

- Uncontrolled Gas Emergencies: attend a minimum of 97% within one hour; and
- Controlled Gas Emergencies: attend a minimum of 97% within two hours.

Given the experience of the last two winters, even though we continued to meet the above standards, we faced extreme operating conditions that could have jeopardised our performance and potentially put us in breach of our licence obligations. We do not believe this is appropriate. We believe a 'force majeure' clause should be introduced to the GDN licence. It is not the intention to allow responsible operators to avoid delivery of the standard; rather it is to ensure that when extreme conditions do prevail there is some flexibility around the current absolute target.

Determination of appropriate events to be covered by 'force majeure' should be agreed between Ofgem and the GDNs. Following initial stakeholder engagement we believe such a clause should include prolonged extensive road closures as experienced during the last two winters, extreme temperatures that impact on operation of our vehicles and equipment and the impact of epidemics such as Foot and Mouth.

Reporting of performance across all calls received would continue. However, additional performance levels achieved excluding 'force majeure' events would be used to determine whether a GDN had failed to meet its primary output measures.

Justification and Benefits

As a responsible gas operator we recognise we must seek to reduce the level of cost passed on to our customers. Knowing the changes that were emerging in metering, particularly with the roll out of smart metering, we have sought to maximise the potential alternative outlets for seasonal downtime within our business. We have retrained FCOs in suitable replacement activities e.g. to complete periodic surveys and data checks but these opportunities are limited to our ability to cross train staff, keep competencies up to date, and manage flexible working patterns and rotas to still provide the level of emergency response service required. We believe we will be able to utilise the labour downtime on some internal productive work during GD1 and have set ourselves a target by 2015 to achieve a 5% reduction in the base cost of providing our emergency service. This saving is reflected in the investment figure set out above. We believe this level of investment is required to meet our licence obligations and provide the service our customers have told us they expect, while also continuing to remain at the efficiency frontier, as we have achieved over the three years to 2010/11.

Alternatives to the proposed investment

We had previously considered an incentive mechanism to complement funding of the emergency service provision. Our proposal would ensure good performance above the 97% standard is rewarded whilst maintaining the penalty for under-performance. Our proposal meant that achieving

a 100% response rate would attract theoretical maximum additional revenue of 3% of allowed revenue. We discussed this proposal with a range of stakeholders. Some indicated there was value attached to outperforming this key safety standard. However, Ofgem and other GDNs were not supportive of this proposal and we have not progressed it at this point in time.

Stakeholder Engagement

In proposing retention of the existing outputs (albeit with the introduction of a 'force majeure' clause) we have sought to ensure the value attached by our stakeholders is reflected in the targets set.

We have sought the views of our customers and other stakeholders through a series of events, particularly our customer focus groups. In summary our customers told us they "want a response as quickly as possible" but all in all the current service is "reasonable". Customers who attended our Southampton customer focus group said "It's very good value for money". Feedback from other events such as our SBGI workshop in May 2011 indicated they were keen that we leave the standard as it is. They said we should not look to reduce or relax the target; it was a primary health and safety issue. However, feedback from our stakeholder "Live Event" also suggested some customers expected some form of 'force majeure' provision to already exist. They said they were surprised a "severe weather" exemption didn't already exist. Others questioned whether all networks should have the same target as extreme weather may be more likely in some areas than others. As a result of this feedback we have developed our proposals for a 'force majeure' provision.

Repair

Summary

We discharge our responsibility for ensuring the safety of all of those who use or come into contact with our gas network through the repair and remediation of escapes.

We intend to spend £202.3m during GD1 to ensure continuation of our repair service and maintenance of the existing standards in terms of risk management, timely process and quality to fulfil our obligations under the Gas Safety (Management) Regulations 1996 (GS(M)R). This is in line with expenditure under the current price control.

This investment will enable us to maintain our current high level of safety performance and maintain upper quartile performance in terms of efficiency cost assessment. This will be measured through the residual repair risk score and the percentage prevention of gas escapes within 12 hours. Our residual risk score for 2010/11 was 24.835. We plan to maintain this level throughout GD1. We also held second place relative to other GDNs in 2010/11 in relation to the percentage of reported escapes prevented within 12 hours. We plan to maintain this performance throughout GD1 delivering a score of 60%.

Further details of our proposals can be found in Appendix J.

Introduction

Our repair activities ensure continuity of supply, safe operation of our assets and control of emissions into the atmosphere. Our knowledge of the gas distribution network demonstrates that the current level of degradation experienced across iron mains (3-4%) will exceed the benefits delivered through our replacement programme during GD1 (for details see section 3.4). For this reason we are forecasting an increase in repair activity.

Investment

Despite more challenging conditions in GD1, we believe our current performance and continued efficiency will enable us to discharge our obligations in respect of safety without the need for further investment. We believe our planned investment of £202.3m strikes the difficult balance between protecting our customers and stakeholders and delivering value for money.

Output and Historical Performance

Over time gas networks constructed of iron and steel mains and associated services gradually degrade. Through a combination of soil conditions, weather, adjacent construction work, ground movement and other factors mains and service pipe assets can develop emission points through which gas can escape. As noted above, we respond to all reported escapes within tight timescales. Once on site we ascertain the likely cause and take action to protect persons and property through isolation and evacuation. Once the situation is made safe, the process of locating the source of the emissions and repairing the asset can commence.

Given the size and makeup of our geographical network area, the impact of each escape can differ widely. We have therefore developed and operate an independently verified risk assessment criteria by which we can identify conditions and situations which pose the most immediate risk to the public. We target our repair process on this basis, ensuring situations which require immediate action are addressed and low impact repairs are replanned or reprogrammed (depending on highway constraints).

The primary output measure proposed by Ofgem for GD1 for repairs is the cumulative residual risk at the end of each working day over a twelve month period. This is the risk as scored currently using our 'Gas Escape Risk Assessment Matrix Tables' from SGN/PM/EM/71: Management Procedure for Dealing with Gas Escapes and Other Emergencies. We have performed well under the current price control and plan to continue to deliver this level of service throughout GD1. Output levels have been set across GD1 to maintain the level achieved during 2010/11 of 24.835.

The proposed secondary measure covers the time taken to effect a repair. This will capture the percentage of total repairs completed within a 12 hour period following identification. The target level for this output is based on maintaining the average performance achieved during 2009/10 and 2010/11 i.e. 60% (see figure 2 opposite).

	2008/09	2009/10	2010/11	2013/14	2016/17	2020/21
Residual Risk	n/a	n/a	24.835	24.835	24.835	24.835
12hr % Standard	53%	54%	62%	60%	60%	60%

Figure 2; Percentage gas escapes prevented within 12 hours

As set out in Appendix J, we have consistently outperformed against this measure in the current price control period coming first relative to other GDNs and we plan to maintain this position.

Justification and Benefits

Through the introduction of our repair risk monitor and the excellent standards achieved in remediation repairs within 12 hours we believe we will be able to ensure any upward pressure on repair activity is limited and there is no increase in residual risk. We will continue to deliver the level of safety and reliability our customers and other stakeholders have told us they expect.

Stakeholder Engagement

Undertaking repairs on mains and service pipe assets provides a range of benefits to stakeholders in general and our customers in particular. We have sought the views of a range of our stakeholders throughout our engagement programme on emergency response and repair. As set out under the emergency response section above, it is clear our stakeholders expect us to continue to provide a safe and secure gas service. They also welcome efforts to minimise disruption repair works pose for communities, transport and commerce.

3.5 Gas Holder Removal

Summary

Low pressure gas holders were built to provide additional storage capacity to help meet the needs of our customers during high demand periods. However, many of these assets were built in the 19th Century and are now reaching the end of their useful life. The technology is no longer efficient and there is strong evidence of deterioration. These assets pose an enhanced safety risk.

This Business Plan sets out our proposals to invest £87.7m to undertake a programme of work to decommission and demolish all 89 low pressure gas holders located on the Southern Gas Network by the end of GD1 and remove the environmental and safety risk associated with these assets. This work will be carried out with no detriment to the security of supply.

This programme of work has been well received by our customers and other stakeholders. In particular it is fully supported by the HSE.

Further details of our plans can be found below and in Appendix K.

Investment

During RIIO-GD1 we intend to decommission and demolish all our gas holder stock at a cost of £87.7m. The completion of this programme enables us to remove both the societal, environmental and safety risks associated with these ageing assets and remove restrictive land use planning. The removal of holders is supported by the HSE.

The removal of these gas holders will also provide additional benefits through the avoidance of £102.32m in special operational and repair expenditure that we forecast would otherwise be required during GD1. It is likely that further incremental costs would also be avoided in GD2.

Outputs and Historical Performance

Our strategy for gas holders will be captured through the primary output measure of Safety and Reliability of the network. By decommissioning and removing these ageing assets and replacing them with more efficient and effective alternatives, we will ensure a safer network and enhanced security of supply. The removal of holders will be reflected in our asset register and hence Asset Health Indices, reducing the associated risks.

Justification and Benefits

Low pressure gas holders provide storage during the winter months to help meet customers' needs during peak demand period in the morning and evening. Many of these holders were built in the 1800s and although regularly inspected and maintained in a safe state, they are reaching the end of their useful life. The costs associated with maintaining these ageing pieces of plant are high, due to difficulties of sourcing replacement equipment, much of which is now obsolete. Currently we observe the deterioration of holders and associated systems such that the population of operational holders is decreasing steadily over time. Without our programme these structures will remain in place and will need to be inspected and maintained through GD1 and beyond.

Five high and low pressure gas holder sites on the Southern network (Gillingham, Isle of Grain, Reading, Kennington and Croydon) fall into the highest tier of the Control of Major Accident Hazards Regulations (COMAH). Holders present a risk to the local community and also impact on the local environment by restricting development adjacent to the holder site. An explosion at the Buncefield oil storage depot in Hemel Hempstead in 2005 highlights the risks associated with the storage of hazardous substances close to communities. Although thankfully there were no fatalities, approximately 40 people were injured and the resulting fire lasted 5 days. While gas holders do not pose the same cataclysmic risks, they are of pre-Victorian design; they have limited means of gas containment (a cup and grip water seal) and rely on a simple mechanical overfill protection. As such, they represent a potential risk to the public.

Currently a combination of high pressure storage bullets and buried pipe array; low pressure holders; LTS linepack; and NTS storage is utilised in balancing the daily demand profiles to meet peak demand. Going forward NTS storage will continue to be utilised along with other forms of internal storage such as LTS Linepack and high pressure storage (HPS) bullets. Increased capacity bookings have already been secured with NG NTS for GD1. As such our proposals will not have any detrimental impact on our customers and more specifically security of supply.

The HSE's view on holders is clear from a number of stakeholder engagement events: the requirement to have large volumes of stored energy in densely populated areas, where safer alternatives are available, increases the risks from both a safety and environmental point of view. Their removal goes some way towards mitigating these risks and makes for a safer and more reliable network. Our proposed investment programme enables us to remove the societal, environmental and safety risks associated with these ageing assets.

Dismantling all holder sites would also provide the surrounding areas with potential development land, thus stimulating economic growth in the construction industry and the associated positive effect this would have to the local economy. In addition secondary planning activities can be progressed more easily, once the holder has been removed.

Assessment of Alternatives to Investment

In developing our proposal we considered a number of alternative options to ensure the optimum solution was selected for our gas holders. These took the form of the following:

- Decommission and Dismantling – structured programme to decommission and dismantle all holders throughout the RIIO-GD1 period;
- Retaining Current Operational Holders – structured programme to retain all operational holders throughout the RIIO-GD1 period;
- Mothballing - structured programme to isolate all holder stock from the network during the RIIO-GD1 period.

The first option "Decommissioning and Dismantling" was not only the most economic option for current and future customers; it also removed the societal and environmental risks posed by these ageing assets.

Stakeholder Engagement

Our initial stakeholder engagement events were well attended with a wide representation of stakeholder organisations. We have also undertaken a number of more targeted events to understand stakeholder concerns in more detail. Throughout all our events on gas holder removal there was strong support for our proposal to remove holders. Positive feedback was received from our Live Event in London, our customer focus groups, local authority questionnaire and SBGI event. Although a small minority thought they were part of history and were familiar landmarks, virtually all suggested they were "unsightly" and presented an unnecessary safety risk. A number of customers who attended our customer focus group said they wouldn't like to live close to one. Also some stakeholders, particularly local authorities, suggested their removal would improve the quality of these sites and "make a significant different to land available for re-development'.

In a letter from the HSE in July 2011 they stated the "HSE is keen to encourage the removal of water-sealed gas holders from the network. These holders are ageing, so present an increasingly expensive asset to maintain. Gas releases from holders represent a safety risk, an environmental risk and a cash loss. Many holders in urban areas present a block to urban development."

3.6 Network Security

Summary
Network security is a primary consideration in delivering a safe and reliable network. It covers the physical security of our sites and assets as well as the key information technology systems, such as SCADA and Emergency Dispatch.

We are proposing to invest £2.94m in GD1 in Southern Gas Networks to protect our key assets against heightened risk and security threats.

This investment is required to support existing security arrangements, to deliver a number of new security projects at our Pressure Reduction Stations and to enhance our information technology systems.

Background

Scotia Gas Networks operates a centrally managed Security Bureau that is open 24 hours a day, 365 days a year. This is operated within our Asset Protection Department. It receives and responds to all company security or intruder alarms throughout the Scotland and Southern Gas Network areas. The Security Bureau is an approved gold standard Alarm Receiving Centre (ARC) (awarded by the Association of Chief Police Officers National Security Inspectorate (ACPO NSI)). It handles all reports of site security breaches or any other related issues.

While it is impossible to defend completely against all risks and threats we ensure appropriate security measures are assessed and implemented across the whole business. The issue of security falls into three main areas, these being security considerations for the protection of core installations, facilities and assets and information technology systems.

Equally important and crossing all of the above categories is embedding a culture of security within our organisation. This culture is driven by formulating and applying measured security policies, processes and procedures that are commensurate with the perceived level of risk and threat. SGN/PM/SAP/02 is our Management Procedure for Asset Protection and sets out arrangements to ensure a safe and secure working environment to protect company personnel, assets and operations against foreseeable risks from criminal activities or other security threats. Application of this policy allows the implementation of proportionate site risk control measures and effective resource management, through site specific reviews to identify and categorise all company sites.

Site Categorisation	Priority
Category – A.1	Critical
Category – A.2	High
Category – B	Medium
Category – C	Low

Each assessment involves the examination of the site, likelihood of and susceptibility to external interference and the potential impact on the network of such interference. This process also takes into account intelligence received and historical site experience.

A “Site Security Database” is held, administered and coordinated by our asset protection department. We utilise the site categorisation information held to manage our programme of site inspections that assess specific site issues and recommend any new identified measures. The effectiveness of the management and implementation of the inspection programme will be in line with the company’s Process Engineering Performance Safety Indicator (PEPSI) monitoring process.

Site inspections for any A1 site e.g. national offtakes, Pressure Reducing Stations (PRS), and any high occupancy sites will be undertaken at least once per year. Generally A2, B and C sites would not normally require specific security inspections, as security issues would be highlighted by our operational maintenance inspection regimes.

Investment

We intend to invest £2.94m over GD1 to support the continued delivery of our existing essential security arrangements as described below; to upgrade and enhance 29 sites to meet the specifications set out in our management procedure; and to enhance IT systems.

The work we plan to undertake to support existing security arrangements includes:

- Site/building security surveys and inspections
- Loss/damage of assets reporting and investigation
- Criminal investigations
- Police/government/CPNI and counter terrorist security advisor liaison
- Advising on terrorist threat levels and company precautions
- Bomb threat procedure
- Security training
- Production and maintenance of security procedures
- Production and maintenance of authorised persons list
- Analysis and reporting of asset theft and losses
- Supply of contracted manned guarding by Security Industry Authority (SIA) security officers

Our investment plan set out above includes £1.74m to upgrade and enhance 29 sites to meet the specifications within SGN/PM/SAP/02[3]. These sites have been selected on the basis of a site specific security risk assessment that considers the consequences to loss of supply and safety of adjacent landowners and the public. The sites have been selected on the basis that a significant security incursion could either result in the loss of supply to greater than 50,000 customers or create a major off-site safety event.

[3] Management procedure for Asset Protection.

In addition, we have been liaising with the Centre for the Protection of National Infrastructure (CPNI) regarding additional security measures at 6 sites that are classified as category 3.

Critical National Infrastructure

Level	Criteria	Threat
3	> 250,000 customers affected for > 28 days	Substantial
4	>1 million customers affected for > 28 days	Severe
5	> 20% of national demand affected for > 24 hours	Catastrophic

These sites have been sponsored for security upgrade by the Department of Energy and Climate Change. The forecast cost is approximately £1.4m per site. This expenditure has not been included in this Business Plan as these projects are being progressed separately with DECC and Ofgem. Work will commence during this price control period and is anticipated to be completed in the early part of GD1.

Information Security

We view our information systems as a key asset to support the safe and reliable operation of our network. Our policy is to manage information securely and protect it in a cost effective and proportionate manner from deliberate, unintentional or unauthorised access, modification, destruction or disclosure.

Information security is becoming increasingly important both nationally and internationally. Recent high profile and malicious attacks have proven the need for all companies to increase the level of investment and focus within this area. Recent attacks on UK utility companies in 2010 have highlighted the need for gas networks to increase their capabilities and investment within this area. We will continue to view the protection of our information as a critical function which must be managed across the spectrum of potential information security risks; from casual external malware or insider error to persistent and determined external adversary attacks.

In addition to this, the recent migration of system control functions from National Grid to us, has also transferred the associated information security risks and costs. We are therefore keen to ensure this aspect of the UK's Critical National Infrastructure is suitably protected. This we will achieve throughout the next price control period by applying the correct levels of network and data segregation, as well as providing secure management and maintenance of this critical part of our IT estate.

Justification and Benefits

In today's environment we are aware of the ongoing and indeed heightened threats to our physical assets and our information technology systems and have to continually review and update our preventative measures to protect our assets.

External threats to organisations such as ours will constantly evolve and it is therefore imperative that all security measures should be kept under constant review.

For most of our physical assets a sensible mix of good housekeeping alongside appropriate investments in CCTV, intruder alarms and lighting that deters as well as detects threats can be employed to address security concerns. The investment proposed will allow us to ensure our assets are afforded an appropriate level of protection within the environment we are required to operate.

Cyber-crime, whether relating to theft, hacking or denial of service to vital systems, has become a fact of life. Effective proportionate security can help control and secure information from malicious changes and deletions or from unauthorised disclosure. Our proposed investment will allow us to ensure our protection systems keep pace with the threat posed to our business by all types of information security threats.

Stakeholder Engagement

We have consulted relevant security experts, local police and CPNI, whose views have been integral to the formulation of our plans. We will continue to consult these parties throughout GD1 to ensure our plans and strategy remain fit for purpose throughout the next price control period.

4

Pipe Risk Management Strategy

Summary

We will invest £1,514 million in GD1 to ensure that we operate and maintain a safe and reliable gas distribution network that complies with the Pipeline Safety Regulations 1996, while embracing the innovation principles within the RIIO framework for the Iron Mains Risk Reduction programme, and other associated pipe assets. This will deliver an iron risk reduction of 38% and mitigate the risks presented by other deteriorating steel pipes over the GD1 period.

4.1 Introduction

This plan sets out our investment requirements to deliver a range of pipe risk management activities from the Iron Mains Risk Reduction programme to deteriorating steel mains and steel gas risers in multi-occupancy premises.

Investment is driven by a programme of distribution mains and service pipe risk management activities, predominantly decommissioning, that are undertaken as part of our strategy to provide a safe and reliable gas network for our customers.

The need for continued investment, targeted at the right pipes, having undertaken a suitable risk based assessment, is evidenced by our performance during the last severe winter period where our 97% emergency licence conditions were achieved whilst having to operate in extreme weather conditions.

The fact that our network remained effective, with continuity of supply to our 4.0 million customers, was in part down to the strong risk management processes we have in place and a clear ethos in our company to 'do the right thing' when balancing risk and investment across our network.

We are proud that a six day inspection undertaken by the HSE in February 2011 found our end to end pipe risk management process to be "entirely fit for purpose and a clear demonstration was made that the management of mains replacement within SGN complies with the requirements of Regulation 13a of the Pipelines Safety Regulations."

Pipe risk management is primarily driven by gas safety legislation. Under Health, Safety and Environmental legislation, we have statutory duties for:

- Complying with HSE iron mains enforcement policy
- Maintaining the pipe network in an efficient state, in efficient working order and in good repair;
- Safety and integrity of the physical pipe network;
- Safety of the public and our employees;
- Protection of the environment; and
- Security and reliability of gas supplies to our customers

We have a primary duty to ensure that our pipeline systems are designed and operated in order to ensure security and reliability of supply to all of our 4.0 million customers during the most severe of winter conditions when gas demands typically reach peak levels. This was clearly demonstrated during the 2010/11 severe winter period where making the right investments in our replacement programme has ensured a safe and reliable network. The importance of this was highlighted at our 'Stakeholder Live' event in February 2011.

"We don't really appreciate the importance of any particular utility until we are suffering without it, and then the whole world seems to stop, so there is a high premium to be paid to ensure that the reliability is maintained".

The primary legislative framework encompassing pipe risk management activities are:

- Health and Safety at Work Act 1974;
- Gas Act 1986, etc;
- Gas Safety (Management) Regulations 1996;
- Pipeline Safety Regulations (1996);
- Pipeline Safety (Amendment) Regulations (2003); and
- Environmental Protection Act 1990

The way in which we operate our business is defined in our Safety Case and is a requirement under GS(M)R legislation requiring acceptance from the Health & Safety Executive.

We have an absolute statutory duty under Pipeline Safety Regulations 1996 (Reg. 13) which states that we shall ensure that a pipeline is maintained in an efficient state, in efficient working order and in good repair. This duty covers pipes of all material and is not solely limited to iron mains.

However, in the case of iron mains, we have a limited protection under the Pipeline Safety Regulations 2003 (Reg. 13a) which allows a defence to be put forward in the case of an incident through a failure of an iron main, providing that we have complied with a programme that has been approved by the HSE. Regulation 13a does not offer immunity from prosecution, nor does it afford any protection in terms of our duties under the Health and Safety at Work Act

This plan is based upon compliance with PSR Regulation 13 (applicable to all pipes) and also maintains the possibility to put forward a defence based upon the provisions offered by Regulation 13a for iron mains failures.

The activities described in this document reflect the requirement for the risk management of:

- Iron mains in conformance with the HSE's revised three tier approach;
- Steel gas riser pipes supplying multi-occupancy premises
- Other deteriorating iron and steel mains; and
- Service pipes

In developing our pipe risk management proposals, we have taken account of the statutory duties in the above areas. The resultant workload indicates a level of investment that allows us to continue to deliver high levels of safety, security of supply and a reduction in the risk posed by these pipes.

A six day HSE inspection of our end to end pipe risk management process was undertaken in February 2011 and resulted in no findings. The inspectors were complimentary of the strong governance processes and risk focus we have in place.

In order to fulfil our statutory duties, we apply a range of business policies and procedures that describe how our pipe network should be managed to comply with legislative, safety and compliance drivers.

Based on these policies and procedures, and a range of business planning assumptions around future innovation and opportunities to deliver increased customer value, this business plan has been developed and describes our future workload requirements and the associated costs.

This plan describes the profile of assets for which we are responsible and provides full details of our investment requirements in order to ensure that we continue to operate and maintain a safe, reliable and efficient network for our customers.

With respect to the iron mains risk reduction programme, we have carefully considered the revised three tier approach set out by the HSE and believe that we have justified our requirements.

However, our plan remains subject to the HSE formally updating its Enforcement Policy for Iron Mains to be consistent with the proposed 3-Tier approach as set out above. It also relies on the HSE ensuring that any necessary changes to the Pipeline Safety Regulations 1996 and 2003 are in place before the start of the GD1 period.

4.2 Network Asset Profile

We own and operate the gas distribution pipe assets in Southern. The main components of the distribution pipe network, which are the subject of our pipe risk management plan, are described below.

4.2.1 Distribution Mains

We operate 47,746km of distribution main operating at pressures up to 7bar. This pipe system is broken down into three pressure tiers as shown in the following table.

Table 1: Length of Distribution Mains

Distribution Mains (km)	Southern
Intermediate Pressure (2 to 7bar)	1,216
Medium Pressure (<2bar)	6,502
Low Pressure (<75mbar)	40,028
Total	**47,746**

This system can also be described in terms of the various pipe materials that have been used historically to construct the network, including iron, steel and Polyethylene. The following table provides a break down by pipe material.

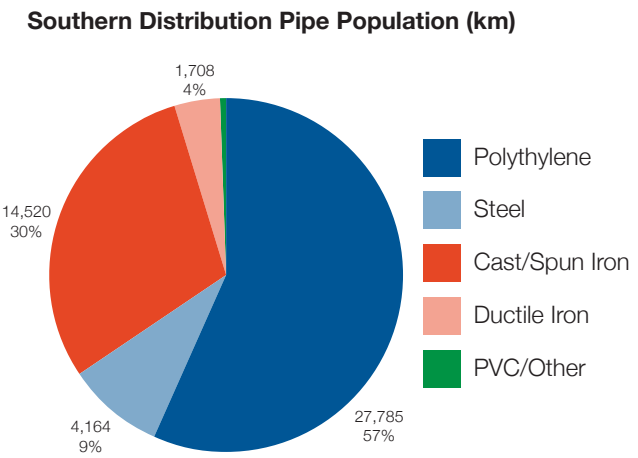
Table 2: Distribution Mains by Material

Distribution Mains (km)	Southern
Polyethylene	27,785
Steel	3,516
Cast/Spun Iron	14,520
Ductile Iron	1,708
PVC / Other	217
Total	**47,746**

Our plan is predominantly focused on the iron population but also takes account of the absolute duty we have to manage the risks of all pipes, specifically across the entire 19,744km of metallic pipe described in the table above.

The following chart shows that polyethylene now accounts for 57% of the distribution mains population.

Chart 1: Pipe Population by Material



4.2.2 Distribution Mains Risk Profile

All iron mains, and steel mains (=> 3") operating up to 7.0bar pressure are subjected to an individual detailed pipe risk assessment. From this, a Mains Risk Prioritisation System (MRPS) model is used to calculate the risk score for each pipe.

The MRPS system uses historical pipe performance data such as fractures, corrosion and joint failures as well as data collected from an on-site survey i.e. proximity to property, presence of cellars, etc. As the integrity of these pipes deteriorates over time, the risk score for any given pipe can dynamically increase as new failure data becomes available. This may also be the case where the survey data is updated e.g. a new property built adjacent to existing iron pipe.

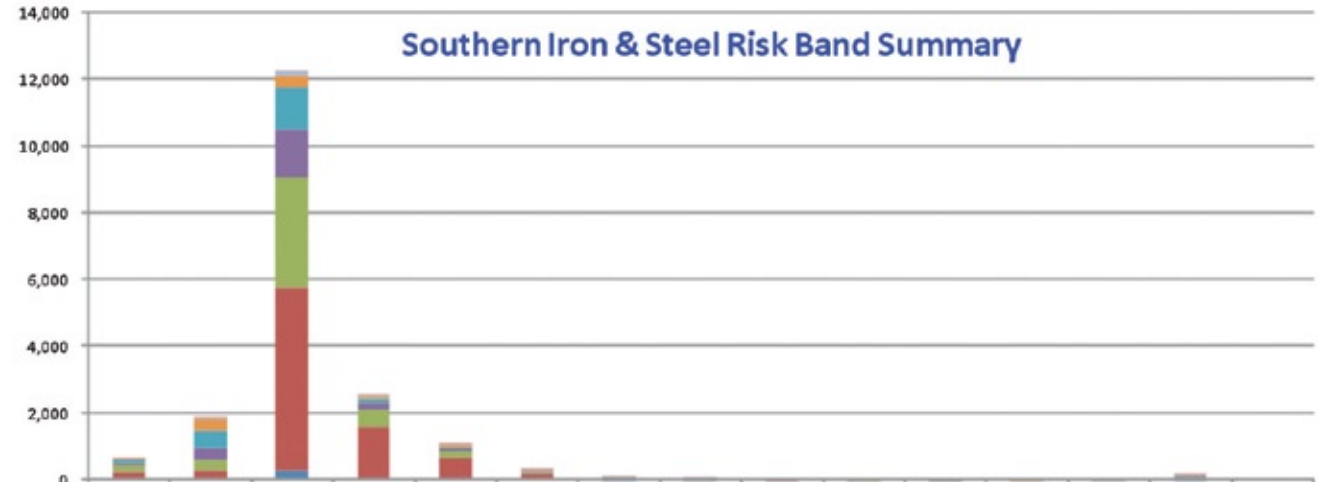
Where a pipe falls within 30m of property, it has a positive risk score; the higher the score, the higher the risk. For pipes greater than 30m from property, the risk model allocates a zero risk score. This distinction enables us to identify those iron pipes that are subject to the HSE 3 tier iron mains risk reduction programme.

The risk score of a pipe is expressed in terms of the likelihood of an incident arising from a failure of that pipe where leaking gas has entered a property and ignited leading to an explosion that results in one or more fatalities, serious injuries and/or major structural damage.

Of the 19,744km of iron and steel mains identified above (distribution mains population chart), a total of 19,495km are the subject of an MRPS risk assessment survey, the remainder being small diameter steel mains <=3".

Analysis of the underlying data indicates that 17,570km of iron and steel mains are within 30m of property. The chart below illustrates the current iron and steel mains risk profile in Southern.

Chart 2: Risk Band Profile for Iron and Steel Mains



	-1	0	0-30	30-60	60-90	90-120	120-150	150-180	180-210	210-240	240-270	270-300	300-330	>330	Total
Total	656.6	1,924.4	12,289.3	2,587.6	1,101.5	355.0	122.0	75.6	56.5	43.3	32.8	25.8	19.0	204.0	19,494.5
>24"	2.5	34.7	43.0	16.5	8.5	6.1	6.0	4.5	2.9	3.1	3.8	1.8	2.2	24.7	160.3
>18-24"	7.2	50.8	126.4	50.0	25.3	14.9	11.7	10.4	9.6	6.6	3.3	6.1	5.0	32.1	359.2
>12-18"	31.8	371.1	376.2	99.4	59.6	29.4	19.1	12.8	13.0	10.1	5.1	6.0	2.5	37.4	1,073.6
10-12"	83.2	514.2	1,266.0	131.8	58.5	21.5	6.4	4.9	2.8	4.7	4.4	2.7	2.9	34.9	2,139.0
8-9"	107.9	373.8	1,413.4	180.1	69.4	29.3	10.5	8.7	5.9	3.5	4.2	2.7	1.3	25.1	2,235.8
6-7"	172.5	315.7	3,306.0	502.7	223.6	55.3	21.2	10.2	5.7	3.5	3.1	0.7	1.3	23.3	4,644.9
4-5"	220.6	244.9	5,462.2	1,555.4	625.5	176.6	40.4	19.9	13.3	9.9	6.6	4.7	3.1	24.1	8,407.4
<=3"	30.8	19.2	296.1	51.6	31.0	22.9	6.5	4.2	3.5	2.0	2.3	1.1	0.7	2.4	474.4

Note: Pipes with a risk score of '-1' are awaiting re-survey, zero scoring pipes are >30m from a property

In both the Iron and Steel populations, the majority of mains pipes are in the risk score range of 0 to 30 (12,289km; 63%) and 30 to 60 (2,588km; 13%)]. Thus the population is generally approaching a point where it can be considered broadly homogeneous.

The individual risk score for each pipe multiplied by its length represents the calculated likelihood of an incident expressed in terms of incidents per annum x 10-9. Thus the sum of risk for all of these pipes gives a total risk of 0.24 incidents per annum. This is illustrated in Table 3 below for iron and steel.

Table 3: Total Risk for Iron and Steel

Risk Band	Steel	Iron	Total
-1	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000
0-30	0.0095	0.1490	0.1585
30-60	0.0076	0.1020	0.1096
60-90	0.0101	0.0699	0.0800
90-120	0.0091	0.0272	0.0363
120-150	0.0047	0.0117	0.0164
150-180	0.0036	0.0088	0.0124
180-210	0.0038	0.0072	0.0110
210-240	0.0038	0.0059	0.0097
240-270	0.0031	0.0053	0.0084
270-300	0.0022	0.0052	0.0073
300-330	0.0024	0.0037	0.0060
>330	0.1314	0.0713	0.2028
Total	0.1912	0.4672	0.6584

Note: Each pipe is allocated to a risk band depending upon its risk score

A pipe with a risk score of 30 has a likelihood of incident risk score of 30 x 10-6 incidents per km per annum

Thus the risk in Southern arising from the iron mains population is calculated to be 0.47 incidents per annum and the risk arising from the steel mains population is 0.19 incidents per annum, giving a combined risk of 0.66 incidents per annum.

4.2.3 Service Pipes

We supply our 4.0 million customers in Southern through service pipes constructed of either polyethylene or steel. Many of the steel services are replaced each year coincidentally with the mains decommissioning programme. Others are replaced in the course of repair and planned service pipe alteration activities. A proportion of these pipes supply high rise and low rise (tenement style) multi-occupancy buildings.

4.3 Distribution Pipe Risk Management Plan

4.3.1 Introduction

We have developed and set out our strategy to meet the requirements prescribed in the Pipelines Safety Regulations 1996 by managing risk across the entire population of mains and service pipes. In particular, this strategy recognises the HSE defined enforcement policy requirement to manage the risk of iron pipes within 30m of property in a structured way, adopting a new three tier approach based upon pipe diameter ranges as follows: -

Tier 1 – Iron mains less than or equal to 8" nominal diameter
Tier 2 – Iron mains greater than 8" and less than 18" nominal diameter
Tier 3 – Iron mains equal to or greater than 18" nominal diameter

Our strategy has been developed in line with HSE guidance that was given following a review of the iron mains replacement programme. This review was co-funded by the HSE and Ofgem and the work was undertaken by Cambridge Economic Policy Associates (CEPA) with technical contribution from Advanced Engineering Solutions Limited (AESL). The scope of the review was not restricted to the iron programme but also considered other pipe assets.

In addition to managing the risks posed by iron mains within 30m of property, we have also set out our strategy for managing the risks presented by the remaining pipe population, including iron pipes outwith 30m of a property, deteriorating steel, steel gas riser pipes supplying multi-occupancy premises and pipes of other non-standard materials e.g. asbestos. This was endorsed by a stakeholder during our 'Stakeholder Live' event in February 2011.

"I absolutely believe we should be continuing with it [the mains replacement programme]. You are managing down the risk but it isn't driving down fractures quickly and it is just about keeping on top of the deterioration because it's an ageing material"

In the current price control period, funding of the pipe replacement programme is based around a number of investment silos, each linked to a set of workload delivery outputs which include length of mains decommissioned (broken down by pipe diameter) and numbers of service pipes relaid or transferred. These silos currently limit our opportunity to balance risks across pipe asset groups.

As a result of the recent HSE review, we will have a continuing requirement to manage iron mains and other pipe assets (e.g. steel mains and services) separately and our plan reflects this approach. We will continue to engage with the HSE for a move to a more holistic approach managing pipe risks across all materials with a review and potential change in secondary legislation scheduled for 2017.

This plan has therefore been developed on the basis of the three tier approach to iron mains as set out by the HSE and the continued decommissioning and replacement of other pipe assets where required due to their condition and/or the risk they pose.

4.3.2 Detailed Description of Workload Components

This section provides a summary for each of the workload components that we are planning to address. Details of the derived workloads resulting from each of these work components, as they relate to our Southern network, are set out in the subsequent chapters.

4.3.2.1 Pipes forming part of the 3-Tier HSE Iron Mains Programme

i. Iron mains within 30m of property

All iron mains are subjected to an individual risk assessment including an on site survey. The pipes are held within a Mains Risk Prioritisation System (MRPS) that calculates a risk score for each pipe. The model is structured such that any iron pipe located within 30m of property has a positive risk score, the magnitude of which informs our pipe selection process. For these iron pipes, the HSE have set out a three tier approach, based on pipe diameter, as follows: -

- Tier 1 (Iron mains less than or equal to 8" nominal diameter)

The iron mains in this Tier must be decommissioned by 31st March 2032. In each year of the GD1 period, 20% by length of those pipes presenting the highest risk must be selected for decommissioning with the remaining 80% unrestricted, allowing selection from the remaining Tier 1 population.

- Tier 2 (Iron mains greater than 8" and less than 18" nominal diameter)

We have defined, and gained HSE approval for a risk based threshold for Tier 2 pipes that defines a fixed mandatory length over the GD1 period of those iron pipes presenting the highest risk. This length is based upon an option supported by the HSE that uses mandatory pipes in Tier 2 during the current price control period as a reference. These pipes will be the subject of proactive pipe risk management.

In setting a threshold for Tier 2, we also considered setting a risk score threshold based upon statistical analysis of incident and fatality data. However, we do not consider this analysis to be sufficiently robust and are particularly concerned that it would have to be applied in isolation to iron pipes in Tiers 1 and 3.

We have therefore given the HSE a clear undertaking that we will work collaboratively with other gas distribution networks to develop the MRPS system, covering pipes of all diameters, in order to establish an updated system that considers the consequences of pipe failure alongside the likelihood. This will provide a balanced and consistent risk assessment across all iron pipe diameters.

The remaining non mandatory Tier 2 iron pipes have been reviewed in line with guidance provided by the HSE to ensure that we are properly considering opportunities for strategic design and efficient development of Tier 1 projects. HSE also recognise the need to consider the wider environmental benefits as well as our own commitment to deliver excellent customer service.

In some cases, the opportunity will be taken to design iron risk out of the network entirely, allowing greater operating flexibility and the benefits of not having to return to an area on a piecemeal basis in the future to undertake repair works or further replacement works. We believe this is the right thing to do and avoids stranding short lengths of iron in an otherwise polyethylene network.

Tier 2 non mandatory pipes are therefore included in our plan on this basis where we can optimise overall project efficiency, address pipes in a poor condition and contribute to the delivery of other outputs such as leakage reduction.

- Tier 3 (Iron mains equal to or greater than 18" nominal diameter)

The approach to managing the risk presented by pipes in Tier 3 is consistent with our treatment of the non mandatory pipes in Tier 2. We will consider new approaches to pipe risk management that may allow the decommissioning of pipes in Tier 3, and Tier 2 pipes where appropriate, to be deferred.

It is important to recognise that the approach to iron mains that we have set out in this plan relies on the HSE formally updating its Enforcement Policy for Iron Mains to be consistent with the proposed 3-Tier approach as set out above.

It also relies on the HSE ensuring that any necessary changes to the Pipeline Safety Regulations 1996 and 2003 are in place before the start of the GD1 period.

ii. Steel services associated with iron mains programme
Typically, in the course of undertaking iron mains replacement, connected service pipes are either relaid or transferred. The workload is driven by, and is proportional to, the total length of main decommissioned as part of this programme. Where pipes are remediated or deferred, we will consider whether the replacement of connected steel services should be completed at the same time.

4.3.2.2. Other pipes outside of the Iron Mains Programme

Consistent with our duties defined in the Pipeline Safety Regulations 1996, we have set out a programme of pipe risk management (including decommissioning) for pipes outside the iron mains programme. Drivers for intervention include known integrity related safety issues, response to public reported escapes, multiple repairs and economic considerations.

i. Steel mains within 30m of property
In 2002, the surveying of mains pipes was extended to all distribution steel mains =>3" diameter. From around 2004, risk scores have been available within our MRPS model for these steel mains and data is held on a comparable basis to iron.

As with iron mains, those steel pipes with a positive risk score greater than zero are, by definition, within 30m of property and those with a zero risk score are greater than 30m from property.

As a responsible pipeline operator, this risk assessment data for steel pipes provides a valuable tool when considering possible intervention actions.

ii. Steel mains outwith 30m of property
It is evident that a proportion of our steel mains population are already in a deteriorating condition and will reach the end of their useful life during the GD1 period thus ceasing to be considered fit for purpose. Extensive deterioration, usually severe corrosion of the pipe wall, results in an ongoing requirement for mains repair. Those mains operating within the low pressure range (<=75mbar) are also prone to water ingress, particularly where the water table has risen above the pipe. In the case of single feed systems this has sometimes resulted in a loss of supply to our customers. With pipes operating at medium pressure (>75mbar to 2bar) there is an additional operational safety risk associated with physically working on these pipes in the course of excavating down on to the pipe to affect a repair. This is further exacerbated during the winter period when opportunities for a full pressure reduction may not be available.

iii. Other iron pipes
Iron pipes outside of 30m from property, particularly ductile iron operating at medium pressure, are becoming a concern from an operational safety perspective with increased risks to our operatives when working on these systems due to the catastrophic corrosion failure of the pipe in the course of undertaking an excavation to gain access for a repair. Where a pipe is the only feed into a small town or village, the failure of that pipe also presents a risk to the continuity of supply to that area. These factors will be fully considered when deciding whether intervention is required.

iv. Pipes of a non-standard material (Asbestos, PVC, etc)
The current policy approved by the HSE is to decommission pipes of a non standard material when found and this gives rise to a small annual workload. However, for the larger population of PVC pipes, this should be by 31st March 2032, typically in parallel with the iron mains programme.

v. Riser pipes supplying multi-occupancy properties
We have a large population of steel pipes constructed inside of high rise and low rise multi occupancy premises. These pipes are generally small diameter steel which, to a greater or lesser extent, exhibit signs of external pipe corrosion. When deterioration in pipe integrity is at an advance stage, this in turn results in pipe failure and gas leakage within the property and leads to the requirement for a pipe repair to be completed. Where a repair cannot be affected, the riser pipes are replaced thus maintaining supplies to our customers.

The consequences of a significant pipe failure, potentially resulting in a gas explosion, are much higher than for a single domestic property and we therefore propose to continue with our existing risk management programme that will continue to reduce the risks presented by these pipes over the next price control period and beyond. These pipes will be risk managed in line with our new, industry leading procedure, SGN/PR/REP3 and we have set an output measure based upon the number of riser pipes where the risk has been managed down to an acceptable level including complete decommissioning where this is the only safe option.

Where it has been necessary to decommission a riser pipe following a reported gas escape, it is often the case that our customers are disconnected from the gas supply for an extended period of time. We fully support affected customers over this period and this often results in significant compensation being paid under requirements stipulated in The Gas (Standards of Performance) Regulations 2005, Regulation 7.

These pipes will be risk managed in line with our new, industry leading procedure, SGN/PR/REP3

vi. Service pipes not linked to the Iron Mains Programme

- Relays and transfers not associated with the iron mains programme

Service relays and transfers undertaken in association with other mains replacement activities outwith the iron mains programme. The service workload is again proportional to the length decommissioned.

In addition, we will continue to replace steel services on find when discovered in the course of responding to reported gas escapes on the service and customer driven service and/or meter alteration works.

- Failing metallic service components

In the last 24 months we have identified an emerging integrity issue with the catastrophic failure of the metallic component parts of a polyethylene service. This is commonly being found as very severe corrosion of the horizontal steel pipe contained inside the wall sleeve on above ground service entry tees running through the wall cavity. Further work has been commissioned to understand the scale of the issue and new codes have been established in our asset repository to capture individual instances allowing a workload to be developed.

vii. Rechargeable and non rechargeable mains diversions

There is a relatively constant workload of mains diversions, usually third party driven that result from highways work, other utilities activities and new building programmes. Most commonly it is possible to recharge for these works subject to NRSWA and NJUG agreements for cost sharing. In a few cases we are not able to charge for the diversion and this is most commonly the case where a clause in a wayleave agreement requires us to remove the pipe and re-route at our own cost.

4.4 Our Approach to the HSE 3-Tier Iron Mains Programme

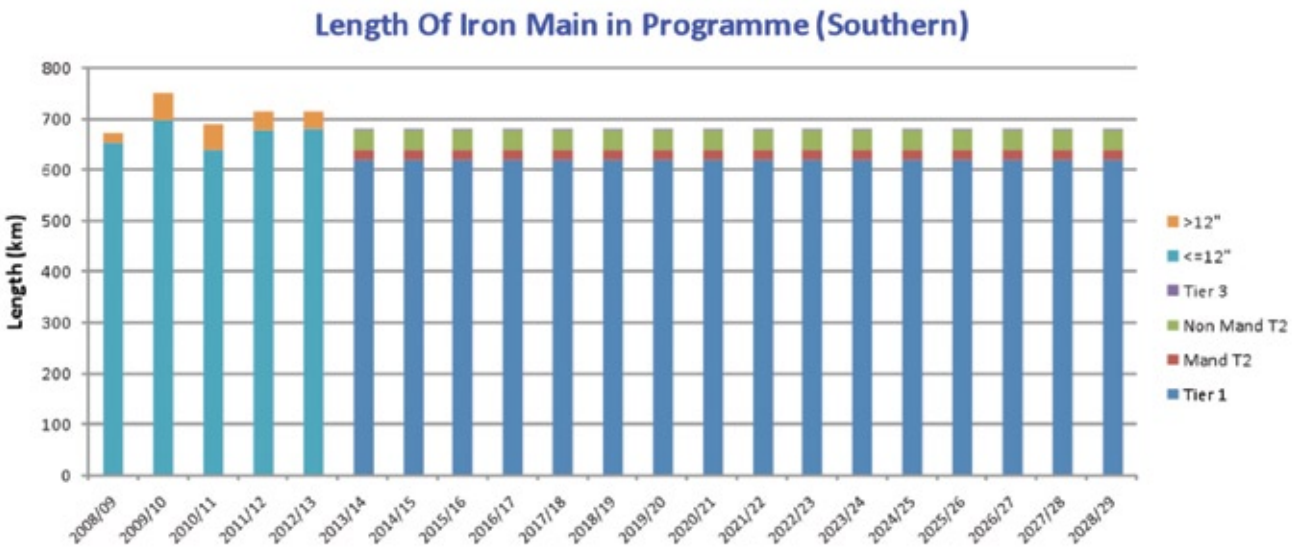
This chapter sets out our approach to the HSE 3-Tier iron mains risk management programme and describes the work we plan to undertake in each tier.

4.4.1 Introduction

As described above, this programme ensures that we are able to comply with Regulations 13 and 13a of the Pipeline Safety Regulations 1996. Regulation 13 requires us to maintain our pipe assets in a fit for purpose condition and Regulation 13a requires us to submit an iron programme to the HSE for approval.

The graph below shows our long term plan for the pipe risk management, including decommissioning, of iron mains by diameter tier out to the end of the GD2 price control period (2028/29). It is based upon an assumption that the statutory requirements prevailing during the GD1 period remain unchanged throughout the period of GD2. Data for current GDPCR1 period from 2008/09 to 2012/13 is presented in the current format of <=12" and >12" diameter.

Chart 3: Length of Iron Main In Programme (08/09 to 28/29)



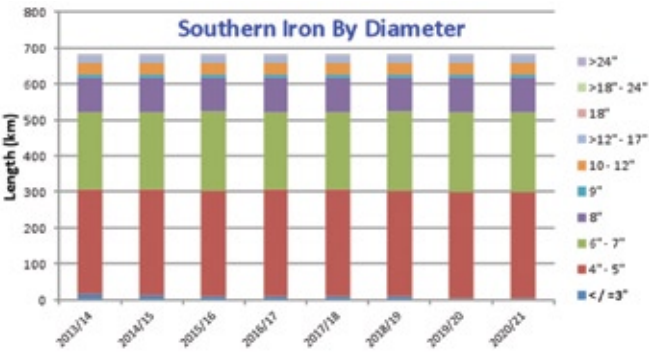
The annual workload during the GD1 period consists of a programme containing 680km of iron mains that will be subjected to a range of pipe risk management interventions including pipe decommissioning and replacement. This is detailed by HSE diameter tier in the table below.

Table 4: Pipe Risk Management Length (km)

Network	Mandatory		Non-mandatory		Total
	Tier 1	Tier 2	Tier 2	Tier 3	
Southern (km)	618	18	40	4	680

Our programme for the GD1 period has been the subject of a further more detailed analysis, broken down by diameter band. The detail has been derived from outputs from a Mains Replacement Decision Support Tool (MRPGas) and historical data for the network. The graphs below show the detailed breakdown by diameter band for the GD1 period. The diameter bands are an extension of the existing Ofgem bands, expanded to accommodate the new three tier approach.

Chart 4: Iron Programme by Diameter



4.4.2 Iron Pipe Risk Management

Our approach to iron pipe risk management has been based on the three tier approach described in Section 3.2.1 (i).

• Tier 1 (<=8")
We will identify the top 20% by length of those iron pipes presenting the highest risk and develop mains replacement projects around these pipes. The remaining 80% by length of iron pipes each year will be selected to optimise project efficiency and deliver other benefits including reduced leakage and mains repairs. In some cases, projects will be developed using pipes from the 80% only with no direct connectivity to pipes from the top 20%. This gives rise to an annual workload of 618 km per annum.

• Tier 2 (>8" to 17")
As a result of the HSE requirement to set a risk threshold for Tier 2 iron pipes, the remaining population in this tier has been divided into those pipes that will be mandatory to address over the GD1 period and those that are non-mandatory and subject to a cost benefit analysis.

– Mandatory Pipes - We have set an historical risk based length threshold for Tier 2 iron pipes that will require 18km per annum of iron pipe to be subjected to a programme of pipe risk management, including refurbishment or decommissioning. The details of how the risk threshold has been set are described in Appendix 'I1' of the pipe risk management appendices.

– Non Mandatory Pipes – Our plan includes an additional 40km per annum to be subjected to a programme of pipe risk management, again including refurbishment or decommissioning. Selection of these pipes has been driven by opportunities to further develop projects around Tier 1 pipes as well as other considerations such as safety risk, pipe integrity/condition and loss of gas supplies resulting from pipe failure. The detailed cost benefit analysis that supports the criteria for pipe selection in this category has been set out in Appendix 'I2' of the pipe risk management appendices.

• Tier 3 (=>18")
Tier 3 pipes are also designated as non-mandatory. We have included in our plan a programme of pipe risk management, including refurbishment or decommissioning, for 4km per annum of pipes in Tier 3. This workload represents a significant reduction from current levels and represents only 0.6% of the total length of main across the three tiers. Our approach for Tier 3 iron pipes is consistent with that for non-mandatory pipes in Tier 2 and is also described in Appendix 'I2' of the pipe risk management appendices.

For iron pipes in all tiers, but specifically targeting pipes in Tiers 2 and 3 where decommissioning costs are greater, we will continue to develop our innovation programme such that alternative approaches to pipe risk management, other than pipe decommissioning and replacement, can be developed and introduced. Any such development would have to remain compliant with prevailing legislation and be acceptable to the HSE.

In particular, we are leading a UK wide research and development project with the Water Research Council and other partners to develop new pipe lining techniques for large diameter iron pipes (>12") that could enable the management of pipe risk without the need for expensive wholesale pipe replacement. The first phase of this project is scheduled to start in winter 2011.

• Associated Service Pipes
In the course of working on iron mains, we will take appropriate action with the service pipes attached to these mains. Depending on the service pipe material, action will include a transfer of the service on to a new main or, where required, a service replacement (relay). Our programme includes 81 service actions per km of iron main, on average comprising relays 57.6, 22.5 transfers and a small number of services supplying non domestic premises. These ratios and the resulting annual workloads are shown in Table 5.

Table 5: Service Ratios and Volumes (Iron Mains)

Service Action	Ratio (per km)	Annual Volume
Service Relay	57.6	39,167
Service transfer	22.5	15,273
Non Domestic Service	0.7	506
TOTAL	**80.8**	**54,946**

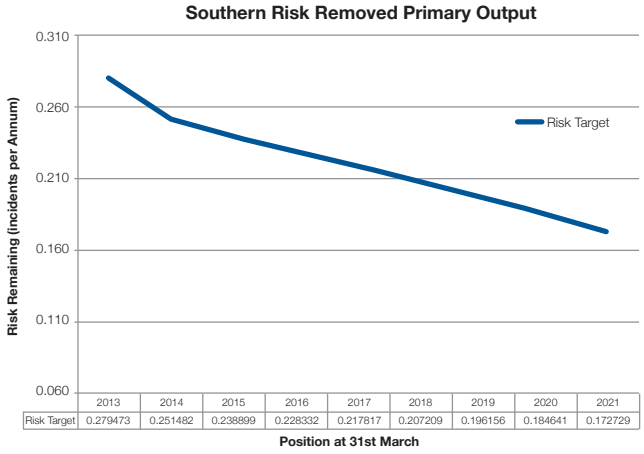
4.4.3 Output Measures (Iron Mains Programme)

The primary output defined for the risk management of iron pipes is 'risk removed'. This is supported by a range of secondary outputs including 'gas in buildings', 'numbers of fractures' and the asset health and criticality indices. These measures have been developed through the Ofgem Safety and Reliability working group.

The level of 'risk removed' has been calculated based on our programme for all of the pipes in Tier 1 and the mandatory pipes in Tier 2. This forms the basis of 'risk reduction' primary output measure for Southern network.

The forecast total risk in Southern network at the start of the GD1 period is 0.279 incidents per annum. This will reduce by 38% to 0.173 incidents per annum at the end of the period. This is illustrated in the graph below which shows the risk remaining at the end of each year.

Chart 5: Annual Risk Remaining



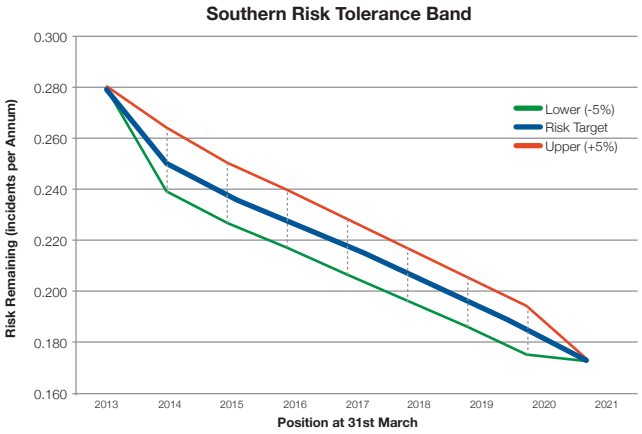
Our stakeholder engagement process identified a very clear requirement from local authorities, highway authorities and councils to increase the level of flexibility we can offer in terms of the timing of our works. This would significantly enhance their ability to co-ordinate streetworks more effectively and would increase opportunities for us to co-ordinate our own work with other utilities.

We have robust processes in place to adjust the timing of our works between years, albeit on a reactive basis. This process has been inspected by the HSE and found to be an effective risk management system. We therefore propose to adapt this process to take a more proactive approach to the timing of our works in response to the stakeholder feedback we have received. This quote came from a highways manager at one of our Replacement stakeholder meetings.

"Broadly we understand the issues and why you carry out mains replacement, replacement projects have been put back 6 months to enable works to happen together so there is flexibility and ultimately that is all we a asking for, a degree of flexibility … we can get a win, win for everybody."

To accommodate this flexible approach, we propose to operate a 5% tolerance around the annual 'risk removed' target that will allow flexibility between years whilst delivering the overall risk target required over the GD1 period. We have discussed this approach with the HSE and have agreement in principle. This approach is illustrated in the chart below.

Chart 6: Annual Risk Tolerance Band



This chart illustrates that, from a fixed starting risk position in 2013, some flexibility can be exercised through the programme whilst ensuring the target position in 2021 at the end of the eight year programme is achieved.

However, we also recognise increasing pressure on all utilities when undertaking streetworks, particularly in the more urban areas where we operate. The challenges for us are even more demanding in large cities such as London where a 24 hour economy places even more pressure on our ability to operate in these areas. As local authorities develop new initiatives to improve traffic flows and reduce congestion during peak periods, we anticipate that the flexible approach we propose will become more challenging. However, we will continue to innovate and develop our project planning and coordination activities to adapt, as far as is possible, to the changes that lie ahead.

Inevitably, additional requirements to operate during night time hours and over weekend periods will place an additional cost pressure on our operations. Our plan recognises these pressures but also builds in a level of increasing productivity (efficiency) that has an offsetting effect on these upward pressures.

4.5 Our Approach to Other Mains Outside the Iron Mains Programme

4.5.1 Introduction

As previously set out in Section 3.1 above, we intend to manage risk across the entire pipe population including the risks posed by other pipes outside of the Iron Mains Risk Reduction Programme.

Our programme for these mains pipes ensures that we remain compliant with the absolute duty set out in the Pipeline Safety Regulations 1996 (Regulation 13) that requires known integrity issues with pipes to be addressed through repair (maintenance) or replacement. This section of our plan deals with the intervention required, including decommissioning of pipes, where no alternative is viable. This work is in addition to the three tier iron mains risk reduction programme.

We have a well established multi-disciplinary management team which operates as a sub-committee to our Distribution Safety and Engineering Committee. This is known as the Condition Review Group with senior managers involved from across our business. This group meets regularly to review intelligence received from our operational workforce and the outputs from our condition monitoring tools. This data is used for the prioritisation of pipes for decommissioning each year. As a result, our programme includes work required on grounds of pipe condition, safety or economic reasons.

The following pictures provide examples of pipes submitted to the group for consideration. The group will assess the safety risks and recommend a course of appropriate action which may include decommissioning and/or a programme of repairs. In some cases additional monitoring will be put in place where the immediate issues have been rectified e.g. repairs completed.

This picture shows a 6” steel gas main suffering with severe deteriorating condition. As can be seen there are multiple through-wall corrosion instances.

This picture shows an 8” steel gas main operating at pressures between 75mbar and 2bar, showing severe signs of corrosion. In this instance the main has suffered multiple through-wall corrosion events.

This picture shows a 6” steel gas main that had a repair clamp fitted in the past. As can be seen the gas main is in a continuing state of deterioration resulting a large through-wall corrosion incident alongside the pipe clamp.

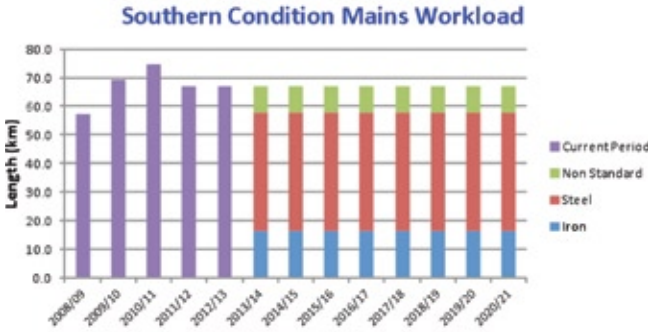
This picture shows a 4” ductile iron gas main operating at pressures between 75mbar – 2bar. This gas main has multiple temporary repairs inflicted through continuing severe corrosion. In this instance, the gas main was decommissioned due to its poor deteriorating condition.

This picture shows a 12” ductile iron gas main suffering with severe joint corrosion. As can be seen the joint ring and bolts have completely corroded away. New bolts have been installed as a temporary repair measure.

4.5.2 Other Mains Workload

The graph shown below represents a range of materials to be decommissioned including steel, a small proportion of non-standard materials, and iron mains that are outwith 30m from property. In total 67km per annum has been included in our programme for the GD1 period. This level of workload is consistent with the average in the current price control period as illustrated and addresses the continuing year on year deterioration of the remaining metallic population.

Chart 7: Condition Driven Decommissioning Workload



4.5.3 Services Associated With Other Mains

The treatment of services in this category is the same as for the iron mains risk reduction programme. In the course of working on these mains, we will take appropriate action with the attached service pipes. Depending on the service pipe material, action will include a transfer of the service on to a new main or, where required, a service replacement (relay). The resulting ratios and annual workloads are shown in Table 6.

Table 6: Service Ratios and Volumes (Other Mains)

Service Action	Ratio (per km)	Annual Volume
Service Relay	57.6	3,859
Service Transfer	22.5	1,505
Non Domestic Service	0.7	50
TOTAL	**80.8**	**5,413**

4.6 Newly Laid Replacement Mains

In almost all circumstances, a replacement main will be laid although historically it has been possible to lay less new main than the length being abandoned. Usually, through efficient planning, opportunities are taken to reduce lay lengths where possible, the best example being the replacement of two parallel mains with a single new main. The ratio between abandonment and lay is known as the 'abandonment ratio'. The historical ratio, applied in this plan, is 1.05 to 1.00 for the iron mains risk management programme and 1.10 to 1.00 for other mains.

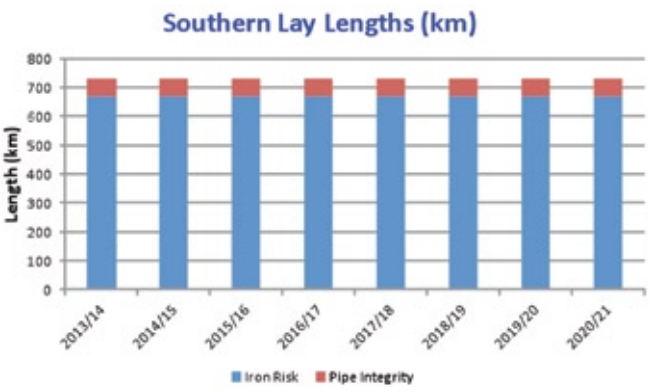
Our design process seeks to maximise opportunities for mains insertion as this methodology significantly reduces road congestion. However, this approach does lead to a lower abandonment ratio. We will optimise our designs by increasing operating pressure where possible to further facilitate insertion. However, operating pressure has a direct impact on the Shrinkage / EEI incentive and this is more fully explained in Section 6.2 of our plan. The most economic overall solution will always be selected and we will continue to research and develop new materials and new methods of pipe laying to further improve the efficient delivery of this programme.

"I think that it is a case of continuing at least at the pace it is now and looking at ways of innovating and improving efficiency and ways of doing things differently, and with that, gain a bit more ground".

Future mains lay lengths have been developed based on an extrapolation of historical data. Typically the new mains we lay will be smaller than the mains being decommissioned as opportunities for the use of insertion techniques are maximized through efficient design and use of modern polyethylene materials.

When designing mains replacement schemes, the most efficient design may identify an opportunity to lay larger pipes than those being decommissioned and this is generally referred to as 'upsizing' (as opposed to replacement on a like-for-like or downsized basis). Where this opportunity is identified, the benefits realised through the marginal additional cost of laying a larger pipe include local reinforcement of the downstream network and opportunities to increase the levels of mains replacement by insertion further downstream. Our planned mains lay lengths, including upsizing, are shown in the graph below.

Chart 8: Mains Lay Lengths



Stakeholder events attended by highway departments have made it clear that we must develop mains replacement schemes that minimise, as far as is reasonably practicable, the impact on traffic congestion in built up areas; it is becoming much more difficult to maintain current levels of project efficiency. A good example of this is a requirement to work during off-peak traffic periods in some areas which tends to require working during premium time hours i.e. Sunday and night time working.

The potential impacts of the Traffic Management Act have not yet been fully seen as this legislation is still being rolled out in local authority areas across Southern

However, Ofgem have recognised the significant impact that could result from full enforcement by local authorities and have indicated in their March 2011 decision document that this can be built into Business Plans as an uncertainty mechanism.

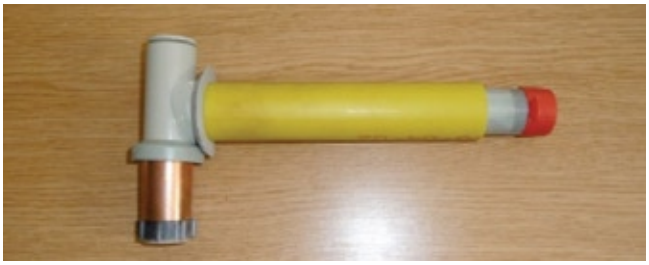
4.7 Mains Diversions

On an annual basis, we complete a number of mains diversion projects on our <=7bar distribution network. These are required to enable the works of third parties including highway authorities, other utility companies and developers. The majority of these diversions can be recharged although some are not rechargeable such as those where a lift and shift clause is incorporated into legacy easement / wayleave agreements. Workloads vary each year as it is predominantly driven by third parties. Typically we see on average around 9km of pipe decommissioned in Southern. The treatment of associated services is the same as for other mains decommissioned.

4.8 Other Service Pipes

Our plan also takes account of service relays that result from emergency gas escape work, customer driven service alterations and also meter alterations that have an effect on the existing steel service pipe.

In addition, a number of service pipe integrity issues have been identified and quantified by our Condition Review Group that will need to be addressed during the GD1 period. Specifically, we have encountered failures of the steel pipe wall on a number service entry tees due to corrosion and associated metal loss.



This picture shows an above ground service entry tee in original condition. The steel entry pipe is enclosed and sealed within the plastic sleeve that is installed through the wall of a property above ground level.

Following an investigation commissioned by our Condition Review Group, it was found that common factors in the examination of the service entry tee components were loss of protective coating on the tee body and corrosion underneath the coating of the pipe. It was found that the principal factor responsible for the corrosion of the service entry tees was the premature failure of the coating, and/or lack of protection offered to the underlying steel components. The following photographs illustrate recent data gathered which is currently being fully investigated by the group.

This picture shows an installed above ground service entry tee in a corroded condition. The steel pipe inside the plastics sleeve (through the property wall) is not visible and cannot be inspected without the service being decommissioned.

This picture shows the extent to which the plastic sleeve has been distorted as the internal steel pipe has corroded.

This picture shows a decommissioned tee with the plastic sleeve removed. The steel pipe inside is clearly severely corroded. This section would have been inside the sleeve, inside the property wall as illustrated.

This picture shows another example of pipe corrosion and severe metal loss.

In summary, total service workloads associated with the programmes described above are shown in the table below for the GD1 period.

Table 7: Service Workloads

Service Actions (No.)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Service Relays	43,518	43,518	43,518	43,518	43,518	43,518	43,518	43,518
Service Transfers	16,970	16,970	16,970	16,970	16,970	16,970	16,970	16,970
Non Domestic	562	562	562	562	562	562	562	562
Relay (escape/alteration)	13,457	13,457	13,457	13,457	13,457	13,457	13,457	13,457
TOTAL	**74,507**	**74,507**	**74,507**	**74,507**	**74,507**	**74,507**	**74,507**	**74,507**

4.9 Gas Risers to Multi-Occupancy Premises

We have a large proportion of supplies to multi-occupancy high rise and low rise premises which are normally of steel construction. These risers are inspected as part of an ongoing site survey programme.

Replacement work is necessary where these pipes have failed beyond repair or are assessed to be in an unsatisfactory condition. It is also considered when the riser pipes are connected to mains being worked on as part of our planned work programme.

In 2011, we led the industry with the introduction of a new risk based management procedure (SGN/REP/3) that sets out our future approach in respect to these assets. This will support the proposed transition to a more holistic approach to pipe risk management covering all pipe assets. We are aware of the increased HSE concern in this area and were able to satisfy them during their six day inspection that we have a robust management system in place for these assets.

We therefore plan to continue with a programme of pipe risk management, removing the risks presented by these pipes on a prioritised basis. Further details are set out in Appendix 'I3' of the pipe risk management appendices.

4.10 Planning the Mains Replacement Programme

In recent years, and with the introduction of the Traffic Management Act, it has become increasingly important to plan well in advance such that we can provide adequate notice to local authorities of our planned works. This must be balanced with a requirement to ensure the correct assets are being prioritised. This risk analysis is dynamic in nature as the most recent data and intelligence concerning the condition of the network (on a pipe by pipe basis) is utilised.

At present, we are able to provide our high level plans to local authorities over a five year window with detailed plans available for up to 18 months in advance. In future, following clear feedback from a wide range of stakeholder events, it is our intention to undertake more detailed project planning over an extended time horizon, potentially through to the end of the GD1 period and ensure these plans are discussed with relevant authorities at the earliest opportunity.

This approach has been welcomed by local authorities at our various stakeholder events.

4.11 Replacement Net Expenditure

Throughout the GD1 period we forecast net replacement expenditure for the workloads described above of £1,514 million (2009/10 prices) representing average annual investment of £189 million. Of this total expenditure, £104 million is linked to newly laid pipes that will be capitalised (upsizing). This is shown in the table below by asset type across the period.

Table 8: Net Costs (£m)

Southern	Net Costs (£m)					
	Repex Mains	Capitalised Mains	Total Mains	Services	Risers	TOTAL
2013/14	112.6	12.8	125.4	48.0	10.6	184.0
2014/15	113.1	12.8	125.9	48.2	10.7	184.8
2015/16	114.1	12.7	126.8	48.7	10.8	186.3
2016/17	114.9	13.4	128.3	49.2	10.9	188.4
2017/18	116.2	13.1	129.3	49.7	11.0	190.0
2018/19	117.5	13.1	130.6	50.2	11.1	191.9
2019/20	118.7	13.2	131.9	50.7	11.1	193.8
2020/21	119.8	13.2	133.0	51.2	11.2	195.4
Total	**926.9**	**104.4**	**1031.3**	**395.9**	**87.3**	**1514.4**

4.12 Funding Arrangements and Outputs

We propose that the £1,514 million of investment we require is funded through a single fixed ex-ante allowance for the GD1 period to undertake the work activities described in this plan, including mains, services and steel risers. This approach is broadly in line with Ofgem proposals and we support their view that this will provide better negotiating opportunities with our contractors and delivery partners. We will also be able to use a single high level allowance more flexibly to optimise our replacement programme to enhance our delivery in other areas such as reducing gas leakage from the pipe network and targeting parts of our network that currently have higher than average mains repair numbers.

This investment is linked to a range of outputs, and a breakdown by activity is provided in the table below with the defined output measure shown for each work activity.

Table 9: Programme Outputs

Activity		Value (£m)	Output Measure	Output Unit
Tier 1 Mandatory Iron	Mains	806.7	Risk Removed	Incidents / annum
	Services	201.8		
Tier 2 Mandatory Iron	Mains	37.7	Risk Removed	Incidents / annum
	Services	5.9		
Tier 2 Non-mandatory Iron	Mains	80.7	Pipe Risk Removed	km
	Services	13.2		
Tier 3 Non-mandatory Iron	Mains	12.1	Pipe Risk Removed	km
	Services	1.3		
Mains	Mains	89.8	Pipe Risk Removed	km
	Services	21.4		
Diversions	Mains	4.3	Length Decommissioned	km
	Services	0.3		
Other Services		152.0	No of Relays/Transfers	No
Risers		87.3	Riser Risk Managed	No of Risers
TOTAL		**1514.4**		

4.13 Benchmarking

Our mains replacement programme operates efficiently in a challenging environment where an increasing number of directives from local and highway authorities on the timing and construction schedule for our projects is creating additional cost pressures as we seek to accommodate the requirements placed upon us by these authorities as they fulfil their duties to reduce congestion, improve traffic flows and reduce disruption to businesses and the general public.

This is further exacerbated in the Southern region in which we operate where measures introduced as a result of the Traffic Management Act are more advanced than in many other areas of the country, particularly within the boundary of the M25 motorway where we incur premium rates for goods and services supplied under tender.

Our programme is assessed by Ofgem using comparative analysis with the other networks through the use of regression analysis, evaluating the costs of a programme against a weighted workload that accounts for network variances in length and diameter of pipe installed.

We fully support this approach and welcome the recognition by Ofgem in its analysis of the effect from regional cost factors, for example the additional costs of operating in London.

We also support the further analysis that Ofgem has undertaken more recently to review this analysis for Tier 1 (smaller diameter) iron pipes only. The workload associated with Tier 1 pipes in our network represents 88% of the total length decommissioned and unit costs for this work tend to be stable.

Conversely, we also agree that the larger diameter iron pipes in Tiers 2 and 3 represent a smaller workload with more volatile unit costs due to the greater engineering complexities involved in the construction of equivalent larger diameter replacement pipes. This volatility in unit costs makes the benchmarking through inclusion of these pipes in the regression less reliable. We also support removal of the non incentivised service activities examples of which include the replacement of a steel gas service following a report of a gas escape and steel service replacement following a customer led request to alter their service or the position of their gas meter. In each of these cases, the work activity is unrelated and therefore has no correlation with the core mains replacement programme.

Taking these and other material factors into account, we have reviewed the regression analysis published by Ofgem in its March 2011 decision document, also taking account of more recently available data including actual costs for 2010/11 as reported by each network as part of the Regulatory Reporting cycle and the additional costs of operating under an increasingly constraining TMA regime.

We therefore set out below our view of how these more up-to-date factors reduce the upper quartile gap for our network which is highlighted in the March 2011 published data. Our assessment details the associated adjustments that are required in order to present an up to date assessment taking into account the most recent data available.

4.13.1. Actual Costs for 2010/11

Regression analysis published by Ofgem in March 2011 included actual costs for periods up to 2009/10. Since that time, networks have submitted actual costs for the 2010/11

financial year and Ofgem has subsequently furnished this data to the networks in updated regression analysis files that take account of the most recent cost data available. Our assessment of the updated regression including 2010/11 actual costs shows that the upper quartile gap for our network closes by £4.6m per annum.

4.13.2. Tier 1 Pipes Only

As set out earlier, Tier 1 iron pipes account for 88% of the length decommissioned each year and tend to have more stable unit costs per meter of pipe installed. This is distinctly different to the larger diameter pipes in Tiers 2 and 3 where the unit costs of installation tend to be more variable per meter of pipe installed due to the increased challenges of construction of these larger replacement pipes. Similarly for non incentivised services, this work activity is atypical when compared to service replacement as part of a structured work programme. Our assessment of the updated regression including adjustments for Tier 2 and 3 iron pipes shows that the upper quartile gap for our network closes by £9.9m per annum.

4.13.3. Regional Factors

We fully support the use of Regional Factors by Ofgem to normalise their analysis for the differing costs of operating in different parts of the country. For very understandable reasons, the costs of operating in our Southern network are adversely impacted by the labour market, particularly the widely acknowledged additional costs for business when operating within London and the inner M25 geographical boundary.

With this in mind, we commissioned Deloitte LLP to examine Ofgem's approach to regional factors. Their report is fully discussed in the Efficiency section of our plan, but in summary the report states "We find evidence for both regional factors and real price effects and indications that their magnitude is likely to exceed the values proposed by Ofgem". Our assessment of the updated regression, including adjustments for updated regional factors aligned to the outputs of the Deloitte report, shows that the upper quartile gap for our network closes by £1.3m per annum.

4.13.4. Impact of the Traffic Management Act

In the current price control period, Ofgem included an uncertainty mechanism that would allow networks to recoup the additional costs incurred as a result of measures within the Traffic Management Act being rolled out by the enforcing authorities concerned. The trigger level for this uncertainty mechanism was reached by our Southern network in 2010/11. These costs were not incorporated into the March 2011 Ofgem analysis but have subsequently been provided to the networks. We have therefore included an adjustment in our updated regression analysis that takes account of the TMA costs that we and other networks have incurred up to the end of the 2010/11 period. Our assessment of the updated regression, including adjustments for TMA, shows that the upper quartile gap for our network closes by £3.9m per annum.

4.13.5. Urbanity (Impact of Working in London and Surrounding Area)

We have undertaken a range of analyses to compare relative productivity of our workforce inside and outside of the London area. Our observation is that the urbanity factors in London and surrounding areas have a significant impact on the delivery of our programme with a marked loss of productivity. Our analysis has compared the operation of our Greenwich Depot (broadly covering the inner London area) and our Charing Depot (broadly covering the Kent area). Both of these depots have seen the full rollout of measures such as the 'Permitry Scheme' and as such, the analysis can conclude that TMA in itself is not a contributory factor in any observed differences. Full details of our analysis are set out in the Efficiency section of this plan and, in summary, highlight a productivity gap of 21%. Our assessment of the updated regression, including adjustments for urbanity, shows that the upper quartile gap for our network closes by £9.3m per annum.

Having accounted for each of the factors described above, our analysis indicates a remaining gap of £3.8m to the upper quartile position. However, there are a number of other factors that we highlight below that we account for the balance if not more of the remaining gap. We do not have sufficient data to fully quantify the relative impact value of these factors and have therefore excluded them from our analysis process.

4.13.6. Other Factors That Impact the Regression Analysis

In addition to the factors set out above, we have also identified other discriminating factors that the analysis does not account for as set out below.

4.13.6.1. Abandonment Ratio

The regression analysis undertaken is input driven using actual costs incurred and length of pipe installed weighted by the unit cost per diameter band. Whilst this provides a valid insight into the relative efficiency of the inputs, it does not take account of the outputs in terms of the length of main decommissioned and the level of risk removed by the programme. As previously indicated, we are confident following the HSE inspection that the processes we have in place for iron pipe risk management are designed to maximise the level of risk removed relative to the length of pipe decommissioned. We have a consistent history in our network of abandoning more pipe than we install, comparison of which is known as the 'abandonment ratio'. In this current period we have seen this ratio on average at a rate of 1.06 to 1.00.

4.13.6.2. Compensation to Small Businesses

We have observed more recently an increasing requirement to address and where legitimate, settle compensation claims submitted by small businesses that are now being offered services by external agencies to pursue these claims on their behalf.

A table summarising our adjustments to the regression based on the most recent data available is shown below.

Southern Network	Adjustment (£m)	Upper Quartile Gap (£m)
March 2011 Ofgem Analysis		(32.9)
2010/11 Actual Costs	4.6	(28.3)
Tier 1 Iron Pipes Only	9.9	(18.4)
Deloitte Regional Factors	1.3	(17.0)
Traffic (Scotland) Act	3.9	(13.1)
Urbanity	9.3	(3.8)
Other Factors	3.8+	0.0

These adjustments result in what we believe is a more realistic comparison, offering an improved fit of the regression data with an RSQ value of 0.947 compared with 0.864 in the March 2011 decision document.

4.14 Stakeholder Engagement

We have carried out a series of stakeholder engagement activities to inform the development of this plan, including a 'Stakeholder Live' event in London in February 2011. At this event, we set out our vision for the future of our pipe risk management programme and sought the views of stakeholders on our plans.

The sessions were supported by externally facilitated discussions where small groups of our stakeholders were able to explore further with us the background to the programme, the drivers for continuing and the benefits of doing so.

Informed stakeholders ranked our mains replacement programme as the area of greatest importance to address in the price control review. The consumers consulted by Ofgem also thought that mains replacement was a high priority area ranking communication and delivery of the programme second and third respectively in a prioritisation exercise behind emergency response. This led to inclusion of replacement as a key topic throughout our general engagement events as well as arranging a number of targeted meetings. A selection of quotes from these events is included below.

"You renewed pipes in our High Street and left a link. I asked for it to be included but was told this could not be done. We have since resurfaced the road and are anticipating you coming along to dig it up." (Local Authority)

"SGN don't always consider disruption". (Local Authority)

"We are screaming out for more forward planning." (Local Authority)

"I have a project in my area where the gas and water are working together to lay pipes. They put out letters with both the logos at the top. This lets customers know that we are coordinating works." (Local Authority)

"Increased visibility and longer contracts would allow us to put more back into innovation" (Supplier of Goods)

"I get frustrated that you cannot even give us an accurate 1 year programme". (Local Authority)

"We consistently resurface roads, then you come along and ask to do mains replacement shortly afterwards." (Local Authority)

"SGNs take up of our new products is poor compared to other countries such as China and the Emirates." (Materials provider)

"Reliable network is the main thing, if you've got a reliable network, your emergency response requirement drops. Your customer satisfaction comes from having a reliable network in the first place and you are not investing more money than you have to, to pay for social issues and environment". (Gas Consumer)

Although the replacement programme was ranked third highest in priority at our consumer focus group sessions, the number one area of frustration, throughout the discussions, was the perceived lack of coordination of road works. At Ofgem's Consumer First sessions disruption caused by road works was also highlighted as a key issue for network companies to address. Although this disruption was seen as lower impact than safety and reliability, the frequency of occurrence was thought to be much higher with many people recounting personal experience.

Our proposed approach to mains replacement has been widely welcomed with the only proviso being that it would have to be introduced in conjunction with improved planning and communication. Consumers supported the level of spend even though it is the largest element of the distribution charge. The potential for increased efficiency with our proposed approach was a factor in their support for it.

Follow up events were then held with a specific focus on mains replacement activities including one in London. These events were well attended with delegates including representatives from local authorities, contractors and material providers and gas suppliers. Local authorities were consistent in their message that they require increased notice periods and improved coordination of onsite works. Material providers and contractors also expressed a desire for increased future workload visibility so that they can secure resources and appropriate contracts from their suppliers. A selection of feedback from these events is included below from City and Local councils and suppliers of goods and services. References to SGN pertain to Southern Gas Networks.

- More sensible schemes are required, SGN are coming back to the same area too often. This is affecting local businesses, are we able to liaise in advance to see what would suit that particular area.
- During works in Canterbury gas and water companies are working together, they are sending out dual letters which gives confidence to general public that the utilities are in control – This is a good example of joint working is a success.
- LAs cannot sustain frequent visits by the emergency teams, in these instances the LAs are pushing for projects to be pushed forward – Are we able to accommodate such cases?
- Generally they are finding that only 90% of work in completed, they are finding that they are repeatedly asking for the remaining 10% to be done. SGN need to listen to local authorities, flexibility needs to be taken into consideration to decrease the disruption.
- It is possible for utilities to submit their plans us to a year in advance as it is a first come first serve basis that the LAs operate. It is vital that the LAs see a programme of works.
- Where there are traffic sensitive roads are SGN able to complete double shifts i.e. start earlier, finish later and work weekends? This would avoid the rush hour and give the positive sighting that people do work on site.
- Forward planning is always welcome although SGN will need to liaise with each LA to maximise benefit.
- Managers of SGN do not understand noticing system. How much do SGN managers understand, as the LAs are managing for us?
- The more work SGN want to do the longer it will take which will give less time to complete other work. Innovation will bring speed to the process.
- Supplier needs to see future visibility.
- Contractors are not given any time to do real planning. SGN should be giving major projects at least 2 years warning – longer term visibility is required.
- Projects that have joined up pipe work need to be forward planned so that contractors can work out timings.

We also ran internally focused staff consultation events. There was unanimous agreement that the new approach provided opportunities to drive efficiency and improve our control of this workload. A selection of quotes is included below.

"We had a job last year with a lot of traffic management. Caused all kinds of problems and made headlines in the local press. Now we're being told that we need to go in again next year to do a bit that we could have done at the time." (SGN Staff)

"We completed an 11km project a few years ago on a housing estate with our contractors and the customer service was brilliant. We only had one complaint for the whole job." (SGN Staff)

"I think it would be a lot easier to manage one or two large projects rather than loads of smaller ones like we do now." (SGN Staff)

Finally, at a consultation event we carried out at the Society of the British Gas Industry (SBGI) there were strong feelings that we should be continuing with our replacement programme. There was support for our zonal approach and also for looking at a holistic approach with one attendee commenting …

"It makes no sense to have a risk model for one asset type (iron mains) and an adhoc/reactive approach for other assets. It makes sense to look at all assets to properly prioritise work and reduce risk in the most effective way." (SBGI Member)

In summary, we had a high level of support at all of our stakeholder events for the continuation of our mains replacement programme, and with key feedback as follows:

- Removing risk is important but the costs have to be reasonable and efficient
- We need to find ways of being more flexible in the scheduling of our work to make the task of improved coordination more achievable
- The excellent reliability of our network, providing gas without interruption, even during the worst winter conditions, was still an important deliverable, 'nobody wanted the gas to go out'
- We need to work smarter to drive out the consequential opex costs of a deteriorating network
- We need to take a more holistic view, not just taking out risk but also delivering the environmental benefits and maximising other advantages that the programme delivers.

In September 2011, we issued our consultation paper on proposals for our Business Plan. Following feedback from key stakeholders, we have reviewed and revised our pipe risk management plan. We believe that this plan now provides value for money for our customers while continuing to meet our statutory requirements.

All stakeholder groups have supported our proposed approach to pipe risk management and we believe that

the plans we have set out address and resolve many of the issues they have raised with our current programme. In particular, the opportunity to increase the flexibility of our project development tackling zones in one go, providing longer planning notification periods and responding more flexibly to requests to accommodate opportunities for multi utility coordination.

4.15 Uncertainty Mechanisms

There are a number of uncertainties that have been identified including TMA, lane rental and potential changes to statutory instruments e.g. PSR in 2017. These are discussed in Section 2.4 of our plan, which sets out our proposed uncertainty mechanisms.

Providing Excellent Customer Service

Summary

Our company vision is to be the leading network operator in the UK. We have consulted our stakeholders and know to achieve this we need to provide excellent customer service in everything we do; this is one of our core values.

This chapter sets out the initiatives we have developed in consultation with our stakeholders and plan to implement over RIIO-GD1 to deliver our vision and value.

In summary, we plan to implement a revised operating model that will focus on the service delivered by customer facing staff and a robust ongoing stakeholder engagement programme to:

- Deliver overall customer satisfaction scores of 9 out of 10 (to be confirmed once the results of the current customer satisfaction trials are available) by the end of GD1
- Reduce reportable customer complaints by 30% by the end of GD1
- Reduce referrals to the Ombudsman by 50% by the end of GD1
- Improve our performance against the Guaranteed Standards of Performance over GD1

Some of the costs associated specifically with delivering the stakeholder engagement programme, the new operating model and improvements in customer service are embedded in controllable operational and support costs e.g. for depots and customer facing activities such as connections, emergency response and repair, replacement expenditure etc. or embedded in our corporate IT and people investment plans.

Overall customer service expenditure over RIIO-GD1 is broadly in line with expenditure forecast for the last year of the current price control period. Specific areas of incremental investment identified over RIIO-GD1 include investment of £0.9m pa on customer liaison and management and £0.3m on property (where depot facilities need to be provided for customer service activities). Further details are set out in this Chapter, Chapter 8, Chapter 9 and Appendix P.

5.1 Introduction

Our company vision is to be the leading network operator in the UK. In order to achieve this we need to provide excellent customer service. Historically we have monitored our performance, customer expectations and areas requiring improvement through customer satisfaction surveys, Gas (Standards of Performance) Regulations and Licence obligations.

- Customer satisfaction surveys are carried out by all GDNs; the format and activities covered are set by Ofgem and focus on core activities such as planned interruptions; unplanned supply interruptions or emergencies; and connections work. They allow Ofgem to draw comparisons between GDNs (see Appendix L).
- Gas (Standards of Performance) Regulations set legally binding standards that we are required to meet. If we fail to meet the standard we have to pay customers compensation.
- Standards are supplemented by additional obligations set out in our licence.

While these sources continue to be valuable, we recognise under RIIO we need to do more. Our stakeholder engagement programme (particularly the Live Event and customer focus groups held earlier this year) has been instrumental in providing more targeted customer feedback on areas for improvement and priorities. It has helped shape our stakeholder engagement strategy, our customer service strategy and investment plans for GD1.

As a caring and responsible network operator we also believe it is important to take into account the needs and expectations of the communities we serve. Our Business Plan includes proposals that will have a positive impact on local communities.

5.2 Customer Service Strategy

Our customer service strategy for GD1 is to continue to use all forms of customer feedback to target investment at services that our customers value most and where our customers have indicated we need to improve. Key priorities will be improved communication and greater focus on front line staff responding to issues and concerns at the point of contact, as and when issues arise. This will ensure we meet their needs and priorities. Through a revised operating model for 2013 we plan to deliver the following benefits:

- Customer satisfaction scores of 9 out of 10 by the end of GD1,
- Reduce customer complaints by 30% by the end of GD1,
- Reduce referrals to the Ombudsman by 50% by the end of GD1,
- Improve our performance against the Guaranteed Standards of Performance over GD1 and
- Deliver a robust ongoing stakeholder engagement programme for GD1.

Our executive team will lead and support this strategy but it will be our front line staff and managers who will deliver improvement plans.

Investment

Customer service support is provided as a corporate function across the whole of SGN. Most costs are embedded in controllable operational and support costs across the regional depots and business areas or in corporate IT and people investment plans. Further details of these plans can be found in Chapter 8, Chapter 9 and Appendix P. Specific areas of incremental investment required in relation to customer service over RIIO-GD1 include investment of £0.9m pa on customer liaison activities and management. A further £0.3m pa is required on property to provide customer service facilities for front line staff as greater focus will be given to front line staff responding to issues and concerns.

Customer Service Initiatives

We plan to deliver our strategy and improve customer service by implementing a range of initiatives as set out below:

• Customer Service Centre

SGN runs a central Customer Service Centre for Scotland and Southern Gas Networks. The Customer Service Centre is based in Perth but out of hours support is provided by our dispatch centre in Portsmouth. Southern Gas Networks receives around 12,000 calls per month from customers enquiring about predominantly emergency, planned and connections activities.

We are the only GDN to take our own enquiry calls instead of using the National Grid call handling facility. Like other GDNs we still have to manage calls against a licence standard that requires us to ensure 90% of calls are handled within 30 seconds. Our overall performance against this standard was 93.23% in 2010-11, compared to the industry performance of 90.52% (see Appendix L).

Our customers have told us they value this service and expect us to be available whenever they need our support and assistance during our essential works. As such we will continue to operate our Customer Service Centre 24 hours a day, 365 days a year at a cost that is in line with the last year of the current price control period. This will continue to be the first point of contact for new enquiries. It will also manage and respond to escalated enquiries and complaints.

• Staff Training and Support

Through our stakeholder engagement programme, our customers told us they prefer to talk to someone who knows and understands their job, who takes responsibility and feels empowered to deal with their concerns or needs. They also prefer to have a consistent point of contact. In response to this feedback greater focus will be given to front line staff responding to issues and concerns at the point of contact, as and when issues arise. They will be supported by the Customer Service Centre. We will invest in training for frontline staff and carry out continual assessment to ensure they are equipped with the appropriate tools, training and knowledge to deliver the service our customers expect. This will be delivered through initiatives listed below.

Commitment Based Management Programme

It is evident from the research we have carried out that Commitment Based Management is used in many successful organisations. We plan to implement a programme over GD1 that will ensure greater engagement with our customers. We plan to ask our customers for their views on the work we carry out. With our customers' permission all employees involved in the customer experience will then listen to their customers' views in learning teams and take away improvements that can be implemented locally and rolled out across the company to improve performance. Further details of our approach are summarised in Appendix L.

Achieving Customer Excellence (ACE) Training

Behavioural training for all front line staff will be delivered as part of our new staff induction programme. This training will ensure all staff dealing with customers will be equipped to demonstrate the right behaviours, to treat our customers as individuals, listen to and understand their needs and be able to discuss and offer appropriate solutions to resolve their issues. Our customer service team will work with all teams to ensure support is provided.

• Institute of Customer Service (ICS)

In May this year we joined the Institute of Customer Service (ICS). This means we will be benchmarked against the UK customer satisfaction business index and find out how we perform relative to other private and public sector organisations such as AVIVA, BMW, M&S, Yorkshire Water, ASDA and many more. The results of this will be used to inform our ongoing customer service action plan and enable us to reach recognised national customer service standards. Our ultimate goal is to be awarded the ICS service mark accreditation for customer service. Being members of the ICS also offers us a comprehensive range of knowledge,

training and support facilities. We plan to work in conjunction with the ICS to implement "Drive Service Excellence" training.

• Customer Surveys and Courtesy Calls

We previously carried out monthly telephone surveys in addition to the statutory quarterly postal surveys required by Ofgem to assess our performance in relation to our core activities down to local geographical or depot level. For low volume work activities such as connections it was sometimes difficult to achieve the response rates required to draw informed conclusions about customer needs and performance, particularly on a geographical basis. Following discussions with an independent expert, stakeholders, other GDNs and Ofgem we initiated a trial in Q4 2010-11 which involves monthly postal Ofgem surveys, scaled to produce scores across all our geographical depots. The response has been extremely encouraging. Our return rate has quadrupled and we are now receiving some very valuable comments about the service we provide from a wide cross section of our customers. This has given us a more representative view of the quality of service we deliver and areas for improvement. We hope it will also help us build up a picture of different customer expectations in different locations, particularly the South East LDZ and London area. It is also more efficient and has helped to marginally reduce costs associated with carrying out surveys. Over RIIO-GD1 we should be able to develop improvement plans using survey results to address specific scores by work type and geographic area.

• Customer Charter

Following research and benchmarking with the service and utility sectors with companies including SSE and RBS we plan to implement a Customer Charter detailing our promises regarding:

- When we attend an emergency
- How we plan and execute mains replacement work
- Requests for a new gas connection or alteration to a supply

Our charter will be built around our customers' expectations and will ensure we keep the customer at the centre of everything we do. It will be linked to our Complaints Handling Procedure and Standards of Service. All customer-facing staff will be accountable and performance will be managed to deliver against the charter promises. These promises will set out our quality standards in relation to the service we provide, the advice we give, our communication and the quality of work we carry out. Quality standards will be measured down to team level.

• Communication

Feedback from all our stakeholders, including consumer groups, gas shippers, gas suppliers and our end customers shows they are keen that we share information with them, but they want choice in the way we communicate. They also expect us to embrace new technology. As a result we plan to:

- Make more static and dynamic information available on our website e.g. "film clips" showing customers what to expect during mains replacement work and information on all current replacement projects.
- Provide on line connections services, including application, quotation, payment and planning options.
- Make use of text and other forms of electronic messaging and communication for emergency, replacement and connections work to keep our customers informed.

Details of expenditure are set out in Chapter 9. However benefits and outputs will be measured through improved customer satisfaction and reduced complaints.

• Complaints Management

At present we manage and report on complaints against the Guaranteed Standards of Performance. In the last reporting year we received 1445 reportable complaints (under Guaranteed Standard 14) in the Southern Gas Network area and failed to respond to 1 within the timescale set under the standard. This volume of reportable complaints was down 28% compared with the previous year (see Appendix L).

We plan to continue to record and report all complaints we receive and comply with the new complaint handling standards. We will review complaints to identify what we could do better and what we need to change to avoid complaints happening again. There will be greater accountability at local depot and team level. In response to stakeholder feedback this should also help us deal with complaints promptly and more efficiency at the point of contact with the customer. We want to prevent customers having to escalate matters e.g. to the Ombudsman.

We also plan to:

- Change our processes to reduce the number of times a complaint is passed on to be dealt with internally by promoting accountability at local level.
- Tackle the root cause of complaints by working to develop and implement best practices at local level and across the network.
- Offering resolutions at first contact.

These specific initiatives should help us achieve our goals of reducing the number of complaints and referrals to the Ombudsman.

• Customer Performance Measurement and Key Performance Indicators (KPIs)

To ensure we deliver improvements across all our network area we will set targets and measure our performance down to individual team level. As such our plan includes proposals to develop and implement KPIs for customer service delivery and provide visibility of performance at all levels e.g. through management reports. Following consultation with our staff we also plan to make more information available to them on customer satisfaction scores, our performance, standards of service and complaints.

Justification and Benefits

We have carried out extensive research, stakeholder engagement and some benchmarking over the last year to get views on the services we provide and customers' expectations in all aspects of our business, particularly the customer facing activities. We have also consulted independent experts to get advice on variations in expectations in specific locations. Chapter 9 sets out details regarding the higher expectations experienced in the South East LDZ and London area.

We believe the initiatives we have detailed above are the most cost effective way for us to deliver the improvements in service our customers expect down to distinct geographical areas. The benefits will be demonstrated and measured through:

- Overall customer satisfaction scores
- The level of customer complaints
- Referrals to the Ombudsman and
- Our performance against the Guaranteed Standards of Performance

We will continue to monitor our customers' views and expectations through our customer satisfaction surveys and stakeholder engagement programme to ensure we continue to meet their needs into the long term.

Assessment of Alternatives to Investment

All our suggestions to improve the customer experience have been evaluated on a cost/benefit basis. We considered a number of additional activities to help improve our customer experience but they were discounted as the cost outweighed the benefit and more efficient alternatives were found. For instance, we considered carrying out internal telephone satisfaction surveys to provide satisfaction scores by depot and to highlight hotspots and best practice. This proposal was not pursued as discussions with our market research provider identified that moving to monthly telephone surveys for our regulated customer satisfaction surveys would allow us to achieve this and be more efficient. It would also avoid duplication.

We also considered providing all our forms in Braille but demand for this service was found to be low and the cost could not be justified. As an alternative, Braille translation will be provided on request.

Uncertainties

A number of initiatives are still being trialled and developed with Ofgem and other GDNs. Draft guidance for customer satisfaction and complaints measurement has been agreed by Ofgem and all GDNs but trials will not be completed until 31 March 2012. There is still a great deal of uncertainty regarding our performance against these new measures and where baselines will be set. In the meantime we continue to work with Ofgem and the other GDNs to develop the detail. We have set out below some of the key uncertainties that could still influence our final plans:

- Target for Overall Customer Satisfaction – This will be set using data on actual performance of all GDNs over the 6 month trial period from 1 October 2011 to 31 March 2012. To ensure we are in the upper quartile of performance and can deliver our goal of being the leading network operator we may need to amend our strategy and target to deliver a customer satisfaction score of 9 out of 10 or above the upper quartile average.
- Rewards - The scale of rewards and penalties for customer satisfaction has been set by Ofgem at +/-0.5% of total allowed revenue. However, individual company rewards or penalties will be set on a sliding scale basis. The details of the sliding scale mechanism have still to be agreed.
- Changes to questions – The existing questions in our customer satisfaction surveys have been reviewed by Ofgem and all GDNs. Amendments and additions have been made to ensure the surveys reflect our customers' views in the areas we believe from stakeholder engagement are important to them. There are two extra questions on site tidiness and quality of reinstatement. We are uncertain how this will affect our overall customer satisfaction scores.
- Weighting of Survey Results - At present the survey results for emergency, replacement and connections are weighted equally. During the trial period this weighting will be reviewed to ensure the overall score is more representative of work volumes. Again this could affect our performance and the work we need to do to deliver our targets.
- Effect of use of overall customer satisfaction question - Historically our scores have been based on an average of all questions asked on each survey. During the trial an overall customer satisfaction question will be asked and the score from this question will be the one measured against the baseline to determine whether we receive a reward or penalty. We are unclear how customers will react to an overall satisfaction question as this has not been used before.
- Penalty for Complaints – Ofgem has determined that a penalty of up to 0.5% of allowed revenue could be levied on companies. We believe this will be determined by comparing individual company performance against the industry upper quartile average. It is not clear at this stage if a minimum performance level will be set or what the upper quartile will be. This is currently being trialled and results will not be known until the end of May 2012. Similar to above for customer satisfaction, there will also be a sliding scale mechanism and weightings for individual elements of performance measures. At present they are also unknown.

Stakeholder Engagement

Full details of our stakeholder engagement strategy and events to date are set out in Chapter 2 and Appendix D but throughout this chapter we have referred to initiatives that we plan to take forward to deliver specific benefits in relation to customer service. These improvements and initiatives are the result of the full range of stakeholder engagement activities undertaken over the last year, particularly the "Live Event" and our customer focus groups. Proposals have been developed and tested through the various phases of our stakeholder programme. We are confident that we have identified initiatives that will provide the services customers in the Southern Gas Network area have told us they value. We are also confident that they take account of urban issues and expectations, particularly in the London area.

Our customers have told us value for money is important to them. As investment is broadly in line with forecast expenditure in the last year of this current price control review we believe the additional benefits we plan to deliver will provide good value for money.

We will continue to monitor our stakeholders' views and expectations through our customer satisfaction surveys and stakeholder engagement programme to ensure we continue to meet their needs into the long term.

Social Obligations and Innovations

We believe part of delivering excellent customer service involves being aware of and meeting social responsibilities. We want to make sure we are able to identify and develop additional services that will help and support our customers and communities, particularly the most vulnerable. Through our stakeholder engagement programme we have identified an innovation that would make use of expert customer service staff down time. Staff could make proactive outbound calls to make customers aware of services that are available for priority and vulnerable customers, energy efficiency, energy assistance and to improve CO awareness. This innovation will be piloted once the customer service broad measure trials have been completed and our new operating model implemented. We are keen to make sure full use is made of front line staff customer contact to identify customers potentially requiring advice, support or assistance. Through our stakeholder engagement programme and September 2011 consultation, some gas shippers and energy charities noted an interest in this initiative.

5.3 Enduring Stakeholder Engagement Strategy

We have been extremely encouraged by the level of interest and participation in our stakeholder engagement programme to date. The level of participation has been beyond our original expectations as has the level and quality of feedback received. Our enduring stakeholder engagement programme builds on this and the lessons learned.

Our Strategy

We plan to retain our current strategy, to proactively engage with a wide cross section of stakeholders on an ongoing basis on all the key areas of activity to:

- inform the development of our future Business Plans,
- continuously test our views, assumptions and performance,
- ensure our plans and activities remain aligned to our customers' needs and
- provide long term value for money.

In applying this strategy we will also continue to follow our existing principles:

Inclusive – We will aim to identify and engage with all stakeholders, seeking views, developing ideas, identifying alternatives and establishing priorities.

Targeted – We will target stakeholders with relevant knowledge and expertise to maximise input and efficiency of the process.

Informed – We will be open and transparent, providing stakeholders with the information they need to help them form their views and contribute to discussions.

Accessible – Acting on stakeholder feedback we will continue to use various forms of engagement e.g. questionnaires, focus groups, bilateral meetings, consultations etc. to ensure our programme is as inclusive as possible. The form of engagement will also be tailored to the subject matter.

New Initiatives

Specific new initiatives that we plan to implement going forward include the following:

- Ofgem Customer Satisfaction Surveys – As set out above, they will be carried out more frequently. Sample sizes and return rates will be increased making results more meaningful. We plan to analyse results down to distinct geographical area to help us identify issues which are important to customers and improvements that are required.
- Consumer Panel – We have appointed an independent expert to set up a consumer panel which will allow us to carry out telephone surveys with customers in our network area on a regular basis and quickly obtain views on specific areas of work; test proposals or new initiatives.
- Email and website questionnaires and feedback – From the engagement we have carried out we have identified this is the most effective way to communicate with all our customers and stakeholders, receive feedback in a timely manner and in meaningful volumes. Our stakeholders have told us that overall this is their preferred means of communication and we plan to make full use of it. We will ensure all our stakeholders remain informed and are able to interact with us at any time via our website.

Details of these new initiatives and other areas of focus for our ongoing engagement programme over RIIO-GD1 are set out in Appendix D.

Investment

We plan to deliver our ongoing stakeholder engagement programme without any specific new funding. Our expectation is that our activities and any additional expenditure will be fully recognised and rewarded through the stakeholder engagement reward and incentive package proposed by Ofgem.

5.4 Raising Customer Awareness of Carbon Monoxide Poisoning

Introduction

Carbon monoxide can kill or cause serious injury. Public awareness and understanding of the risks are low, despite the number of fatalities from carbon monoxide poisoning being higher than deaths from natural gas incidents each year.

We and our stakeholders believe we can and should do more over RIIO-GD1 to raise customer awareness of the dangers of carbon monoxide. We have been at the forefront in developing initiatives to combat the dangers of carbon monoxide. We have been actively involved in an Ofgem working group on this important topic, we have assessed the practicality of using atmosphere testing equipment and we have sought the views of our stakeholders on what our role should be.

Our proposal, strongly supported by stakeholder feedback, is to focus on raising awareness. We do not seek a specific allowance for our activities but we have developed an incentive mechanism to reward GDNs for actively seeking to raise the awareness of the dangers of carbon monoxide in a measurable and sustainable way. We believe we can deliver real and sustainable improvements in public understanding and awareness and as a result reduce the number of incidents associated with carbon monoxide poisoning.

Background

Each year in the UK carbon monoxide poisoning is the cause of fatalities and serious injuries at home and in industrial premises. Carbon monoxide is a product of incomplete combustion of any fossil fuel (wood, coal, oil, gas etc). Incidents associated with natural gas appliances are part of the overall total incidents in the UK. However, if gas appliances are properly installed, maintained and inspected these injuries and fatalities can be prevented.

GDNs are required by the Gas Safety (Management) Regulations 1996 and various licence conditions to respond to gas emergencies, including reports of suspected carbon monoxide spillage from gas appliances. Reports of suspected carbon monoxide spillage are usually triggered by carbon monoxide alarms or symptoms of carbon monoxide poisoning. Our First Call Operatives (FCOs) are required to carry out a visual assessment of gas appliances e.g. flame picture, signs of spillage, unsafe exhaust flues and signs of appliance distress. The gas safe / unsafe situation procedures prescribe what action is necessary according to the circumstances e.g. disconnect appliances / isolate the gas installation. Our meter workers are also required to carry out a 'visual only' assessment of gas appliances when doing 'turn on and test' following any meter or downstream installation work or re-commissioning of gas services.

GDN initiatives around carbon monoxide

As part of the price control review process, Ofgem established a working group to review and develop GDN initiatives on raising awareness of the dangers of carbon monoxide and we have been proactive members of this group. It is fair to say that the main focus of the group has been extending the population of carbon monoxide alarms to specific gas user groups, such as 'vulnerable' people.

We are absolutely committed to doing more to raise awareness of the dangers of carbon monoxide with gas users, and have taken an industry lead in this area in this price control period. However, the work we have done leads us to the conclusion that the targeted issuing of carbon monoxide alarms is unlikely to significantly improve public safety.

An important initiative that we have implemented is to issue personal atmosphere alarm monitors (PAMs) to our workforce. Our First Call Operatives (FCOs) carry PAMs that, among other gases, detect carbon monoxide in the general atmosphere. It is important to note that whilst the primary function of PAMs is to enhance the personal safety of our workforce: they have detected carbon monoxide in gas users premises on more than 119 occasions across SGN (between January 2009 and November 2011]), leading to prompt action by the operative to safeguard the gas user and their families. SGN has promoted the use of PAMs with other GDNs through the carbon monoxide safety working group.

In addition to the above, we suggested that a feasibility study could be undertaken by each of the GDNs to determine if the procedure for attending gas emergencies could be improved by using atmosphere testing equipment to detect carbon monoxide spillage in the immediate vicinity of gas appliances. (It must be emphasised that this would not constitute full atmospheric testing, which is a long and complex process). Unfortunately, our initial assessment of such an initiative indicates that the cost and consequential impact is likely to be significant and will far outweigh any benefits. Furthermore, our stakeholders' views are that a GDN's responsibility should extend no further than raising public awareness of the dangers of carbon monoxide.

Stakeholder engagement

We discussed the issues around carbon monoxide at a number of stakeholder engagement events. Stakeholders have included shippers, suppliers, consumers groups, carbon monoxide charities and employees. The role of GDNs on carbon monoxide safety was a specific agenda item at our 'Stakeholder Live' event. In summary our stakeholders have:

- Been very supportive of GDNs doing more to raise awareness of the dangers of carbon monoxide safety.
- Not supported the development of the role of GDNs to undertake assessment of appliance safety using atmosphere testing equipment, or to do more when attending emergencies. Indeed some informed stakeholders stated categorically that they do not support any initiative for GDNs to carry out atmosphere testing or appliance testing; and
- In general, not been supportive of GDNs issuing carbon monoxide alarms.

Our proposal

Following stakeholder feedback we propose to do more to raise awareness of the dangers of carbon monoxide, providing an essential benefit to our customers and the general public. We will do this directly using existing FCOs and meter workers when attending gas users' premises by providing information and discussing the risks and precautions to prevent carbon monoxide poisoning. We will also do this indirectly through awareness advertising and other general awareness campaigns e.g. at schools.

Our FCOs and meter workers will be trained to provide advice to gas users, and improved leaflet information will be provided. In general, this information and advice will be provided when attending domestic premises.

Proposed incentive

Whilst there is no direct investment requirement for this initiative we propose an "awareness" incentive. The baseline awareness for the incentive will be set through an independent survey of an agreed sample of domestic customers, carried out during 2012/13. The survey will then be repeated annually to measure the change in awareness of CO with the participants.

The range of activities to raise awareness will include:

- advising customers during our works (emergency, connections and mains replacement)
- school visits
- local targeted events
- link to fuel poor / vulnerable customers
- working in partnership with carbon monoxide groups and local authorities
- advertising

Incentive payments / rewards proposed are up to a maximum of 0.25% of allowed revenue each year. This will be based on:

- The level of improved awareness of carbon monoxide and the dangers across the range of activity with a particular bias towards the most vulnerable.
- The level of GDN engagement in activities such as school visits, local events, working with groups etc.

Further detail on this incentive is provided in Appendix E.

Justification and Benefits

We believe face to face contact with our customers in their own premises, in particular the vulnerable, will be more effective and have a far greater benefit in raising the awareness of the dangers of carbon monoxide and how to prevent harm than simply leaving leaflets or issuing alarms.

The average time for attending first call emergencies is currently 47 minutes. It is estimated that an FCO would spend approximately 10 minutes having a high quality, situational based discussion with a domestic customer to raise their awareness of the dangers of carbon monoxide and provide advice on preventative measures. A situational based discussion would take account of the customer's dwelling and appliances, rather than simply providing generic advice and issuing a leaflet to the customer.

During high emergency workload periods (generally seasonal) the quality based discussions with an FCO would need to be suspended but in such situations we would still endeavour to target those who we believe would most benefit e.g. vulnerable customers and a leaflet will be provided as a minimum. Also, we will extend this initiative to non-emergency work that is undertaken in domestic customers' premises and undertake other non-direct initiatives to promote carbon monoxide safety. This will include advertising, signage on the company's vehicle fleet and supporting educational initiatives in schools.

The key benefits of these initiatives will be that customers will better understand the dangers of carbon monoxide and what presents that danger in their individual homes. Most importantly, customers will be made aware of what action they can take to prevent carbon monoxide poisoning. We believe that simply leaving information with customers has a low impact and benefit, but explaining the issues and relating them to the customer's specific circumstances will have a much higher safety and social responsibility benefit and will engender the right behaviour.

Providing Connections to Our Network

Summary

We are proposing to invest a total of £46.4m over RIIO-GD1 undertaking new gas connections supported by the domestic load connections allowance and providing the improvements in service that our customers and other stakeholders have told us they value. This investment is in line with our investment under the current price control.

We plan to ensure our performance against each of the Gas Standards of Performance exceeds the industry average and obtains frontier performance in terms of overall customer satisfaction in connections. The initiatives we plan to introduce, particularly to improve communication, should also help reduce complaints and referrals to the Ombudsman.

We plan to invest a further £22.1m to connect 9,000 customers through our assisted connections programme during GD1.

6.1 Introduction

The gas connections market has been open to competition since 1998. Customers looking for a new or modified gas connection can either contact their GDN operator or an accredited independent Utility Infrastructure Provider (UIP). In the case of multiple connections e.g. new housing estates, customers can approach a licensed independent Gas Transporter (iGT) to install, own and operate assets to connect to the local gas distribution network.

We believe competition in the gas connections market is now well established. Ofgem's March 2011 Connection Industry Review showed that for the second year running the market share of third parties exceeded that of GDNs. Third party market share in 2009/10 was 59%. This was against a backdrop of difficult economic conditions and a 24% reduction in total gas connections compared with the previous year.

6.2 New Gas Connections and Service Alterations

Investment

In 2009/10 159,000 new and modified gas connections were undertaken by GDNs and iGTs. Our share of this market was around 10.5% (16,612). While we believe our market share has stabilised at this level the volume of connections work has continued to decline over 2010/11 as a result of difficult economic conditions. Following discussions with our customers and stakeholders, particularly local authorities and developers, we expect this trend to continue in to the first year of GD1. However, our base case assumes some growth will gradually return in 2014/15 and 2015/16 before flattening off for the rest of the RIIO-GD1 period. Our main area of activity will continue to be providing connections for businesses and new connections or service alterations to domestic premises. We plan to invest £46.4m over RIIO-GD1 undertaking this work and providing improvements in customer service.

Output and Historical Performance

While customers are benefiting from increased competition for new connections and service alterations through greater choice, lower prices and improved service, GDNs are still required to meet standards of performance introduced through the Gas (Standards of Performance) Regulations and through our licence. These standards relate to the provision of a quotation, the accuracy of the quotation, providing a date that suits the customer for completing works and carrying out work within the agreed timescales. In the 2009/10 Connections Industry Review, Ofgem noted that GDN performance against the standards was generally good. Our performance against each of the standards met or exceeded the industry average for the two years reported of this price control period (2007/08 and 2008/09). Our stakeholders told us they have benefited from these standards and would like them to continue throughout RIIO-GD1. As such we will continue to measure our performance against these standards, the overall customer satisfaction score and the number of complaints and referrals to the Ombudsman.

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We also actively promote the customer's option to 'shop around'. Reference is made to the Gas Industry Registration Scheme, reached via 'www.lloydsregister.co.uk' website, at various stages of our customer enquiry process. By proactively highlighting this we ensure customers are fully informed of options available to them. Our connections business is also underpinned by our commitment to quality and our certification against the Quality Management System ISO9001:2008. Both initiatives will be maintained in RIIO-GD1 but we want to improve on the progress we have made since in-sourcing our connections work.

Stakeholder Engagement

We have consulted our customers and other stakeholders and listened to their comments and suggestions. Feedback from various events, particularly our "Live Event", staff engagement programme, customer focus groups and our on line survey assured us there is a need for us to continue to offer a full range of connections services. It is also fundamental in developing a sustainable connections business. Our customers told us they want us to continue to compete for market share in all of the market sectors in which we currently operate but they would like us to provide a more seamless, transparent and efficient service. In particular, they expect us to embrace technology and improve communications. They said they want us to communicate in a way that is more efficient and convenient for them. We believe this will provide improvements in service and in the longer term improve the efficiency of our activities.

We plan to deliver improvements in service by implementing the following initiatives over RIIO-GD1, as suggested by our stakeholders:

- Improve communications in advance of carrying our work to help customers better understand the connections process and timescales
- Provide quotations quicker and in different formats that are more accessible and convenient for our customers
- Keep our promise and deliver connections to timescales required by customers
- Keep customers up to date with progress and developments at all stages of work

Justification and Benefits

Respondents to our preliminary stakeholder consultation told us our performance was important to them. As a result we are targeting improvements in performance against the Gas Standards of Performance for connections to ensure we exceed the industry average by the end of the GD1 period and obtain frontier performance in terms of overall customer satisfaction for connections.

To improve performance and communications we are looking to introduce a Connections Charter to help customers understand the connections process and timescales. This will set out what they can expect from our connections teams.

We also plan to implement an on-line internet system for providing quotations, making payment and tracking jobs, together with an e-mail and/or text update system. Through these initiatives we hope to improve communication and our performance against the Gas Standards of Performance and overall customer satisfaction

It is our intention to offer the following services throughout GD1:

- New gas supply – we will continue to offer small and large-scale connections to the gas network for new or existing housing and for industrial and commercial customers. We forecast we will invest approximately £13.9m per annum connecting on average 6,300 new customers to the network each year (£8.1m funded by customers).
- Alteration/upgrade to existing gas service – if a customer wants to move their gas meter or increase their gas consumption, we will offer to alter or upgrade their service. We forecast will invest approximately £4.6m per annum over GD1 providing this service (this is fully funded by customers).
- Modifying ECVs – we recognise our social responsibility to ensure our more vulnerable and less mobile customers are able to access their Emergency Control Valve to isolate their gas supply if necessary. We forecast we will need to spend approximately £0.2m per annum modifying ECVs for safety reasons.

- Infrastructure projects – we have the capability to deliver new individual services to very large infrastructure projects (for example, at new housing developments) to meet the needs of our customers. We forecast we will be working on over 200 new projects, investing approximately £3.8m per year in new infrastructure projects over the period (this is fully funded by customers).
- Service isolations – where a gas supply is no longer required, for example where a property is being demolished or rebuilt, we offer an isolation service to disconnect the existing gas service at the main. We forecast we will invest approximately £0.85m per annum over GD1 providing this service (this is fully funded by customers).
- New mains extensions into 'off network' locations – even if a property is in an area where there is no existing gas supply, we will be happy to discuss the option of providing gas from our network to individual neighbourhoods. From stakeholder feedback we forecast we will be invest approximately £0.1m over GD1 providing this service (this is fully funded by customers).
- Investment in our IT systems – to provide an on-line internet based system for providing quotations, making payment and tracking jobs we forecast we will spend approximately £0.52m in the first few years of GD1 on our IT systems. This investment is embedded in the IT investment plans in Chapter 9 and Appendix P.

Uncertainties

There is still a great deal of uncertainty regarding the timing and extent of economic recovery. This has an impact on the volume of connection work likely to be required over GD1. As a result we developed low, medium and high case scenarios that show different levels of recovery. The low case assumes growth will be relatively flat over the next decade and the high case assumes more rapid recovery and greater growth. Following discussions with our stakeholders we do not believe either case is realistic. Our forecasts have been developed around the median which assumes some recovery in 2014/15 and 2015/16 then fairly flat growth over the remaining GD1 period.

6.3 Assisted Connections Programme (Fuel Poor)

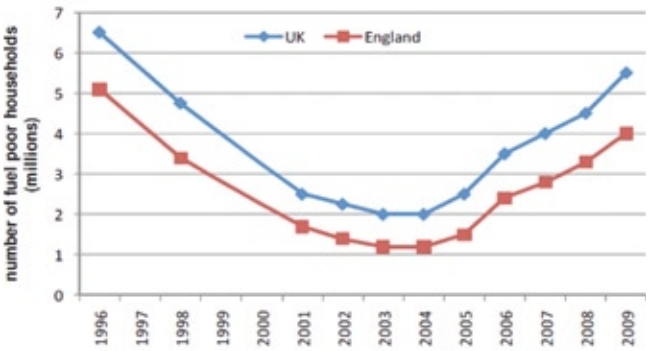
Introduction

As a socially responsible company, we have worked over the past 3 years with local authorities and housing associations to connect vulnerable and fuel poor customers (spending more than 10% of their income to stay warm) to ensure they have access to efficient and affordable energy sources. Up to March 2011 we had connected 1,200 households in the Southern Gas Network area. We hope to have connected 2,000 by the end of March 2013.

Going forward into GD1, we are planning to invest £22.1m connecting a further 9,000 households to the gas network, helping them to reduce their energy costs and in some cases removing them from fuel poverty.

Background

The following chart shows how many households in the UK and England were living in fuel poverty between 1996 and 2009.[1]



[1]www.decc.gov.uk/assets/decc/Statistics/fuelpoverty/2203-pn062.pdf

As set out in the table below, of the 5million households thought to be located in the Southern Gas Network area, approximately 68,000 are estimated to have no gas supply and be in fuel poverty.

	Households located in our network area	Households in our network area with no gas supply	Households in our network area with no gas supply and in fuel poverty
South LDZ	2,179,000	346,000	40,000
South East LDZ	2,857,000	245,000	28,000

As set out above, since 2009 we have been working with third parties to support the principles of the government's 'non gas fuel poor network extension scheme', with the aim of removing 2,000 homes in our network area from fuel poverty status by March 2013. We have been incredibly successful in supporting this initiative and our performance to date has allowed us to connect around 1,500 homes. However, energy prices are rising and the number of households living in fuel poverty is expected to rise again by the end of this year. If this trend continues we estimate there will be over 1.5million households within our network area that qualify as vulnerable or fuel poor by 2021.

Our Plans

We plan to connect a further 9,000 households under our fuel poor network extension programme over RIIO-GD1. We intend to continue to work in partnership with third parties such as local authorities and housing associations to reach those who would most benefit by switching to mains gas as their primary source of heating fuel; gas is recognised as being more affordable and more efficient than other conventional forms of energy for heat such as coal, oil and electricity, saving 30% or more on energy bills.

To further support the government's objectives of removing people from fuel poverty, we intend to develop a process whereby customers would also be encouraged to further investigate alternative solutions and energy efficiency measures (particularly where it is not considered efficient to extend the gas network to their property). This would be done by adding links on our website to agencies that could offer further assistance.

Benefits

By working in partnership with local authorities and social housing bodies we can continue to ensure that in house works are carried out to ensure the full benefits of being connected to the gas network can be realised and customers can be removed from fuel poverty. However, as detailed by Ofgem, a mid point review will be carried out in 2014/15 to allow variations to be made as government policy develops, housing standards change and the emerging Green Deal and Energy Company Obligation policies take effect.

Stakeholder Engagement

At recent stakeholder engagement events our customers and stakeholders were very interested in our work in this area and said they were keen for us to continue to offer this service. They recognised fuel poverty was on the increase and felt it was an important issue, particularly given recent announcements regarding wholesale and retail prices. There were no negative comments or criticism of our work in this area. Indeed stakeholders suggested "Every effort should be made to assist those in any form of poverty" and that generally it was a "good thing and should be supported". In response to our September 2011 consultation one stakeholder congratulated us on our "Assisted Connections Programme" and said "it cannot be emphasised enough what a help this has been to many of our tenants who are unfortunately in a fuel poverty situation". They went on to say "it is no exaggeration to state that in some cases it has transformed tenants' lives, by helping the council to offer modern high efficiency central heating systems".

One stakeholder also suggested it should be tied in to CERT and other campaigns that are out there. We will continue to explore these options over RIIO-GD1 to maximise the efficiency of our programme and customer benefits.

Case Study

AmicusHorizon

AmicusHorizon Ltd is an exempt charity operating as a registered social landlord and regulated by the Tenants Services Authority. Following AmicusHorizon's mission statement "making homes, helping people" it exists to improve the socio-economic circumstances of its residents and the communities it serves across London and the south east.

Jacobs and Ravelin House are two blocks of flats comprising of 37 households. Both lie within an area designated as being within the top 5% of the most deprived locations in England. In terms of providing energy efficient measures, flats can be acknowledged as 'hard to treat' homes. With the need to replace the existing electric storage heaters, we were able to work with AmicusHorizon to bring together a project that saw the installation of gas-fired combination boilers to the flats whilst improving loft insulation and ventilation systems. Alongside the boilers, new thermostatic shower taps were installed to bathrooms to reduce energy and water consumption. With the SAP rating now increased to the flats residents report that the new heating is much better and easier to control. From the combination of measures installed they can now look forward to a more comfortable home with reduced energy bills in the future.

6.4 Embedded Entry

The first biomethane to grid embedded Network Entry Point (NEP) was installed at our pioneering project in Didcot, within the Southern Gas Network area in 2010. This important development has paved the way for the future of renewable gas to grid injection in the UK.

We believe there is significant potential for the development of alternative sources of gas for example from biomethane, coal bed methane and syn gas within our network area. We are forecasting an increased number of enquiries and embedded entry points over the GD1 period.

Figure 1 – Didcot Biomethane Project, Oxfordshire

Investment

During the GD1 period we expect to connect 42 new embedded Network Entry Points to our network, with a total expenditure of £33.6m. As things stand, these costs will be recoverable from the Delivery Facility Operator (DFO), who has to fund all the work associated with the NEP.

Outputs and Historical Performance

We believe such initiatives have an important part to play in the UK energy sector. To help facilitate developments in this area we have supported Ofgem in the development of output measures for embedded Network Entry Points around:

- the provision of timely connections to the network for our distributed gas customers and
- employing standards of service for quotation, planning and completion of the connection.

These standards have still to be finalised but it is Ofgem's intention that they will initially be voluntary, until the market develops and our understanding of the issues involved in connecting such projects improves. Our suggested timescales for the proposed voluntary standards are shown in the following table. They are in line with the other reported connections standards.

Proposed voluntary performance standards for new NEPs for distributed gas

Stage	Proposed Voluntary Standard
Initial Enquiry	GDNs shall respond to an initial enquiry within 15 working days
Feasibility Study Quotation	GDNs shall issue a feasibility study quotation in response to a request within 15 working days.
Feasibility Study Report	GDNs shall issue a feasibility study report within 50 working days.
Issue of Connections Agreement	GDNs shall issue a Connections Agreement within 6 months of the initial enquiry
Offer date for Commencement and Substantial Completion	Where a customer has accepted a Connections Agreement, the GDN shall offer a date for the commencement and substantial completion of work within 20 working days.
Completion Notification	Where substantial completion has taken place, the GDN shall issue a Completion Notification within 15 working days.

Other output measures will be developed and implemented relating to:

- the volume of biomethane connected,
- customer satisfaction and
- ongoing stakeholder engagement throughout the GD1 period and beyond.

Justification

As the UK's own oil and gas resources decline, we become more exposed to high and volatile gas prices and security of supply concerns. By 2020 it is estimated gas import dependency could be 70% or more. At the same time, global demand for gas is increasing. Against this background, we believe we have an obligation to facilitate the connection of alternative sources of gas, particularly renewable sources such as biomethane which would otherwise have been regarded as a waste. This is a view that a number of stakeholders have supported throughout our engagement events, particularly our Live Event and customer focus groups.

We believe over time, as our knowledge and experience develops, innovation will drive the cost of construction and entry down, further facilitating the connection of these alternative sources of gas. Our objective throughout GD1 is to actively pursue the development of technology that will enable lower costs for entry and help stimulate the market. The development work and the knowledge gained will be shared across the industry to ensure the benefits are passed on to all consumers. Our stakeholders have supported this view with some being very clear that they thought we had a role facilitating research and development.

Benefits

We believe the gas network is a key resource that can be fully utilised over the next decade and beyond and help deliver government energy and renewable targets.

As the number of embedded NEPs increase, we believe there will also be additional opportunities e.g. to reduce investment on the gas distribution network by deferring reinforcement as localised gas supplies increase. In addition these entry points will reduce volumes being supplied through the NTS, further reducing NTS investment and operating costs. In the long term, customers will benefit from improved network utilisation and costs associated with gas transportation.

A number of other benefits can be achieved as a result of increased network entry facilities:

- Reduction in shrinkage and greenhouse gas emissions – leakage and emissions associated with transportation from the NTS and down through the distribution system should be reduced as a result of embedded entry
- Resources used to produce gas and energy would otherwise simply be a waste;
- Reduced customer costs – greater utilisation of the existing gas network assets should help reduce costs to customers by spreading the investment that has already been made in the infrastructure over a longer period;
- Customer satisfaction – our stakeholders told us gas is the fuel of choice for many customers, particularly for heat, and is likely to remain so for some time to come. By allowing alternative sources of gas onto the network customers will continue to have access to a flexible and efficient energy source and will be able to continue to use appliances and CHP units;
- UK growth opportunities – generates economic growth through private sector investment in the development and production of alternative gas sources.

Stakeholder Engagement

As set out above and in Appendix D, stakeholders have encouraged us to continue to facilitate the entry of renewable and unconventional gas sources into our network. This has influenced the development of our plan. A stakeholder told us it is “a way of turning methane into something useful”. However some were conscious of current costs and emphasised the need to ensure it was “affordable”. We believe innovation can help drive the cost of construction for an entry point down, and facilitate connection through changes to the way gas quality is monitored.

Stakeholders supported our role in developing the technology to enable lower costs for entry and to stimulate the market. The development work in this field and the knowledge gained needs to be shared across the industry to ensure the benefits are passed on to all customers. The Renewable Energy Association suggested each GDN should be encouraged to do further IFI work but some innovation should be in collaboration with other organisations”.

Stakeholders have also commented that the current financing methodology is a barrier to entry and although the Renewable Heat Incentive subsidises the capital cost of the NEP it still needs significant funding by the Delivery Facility Operator. Our aim would be to help facilitate the market by allowing the cost of the reinforcement, £1.39m, (subject to an economic test) to be funded by the GDN. A number of options are being considered in UNC review group 391; one option would allow gas delivered from embedded NEPs to be treated in the same way as other new connections. However another stakeholder suggested “GDNs need to be incentivised to make available capacity and to support biomethane projects”.

We are also supporting and actively participating in the Energy Markets Issues for Biomethane (EMIB) project. This group has identified the barriers that are slowing down the commercial development of biomethane projects in the UK. The aim of the group is to collaborate and develop ways of overcoming these obstacles. The group will draw its final conclusions early in 2012.

Community and Sustainability

Summary

We are committed to the protection of the environment and delivering sustainable operations. We always consider the impact of our activities in everything we do. Our company values illustrate how we manage our business, not only in an environmentally responsible manner, but also recognising we have a positive role to play in environmental protection and sustainability.

One of our strategic objectives aims to enhance a culture and process to care for the environment and communities we serve. This section of our Business Plan discusses how we intend to minimise leakage from our network, our initiatives to reduce our business carbon footprint (BCF), our proposals for land remediation and other sustainability initiatives.

For an investment of £4m we will improve the gas leakage from our network by either meeting or beating our baseline during GD1.

7.1 Shrinkage / Leakage

Summary

GDNs are incentivised to reduce shrinkage and environmental emissions. Our performance during the current price control period has shown we have consistently outperformed the targets set for us.

During GD1 we will to continue to minimise our shrinkage through investment in the network, taking account of our stakeholders' views to see a reduction in our carbon footprint.

Investment

During GD1 we will invest £4.06m in repairing and maintaining our existing pressure management systems in Southern Gas Network area. The overall impact of this will be to reduce shrinkage by 13.2% from a 2010/11 baseline.

Outputs

Ofgem's proposals for an annual baseline figure for shrinkage are based on the GDN's past performance. Our plan proposes a flatter baseline, based on the 2010/11 Environmental Emissions figure, but taking account of certain factors not previously considered by Ofgem. A fuller explanation is given in Appendix M: Investment to Manage Shrinkage.

Our performance against this baseline will be measured by annually assessing the leakage from our networks and installations such as Above Ground Installations (AGIs) and gas holders.

Historical performance against this baseline is highlighted in Table 1 below.

Table 1 – Past Shrinkage Performance against Baseline

Stage	2008 /09	2009 /10	2010 /11	2011 /12	2012 /13
Baseline (GWh)	776	748	731	713	695
Actual (GWh)	725	689	667	-	-
Outperformance (GWh)	51	59	64	-	-

During the current price control period we have undertaken similar volumes of work and delivered these through the management of resources and skills to ensure a cost efficient performance.

Justification

Our focus will primarily be on maintaining and improving the performance of networks where pressure management and leakage control systems have previously been installed. In our evaluation of such systems we do not require to carry out significant investment in the installation of new pressure controlled equipment.

The investment of £4.06m during GD1 will further develop and refine our pressure management systems in the following areas:

- Targeted annual pressure surveys to assess the performance of our networks.
- Annually re-assess the location of low point monitoring equipment and where necessary install and relocate low points to improve the efficient operation of these networks.
- Update and replace existing pressure management equipment due to obsolescence.

Benefits

It is essential that we continue to maintain and refine the operation of our existing pressure management equipment both during the GD1 period and beyond to further minimise leakage. Enhancements to these systems will ensure our commitment in reducing the environmental impact from emissions and our carbon footprint are achieved.

Assessment of Alternatives to Investment

In our assessment for the level of investment required in GD1 consideration was given to alternative strategies.

One option would be to do nothing. The consequence of this would be a significant overall degradation in the operation of our networks resulting in increased shrinkage. As a prudent gas transporter, we do not consider that this option is in the best interests of our customers.

A further option would be to install remote pressure monitoring equipment on our gas networks. Although this would reduce operating pressures and hence shrinkage, it is inefficient as it does not provide the most appropriate pressure management system for each individual network. Further, at a total cost of £7.8m it is not the most cost effective option available.

We believe that our proposed strategy of determining the most appropriate method of pressure management for each network represents the most efficient level of investment and best value for our customers.

Stakeholder Engagement

Our stakeholder engagement activities, engaging with a wide representation of stakeholder organisations, have identified that our customers want us to look at reducing our carbon footprint.

Comment from SBGI Meeting 20/05/11, subject was Carbon footprint / 5O5 targets.

- *A question was raised regarding carbon impact of shrinkage and support given for replacement programme as it will help to reduce shrinkage.*
- *Support given for our approach and our 5O5 targets.*

7.2 Non-Leakage Business Carbon Footprint

Summary

We will report annually on our CO_2 equivalent emissions, using the agreed framework for reporting BCF.

We will report the carbon emissions related to our business operation in a standard template according to set categories including building energy usage, operational and business transport, fuel combustion and shrinkage.

We will report on all Scope 1 and Scope 2 emissions on an operational control basis, ie those operations where we have full authority to introduce and implement our operating policy. In addition we will report on an identified subset of Scope 3 emissions.

Investment

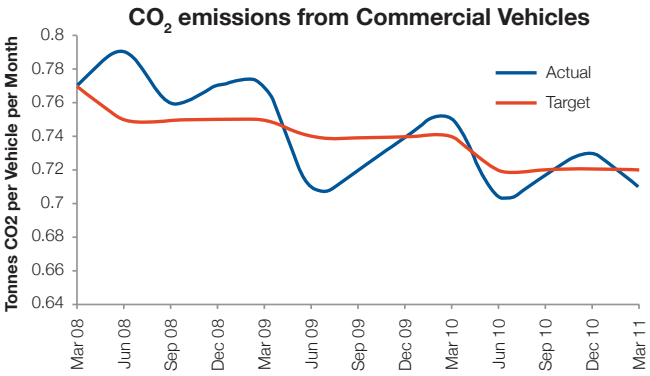
We will continually assess the available building energy reduction technologies with a view to investment. These investments will be in renewable energy technologies designed to reduce our BCF. Any technological solutions chosen will be selected following a critical examination of available alternatives to identify the most suitable site specific systems which will deliver the greatest CO_2 reductions and require the shortest pay back periods.

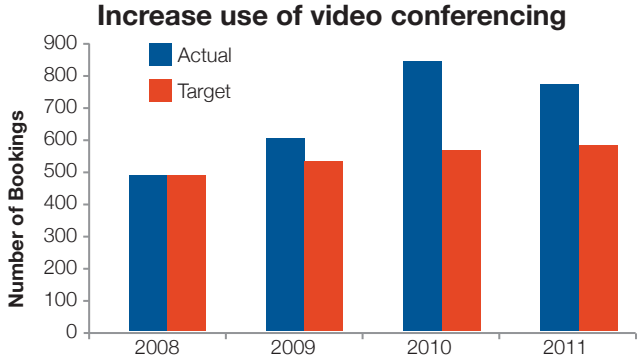
Outputs and Historical Performance

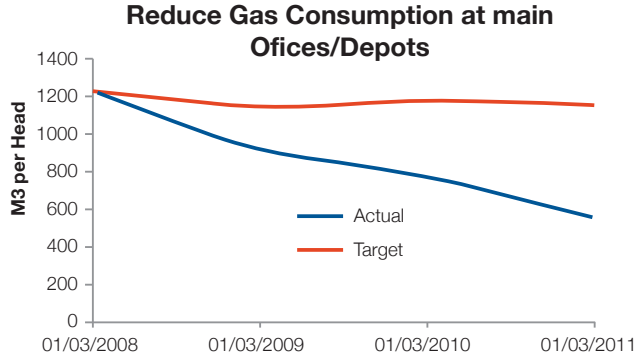
In 2008 we introduced an environmental strategy called 5O5. This is a 5 year, 5 objectives policy aimed at reducing our consumption of resources and improving our carbon performance by means of achieving 15 targets. We are now half way through year 4 and 5O5 has already delivered significant measurable BCF reductions.

As we have already made significant non shrinkage BCF reductions we believe that our base line BCF calculation figure should be greater than that which we will produce for the first year of GD1.

The following charts give a visual representation of the BCF progress for Scotia Gas Networks as a whole, between 2008 and 2011, applicable to certain items that will feature in the BCF template, to March 2011. The first and third diagrams show that we have reduced the BCF elements associated with two of our larger impacts by around 4% and nearly 50% respectively. Our increased use of video conferencing by 59% implicitly indicates that we have reduced the business travel that would previously have been undertaken.







Justification
We are able to generate the required BCF annual reports at minimal additional costs. The investments that we plan to make will save operational costs, reduce indirect emissions and lower our overall BCF.

The Benefits
The reporting process will provide us with an objective measurement system which will allow us to demonstrate, to our stakeholders, that we are proactively introducing measures to reduce our BCF.

The investment opportunities to install renewable energy equipment in our building portfolio could save up to 500 tonnes of CO_2 annually, save operational costs, reduce our overall BCF and that could in turn beneficially impact on our CRC energy efficiency scheme assessment.

Options Considered
The members of the Energy Network Association Environmental Working Group have developed and submitted proposals for the structure and contents of the BCF template.

Stakeholder Support
Our stakeholder events have been well attended and participants have been very positive in their reaction to the way we have monitored, reported and reduced our major environmental impacts.

7.3 Land Portfolio Management

Summary
Our proposal for the RIIO-GD1 period (2013-2021) is to invest £26.2 million to address the statutory, environmental, safety and health risks associated with the historical production, distribution and storage of town gas. Unlike natural gas, which is used in the UK today, town gas was manufactured from coal, a process which produced a number of industrial by-products which are harmful to health and the natural environment. Many of these sites are still used as part of our operational distribution network. Our current land portfolio comprises 122 sites of varying size across southern England, ranging from large former gasworks to very small distribution governor sites.

We have a statutory obligation to ensure that our land does not pose undue risk to the environment or human health. We recognise that in order to meet our statutory obligations we must undertake a planned and pragmatic approach to managing our land portfolio, driven by actual environmental risks and underpinned by sound technical principles. Consequently, our approach is to review the available information and engage with relevant parties to gauge expectations and requirements.

Below-ground tar tank on a former gasworks

Investment
Over the 8 year period (RIIO-GD1) the budget for the management of our land portfolio in southern England, encompassing assessment and remediation of environmental issues, is £26.2 million. The completion of this process, which is supported by the relevant regulatory agencies including local authorities and the Environment Agency (EA), enables us to remove both the societal, environmental and safety risks associated with potential soil and groundwater contamination present across our portfolio and which has the potential to have an adverse effect on both human health and the wider environment.

Historical Performance
During the period from 2006 to 2009 we undertook an information review to ensure our proposals going forward (in the last 2 years of GDPCR1 from 2010 to 2013 and into RIIO-GD1) meet legislative and regulatory requirements and expectations, whilst reflecting a realistic assessment of the potential issues which exist on our sites. These works have focussed on a general assessment of the prevalent conditions across our portfolio, based on existing information. This has allowed us to develop a better understanding of the issues and risks present, identify activities required and engage with our regulators. To the end of GDPCR1 (in 2013) we plan to increase our activities to both investigate and remediate our highest priority sites. As an example, we will be investing in excess of £2.5m to address our statutory liabilities at our Tunbridge Wells and Sutton sites during this period.

Outputs
Our primary output measure will be the number of sites taken off risk. We will measure, review and report the progress of our land management strategy by maintaining a register of sites which have undergone investigation and remediation as necessary.

Justification
In relation to land management there is a range of environmental and development legislation which defines statutory requirements in relation to issues such as protection of human health and the wider environment, management of waste materials and planning of proposed development works. This legislation dictates that we must take appropriate action to manage the risks associated with our land portfolio.

The principal enabling legislation relating to these activities is Part IIA of the Environmental Protection Act 1990 and associated statutory guidance. This provides the regulatory basis for the identification and remediation of statutory designated contaminated land. This legislation dictates that landowners have an obligation to ensure that any conditions present on their sites do not represent a significant risk to the wider environment (principally human health and rivers, streams etc).

Benefits
The key benefit which will be delivered by investment in our land portfolio is the ability to demonstrate to our stakeholders the absence of environmental risks associated with our sites through a process encompassing investigation, monitoring, assessment and remediation, therefore ensuring compliance with UK legislation and providing wider societal benefit.

Alternatives considered
There are no viable alternatives to investment in our land portfolio as a 'do nothing' option would result in us failing to meet our statutory obligations under current legislation. Consideration will be given to determining the most appropriate investment options at each of our sites to ensure factors such as sustainability and cost effectiveness are taken into account on a site by site basis. Assessment options will include:

- No further action (on those sites where no significant risks are identified);
- Monitoring of any existing wells etc remaining at the site and assessment of the results; and/or
- Further investigation and assessment; and/or
- Site remediation works.

On some complex sites the preferred solution may include a combination of the above options.

Uncertainties or sensitivities considered
Uncertainties and sensitivities relating to the overall strategy include:

- Regulatory expectations; and
- Stakeholder concerns (particularly neighbour concerns regarding health risks from contamination).

Stakeholder expectations
The expectations of our stakeholders are fundamental to our approach in relation to the protection of the environment and effective cost management of our activities.

We have carried out a number of approaches over recent years to develop a better understanding of our stakeholders' requirements and expectations. These have included engagement with regulatory bodies (including local authorities and the Environment Agency), consultation events and meetings with adjacent landowners regarding projects both on our own land and on their properties. These approaches have allowed us to develop the following understanding:

- Our stakeholders expect us to manage our land responsibly and undertake land management activities in accordance with UK environmental legislation;
- Our regulatory stakeholders expect proactive engagement with all appropriate regulatory bodies to ensure that our activities are undertaken in accordance with their expectations; and
- Our stakeholders expect all works to be undertaken in line with relevant best-practice to demonstrate that the most effective and innovative approach has been adopted, optimising performance in terms of practicality, sustainability, health and safety, cost, and wider societal benefit.

7.4 Aggregates/Environmental Management System

Summary
We will submit the expected volumes of aggregate extraction and spoil to landfill as part of our Business Plans, and then report on the actual quantity of aggregates used and the annual tonnes of spoil sent to landfill in our annual regulatory return.

We will report annually on the number of non-conformities identified giving full details of any major non-conformances found during our twice annual ISO 14001 independent audit process.

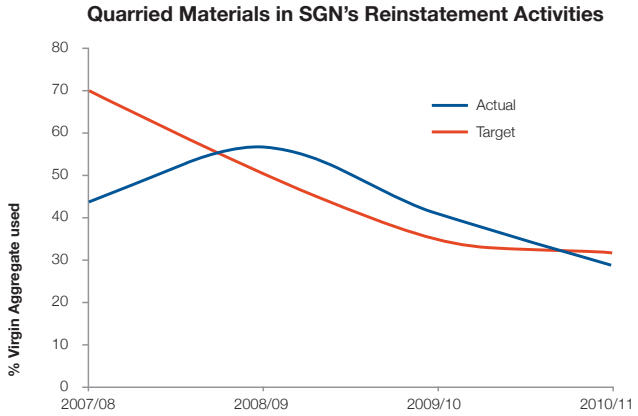
Investment
We will continually assess available technologies which will help us to achieve our continuous improvement in soil extraction reduction and avoidance of spoil to land fill. Any technological solutions chosen will be selected following a critical examination of available alternatives to identify the most suitable site specific systems which will deliver the greatest improvements in our performance.

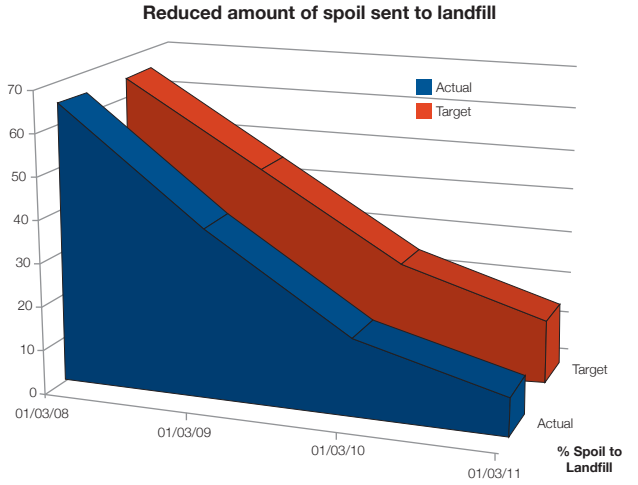
Outputs and Historical Performance

Aggregates

Our 5O5 strategy has 2 specific targets aimed at reducing the percentage of spoil sent to landfill by 10% per annum and reducing the percentage use of virgin aggregate material also by 10% per annum. 5O5 has helped to drive improvements in these areas. We already report on our performance against these targets on a monthly basis.

The following two charts demonstrate the considerable improvements that have been achieved between 2008 and 2011 as a result of our significant focus on project management, our commitment and involvement with the WRAP initiative, and our innovative approach to reinstatement management.





We believe that as we have already made very significant improvements in performance against these two targets we will have less scope, in the future, to make similarly large improvements by the avoidance of waste going to landfill and by maximising our use of recycled back fill material. To avoid us being disadvantaged for our historical and current achievements, and to take account of our consequential limited scope for future improvements, we request that our baseline is set accordingly.

The expected volumes that will be produced during year 2013-14 are as follows:

Company	Volume CuM spoil to landfill	Volume CuM virgin aggregate
Southern Gas Networks	21,264	61,574

ISO 14001

Since we were formed in 2006 we have retained our ISO14001 accreditation with zero non conformances identified. This is due to effective environmental management at all levels within our organisation.

Justification and Benefits

The planned investment will ensure our ongoing effective environmental management, reduction in environmental impacts and demonstration of commitment to sustainable operations. This will enable us to demonstrate to our stakeholders that we are proactively introducing measures that will reduce our BCF and reduce our impact on the environment.

Alternative Options Considered

The actual volume of virgin aggregate and spoil to landfill that we have projected for year 1 of the new regulatory period is based on the mandatory mains replacement programme together with an expected non-mandatory element for Tier 2 and 3 pipeline categories with repairs projected based on expected replacement having been completed. Other expected business case models were considered but the one described was regarded as the most realistic approach to the unknown non-mandatory elements.

Stakeholder Support

Our stakeholder events have been well attended and participants have acknowledged the very great improvements we have made in the areas of spoil to landfill and use of virgin aggregate both in terms of percentage and volume reductions.

People

Summary

Summary

Our people are the primary means by which we achieve our goals. It is through the skills, motivation and continued improvement of our employees that we can deliver our safety, economic, customer service and environmental targets. In essence our people are our greatest assets. We believe that the drivers for better safety, better innovation and other performance improvements expected from the gas distribution industry are still emerging, rather than receding.

To meet these expectations we will need to develop a workforce with different behaviours, higher skill levels and flexibility than has hitherto been necessary. We will provide this resource for an average cost of £4.9m p.a. during GD1. We have targeted ourselves to achieve a 15% saving on the retirement driven manpower replacement.

8.1 Introduction

Our performance throughout the current price control period, achieving our ongoing replacement targets, sustaining safety outputs in emergency and repair through the worst winter conditions in decades, while continually improving efficiency has been as a result of the efforts of our labour resources.

Appendix O provides the detail of our people strategy for GD1. The following provides a high level overview.

8.2 Strategy

Our people strategy is to ensure that we have the right number of people with the right skills, at the right place and at the right time, to do what we want them to do, safely, efficiently and at the right cost. In order to achieve this we must deliver year on year improvements in employee skills, behaviours, capabilities and performance. Our development strategy is a subset of our people strategy and, put simply, is to get our people to offer more of their capability and potential willingly.

We will continue with a focused apprenticeship programme coupled with targeted training for industrial and staff employees to ensure we have the right resource model for the decade ahead. The costs associated with this enhanced programme are an average of £4.9m pa over GD1.

Our workforce will experience higher levels of turnover as the proportion of our employee base nearing retirement age increases. It is also important to recognise that the needs and physical capabilities of individual workers change as they grow older and we will need to adjust their duties accordingly.

We will manage this transition by co-ordinating our general recruitment, apprenticeship, graduate, technical management and training programmes with changes in structure and inter-activity work flexibility. By the end of GD1 over 25% of our work force will have reached retirement age. This retirement profile, coupled with natural turnover, produces the following recruitment and training requirements.

To ensure we have the right skills set through and post GD1 we will attract new employees by means of competitive reward packages and retain people by offering an attractive overall employee proposition. The basic feature of this proposition is a comprehensive mix of direct financial reward through remuneration, (rewarding performance, innovation and flexibility), and provision of numerous benefits that have real and sustainable value to employees, e.g. development opportunity, job satisfaction, recognition, commitment on our part and an overall supportive and attractive environment. Although viewed as qualitative benefits by our staff, provision of them is a direct and continuing financial cost to our company.

We believe this offers us an opportunity to engage new skilled employees with an estimated saving of 15% on current costs. This has been built into our Business Plan assumptions. This is discussed further in Appendix O but there are a number of fundamentally important issues that we have considered, either explicitly or implicitly, in our planning to recruit and retain staff and to reduce the inefficiencies associated with high staff turnover. They are:

- There is a skills shortage in the UK and an ageing working population. The effect of this is, and will increasingly be, to drive competition for scarce human resources and increase reward expectations of the workforce available to us;
- The ageing of our current workforce and the removal of the default retirement age will significantly increase our requirement to adjust duties of manual workers consistent with age-related changes to capacities and physical abilities;
- As the Global and UK economies emerge from recession, staff turnover rates (Churn) are expected to increase. This is particularly relevant to staff working on our mains replacement programme, but also applies to all other areas of our operations;
- New technology will require different and higher levels of skills, which we will need to develop and retain;
- As engineering assets age, the skills and resources needed to maintain, decommission and ultimately dismantle them will change;
- Employment legislation is likely to continue to introduce additional costs as societal expectations increase in respect of working hours, work / life balance, childcare, protection for temporary or contract workers etc.;
- Streetworks legislation is likely to result in changes to working patterns as society becomes less tolerant of works that are perceived to cause congestion and put pedestrians at risk. This will require increased work in ‘unsocial’ hours and will drive up employment costs; and
- Pensions legislation is inevitably going to increase pension costs because of auto-enrolment.

As defined pension benefits recede, new recruits expect to be compensated through higher direct earnings.

Operational Support

Summary

Summary
In GD1 we will continue to manage our Operational Support functions in a way that provides the minimum cost to the customer. We believe this is achieved through our existing model of local Depots supported by common Corporate Services.

Our investment during the GD1 period is focused on improvements in Operational Management and reporting while replacing key non operational assets to ensure that we can continue to provide the high level of service to our Customers. The main areas of our investment will focus on IT, £35.6m, Vehicles, £40.2m, and Property, £16.4m. The justification for and benefits derived from this investment is outlined in the respective sections.

Throughout the RIIO-GD1 period we will continue to incur costs in the operation of our support activities at levels broadly similar to the final year of the current price control.

During the first three years of the current price control we have reduced Work Management costs by approximately £3m. This has been through a combination of in sourcing key services and consolidation of depot management efficiencies. We will continue to provide these services for an average of £23.8m per annum during GD1.

The minimal increase in corporate expenditure reflects the need for Apprenticeship and Training programmes to meet the challenges from rising retirement and associated with specific issues such as Smart Metering competencies. Underlying expenditure remains broadly consistent over GD1. Expenditure is forecast to be on average per year £27.6m.

9.1 Introduction

To offer value for money, much of our operational support is provided as a corporate function across the whole of SGN. Our activities in this important area cover IT provision, transport and plant and other areas of investment such as insurance, property work management and support services. Full details of our operational support investment plans are provided in Appendix P.

9.2 Information Technology Strategy

As indicated above our Information Technology (IT) function provides support across all our business activities. In order to deliver the outputs defined within this Business Plan, during GD1 we will need to spend £201.7m totex on IT and Telecoms across SGN as a whole. Southern Gas Networks' share of this is £35.6m capital expenditure with associated operating costs of £95.6m.

We have recently undertaken extensive industry analysis as well as independent external benchmarking in order to assess and improve our IT efficiency and ensure our prime objective of providing operational excellence through IT reliability and availability is attained and maintained throughout GD1.

At the heart of our IT strategy is the retention and enhancement of our core front office technology solutions which are recognised as being global best in class and industry leaders within their field. Additionally, we will leverage the recent investment in Oracle ERP Technology in supporting our back office functions and the significant investment during the current price control period in our Gas Control System Operations.

All future financial investment (capex and opex) on our IT and Telecoms will be directly attributable to the outputs defined within the IT strategy and the wider business strategy as detailed within this Business Plan.

To this end, our IT strategy is wholly aligned to the primary output measures and the company's strategic objectives. This is discussed further in Appendix P and can be summarised as follows:

1. Our prime objective for IT is to achieve operational excellence.

   Operational excellence = reliability, availability and cost efficiency.

2. Our performance will be regularly and formally measured across a number of metrics internally and externally including:

- IT Operational Service,
- Project delivery,
- System Performance
- Financial Performance and
- (Internal) Customer satisfaction.

Our aim will be to continually improve performance across all measures.

3. We will deliver a programme of sustainable performance efficiency within IT

IT will directly contribute to, as well as enable, the delivery of the business strategy outlined within this Business Plan.

In order to meet and inform business demands, Technology Innovation will be a key driver.

Summary of Investment

The delivery of our IT strategy is dependent upon the investment summarised below:

Key Investment: Our strategy will be to retain, maintain and enhance the recognised best in class applications and supporting infrastructure currently in use.	
Capital expenditure on the IT platform	£54.7m
Operating Costs	£147m
Total	£201.7m
Southern Gas Networks' share of this expenditure (65%):	**£131.1m**

The Benefits/Outputs:

- This investment will ensure continued high availability, system reliability and operational cost efficiency in line with our current high performance across the IT estate.
- It will avoid the need for large scale system replacement and the associated costs.
- It will enable higher levels of customer satisfaction through the use of real time and web enabled solutions for connection quotations and the provision of real time information updates to our customers.
- It will directly contribute to, as well as enable, the delivery of the business strategy outlined within this Business Plan that will in turn define the company throughout GD1 and beyond.

Why we will do this

We have undertaken extensive industry analysis and external benchmarking in order to look at alternative options to further drive efficiency and ensure our prime objective of providing IT Reliability and Availability. We have considered system replacement and out-sourcing/ in-sourcing alternatives. However, the results of our analysis and benchmarking fully support the Business Plans relating to IT and Telecoms.

The investment of £201.7m equates to £25. 2m per annum on average over GD1compared to average expenditure of £31m per annum during the current price control. This represents a 29% cost efficiency in the running of the IT estate and places us in the upper quartile of cost efficiency (i.e. the most cost efficient) as demonstrated through our independent external benchmarking.

Reliability and Operational Performance: IT Cost Efficiency

The total IT opex running costs will be £147m over the entire price control period and this will equate to an annual running cost of £18.4m. The allocation of these costs to Southern is £12m p.a.

The total planned capital investment is £54.7m. These costs equate to an average annual capex of £6.8m, of which Southern's allocation will be share in £4.5m.

Our external benchmarking and extensive analysis of IT vendors and technology solutions has clearly demonstrated that retention and enhancement of our existing IT estate and the investment outlined above not only provides leading technology solutions to our workforce but further more, enables a continued efficiency of our capital investment costs throughout the next price control period.

We have also undertaken a thorough and independent benchmarking exercise with Gartner Consulting where our IT costs were compared against a peer group of 17 similar sized organisations from the Utilities, Oil and Gas sectors. Details of this exercise are included in Appendix P. They are summarised below for ease of reference:

Cost Efficiency: A Summary of Gartner's Findings

- SGN's IT spend will be 2.9% of Revenue. This is significantly lower than the market average IT spending in 2011 which was 3.5%[4] and the average spending of our peers which is 3.7%[5]
- SGN's average IT spend p.a. as a percentage of expenditure is 2.6%. This is significantly lower than the market average IT spending in 2011 which was 4.3%[1] and the average spending of our peers which is 4.0%[2]
- SGN's infrastructure and operations expenditure is 17% lower than the peer comparison group[2]
- SGN has demonstrated that its' cost efficiency in the running of IT is within the lowest quartile of similar sized organisations within our Industry, i.e. the most cost efficient[2]
- In addition to exceptionally efficient IT costs, SGN's service levels are in the main, higher than our peers[2]

It should be noted that although our IT assets are in general relatively new, the total cost of ownership will steadily increase throughout GD1 due to the ageing of the estate and there will therefore be associated increased maintenance costs of our IT. However, we will ensure that this increase will be offset by ongoing efficiencies in the management and maintenance of the IT estate which has been demonstrated throughout the current price control period. Therefore, despite a lack of significant capital investment in our IT estate, we will ensure a flat cost profile of the operational costs associated with IT and Telecoms year on year.

[4] Gartner: IT Metrics: IT Spending and Staffing Report, 2011. 25 January 2011
[5] Gartner for IT Leaders Scorecard. May 2011 (Prepared for SGN)

9.3 Transport

Summary

We will continue to invest in the maintenance and development of our commercial fleet and company cars during GD1. Our strategy of purchasing these vehicles, rather than leasing, together with extended retention periods, is being implemented during the current price control period to ensure that we deliver the benefits listed below:

- Provide safe reliable vehicles which are fit for purpose;
- Enhanced driver safety, through the improved safety features delivered by more modern vehicles;
- Increase effectiveness, minimising breakdowns and maximising productivity;
- Allow staff to carry out their duties with minimal risk;
- Minimise our impact on the environment.

We intend to invest a total of £40.2m to ensure that our fleet is replaced in the most cost efficient and effective manner. In accordance with our environment policy we are targeting a year on year reduction in CO_2 emissions produced by our fleet. At the start of GD1 this will be 120g/km and through the continuation of our environment policy and procurement strategy, we aim to reduce this by 5% per annum out to 2020/21.

Investment

To ensure we can deliver our staff to locations anywhere within the network where their skills are required, we operate a fleet of commercial vehicles. This fleet consists of some 1360 vehicles, which can be split broadly across three categories as shown in the following table:

Vehicle Type	Number
Light Commercial	940
Company Cars	370
Heavy Goods Vehicle	50

During GD1 we intend to continue with our current policy which will require the investment of a total of £40.2m to ensure that our fleet is replaced in the most cost efficient and effective manner. Full details of our investment strategy for transport and plant are provided in Appendix P.

Outputs and Historical Performance

At the time of the Network Sale, we inherited an ageing commercial fleet where the average age of these vehicles was over six years. Since then, we have placed significant emphasis on updating our fleet to ensure we have safer, more efficient vehicles that better suit our needs; while at the same time allowing us to reduce our environmental impact and deliver a better service to our customers. By the end of the current price control (2012/13) we will have replaced the entire fleet, improving the average age of our commercial fleet to less than four years and achieving a 25% reduction in CO_2 emissions.

Justification and Benefits

Prior to commencing our vehicle replacement programme during the current price control period, we undertook a full evaluation of all our vehicles and the tasks they are required to perform. We also formed a Transport User Group to advise on specific modifications that would provide benefits to both users and the business. The completion of this process allowed us to formulate specifications that are different for each of our main functions: Repair, Maintenance and Emergency.

Vehicle selection focuses on proven reliability, the ability to cater for our specific needs such as weight bearing and towing capabilities, and cost. The type of vehicle purchased for a given activity, and the racking specifications installed are developed in house by a group of users. These are then trialled and fully developed before being introduced into the fleet.

Our evaluation process not only looked at vehicle specification, it also reviewed the economics of ownership versus leasing. We believe that the most efficient option is to purchase and own our vehicles and further details on the analysis behind this position; as well as the justification for extending vehicle retention periods are provided in Appendix P.

We have now adopted the following replacement periods for our fleet:

1. All light commercial vehicles, with the exception of those with onboard power, will be replaced every 7 years, or when a mileage of 150,000 miles has been reached.
2. All light commercial vehicles with onboard power, will be assessed for replacement at 5 years, but where possible will be retained for 7 years.
3. All heavy commercial vehicles will be replaced every 10 years, or when a mileage of 150,000 miles has been reached.

One of the most significant benefits derived from replacing ageing vehicles is driver safety. This is due to the fact that new vehicles are equipped with modern safety features which include driver and passenger side head and thorax air bags, antilock brakes, electronic brake distribution, roll over mitigation and improved security features. Dependent on the intended usage of the vehicle, we will provide further safety related enhancements such as vehicle reversing proximity alarms and handles to aid access and egress from the rear of the vehicle.

Additionally and in order to comply with our environment policy we will target a reduction in CO_2 emissions. By the start of RIIO-GD1 any new cars purchased will be restricted to a CO_2 output of less than 131g/km. This will be gradually reduced over the period to provide further reductions in emissions.

All major car manufacturers are continually developing initiatives to increase fuel efficiency and drive down emissions. To ensure the opportunities created by these developments in vehicle technology are not missed, we will continue to carry out an annual review the vehicles on our car lists.

Alternatives to Investment

Two options for the procurement of the fleet were considered, contract lease or buy. A comparison of the costs of buying or leasing an 'average' vehicle is detailed in Appendix P. Our cost benefit analysis shows that ownership is better than contract lease for a 5 year retention period.

Stakeholder Engagement

Our stakeholder events have been well attended and participants have been positive in their reaction to the way we have reduced our environmental impacts, especially in relation to our vehicle emission targets.
We have recently added an additional safety message to the branding of our vehicles to promote carbon monoxide awareness. This has had very positive support from our stakeholders.

9.4 Other Investment

Insurance

We have worked with our Insurance Broker over recent years to secure an insurance programme which balances the risks to our company with the rewards from minimising premiums. Over the 5 years to 2011, as a group, we have achieved a reduction in our premium costs in real terms, adjusting for movements in exposure, of just under 50%.

This reduction has been achieved as a result of ongoing review in the following areas:

- Policy Limits. Continuous updates to the potential cost exposure from a range of risks, for example; from Business Interruption.
- Joint presentations by Insurance Broker and SGN to selected insurers. Part of a wider remarketing of insurance portfolio.
- Multi year fixed rating agreements. To provide stability of premiums and ensure benefits from review of risk and remarketing initiatives are experienced for as long as possible.
- Risk Management. Review of operations of business, surveys and inter industry loss event data. Undertaken to minimise the risk profile of SGN within the insurance market.

While significant progress has been made in reducing the premium costs annually we are aware of two factors which indicate that premiums are forecast to have reached the minimum levels attainable.

- Firstly, we believe that our risk exposure is at an optimum level. Ongoing annual review of this position will take place naturally to respond to information on insurance events as they occur. However we do not believe this will materially change the basis of the insurance portfolio. Therefore no further gains in insurance premium reductions are forecast.
- Secondly, there are indications that in areas such as motor insurance there is significant upward pressure on the cost of insurance premiums. In the case of motor cover, industry trends are showing above 10% annual inflation. We have limited this assumption going forward to an annual 10% real price increase. Other insurance classes, while not currently demonstrating real price pressures, have remained level. This is mainly through the ongoing risk management initiatives and continual review of policy limits. We feel the potential for further benefits for premium reduction from these initiatives are limited to at best restraining insurance increases to current levels.

Further investment in offtake resilience is anticipated to remove a proportion of the insurance premiums covering Business Interruption. We have estimated this benefit will be sufficient to offset the upward pressure on premiums.

Following the demerger from National Grid we did not have an individual claims experience. Insurance markets are wary of taking on liability risks without a detailed confirmed claims experience. The use of a captive was an effective tool to purchase competitively priced insurance post sale. With each completed year, claims experience has become more mature and this has enabled the market and captive premium to be driven down significantly. Captive insurance companies are duty bound to provide market competitive rates. Captive premiums have also been benchmarked by our Insurance Broker. Over the period since sale to 2010/11 we have delivered a reduction in Captive Insurance Premiums for Employer and Public liability of just under 40%.

Property

Summary

We will invest in the maintenance and development of all our Properties during GD1. Our property strategy aims to deliver the following key outcomes:

- Business continuity by securing our strategic positioning of operational properties
- Connecting with our customers through local depots
- Suitable working conditions for our engineering and support employees
- Minimise our environmental impact where potential

This strategy will be delivered by the acquisition of a number of suitable freehold properties for both Operational and support functions. In parallel we will seek to refurbish existing sites to provide for the developing interface with our Customers and Stakeholders. Our ongoing targeted maintenance programme seeks to prolong the useful life of our facilities at minimum cost to the consumer.

We will deliver these objectives by investing £16.4m over the formula period. In conjunction we forecast costs for the maintenance of sites and associated overheads of and average £4.2m per annum during the period.

Office sites

Our corporate objective is to ensure our primary output targets are supported by a property and estates strategy. As highlighted above we ensure that our work management and support service activities are suitably located within our business to minimise travel and maximise contact with operational functions. Our property decisions will enable us to interact successfully with our wide stakeholder base. By investing in office properties we will seek to incorporate the most efficient environmental management technology reducing our impact through carbon emissions on the local community. The refurbishment of our properties is driven by compliance and economic stewardship.

Expenditure

Maintenance

Across the office sites estate refurbishment and repair work will be required. Our process of estate review will continue to identify remedial and refurbishment works.

The rationale for the expenditure identified relates to statutory and regulatory compliance and the prevention of future liabilities from enforcement of increasingly stringent environmental, SHE and other regulations. We have included a sum of £0.5m over GD1 to enable us to discharge our duties in respect of these requirements.

We believe that the general running costs of our portfolio of sites will remain broadly constant during GD1. One particular area, energy costs, will impact our direct and indirect operational costs. We have included increasing utility costs by on average around 5% per annum.

Investment

In addition to these business-as-usual running costs we intend to invest further in our main sites as follows:

Investment programme: RIIO-GD1

Horley	£1.3m	roof, air conditioning and refurbishment work
St Mary Cray	£1.7m	roof repairs, replacement air conditioning and office refurbishment
Walton Park	£1.0m	roof replacement/refurbishment

During GD1 we have no requirement to secure business-critical sites for Office functions. This objective has been achieved by our prudent investment during GDPCR1.

Depots

Across our network we have 10 operational depots providing emergency and maintenance functions for our stakeholders. In accordance with our property strategy of maintaining direct control over business critical sites we are instigating a programme of site acquisition during GD1.

Our proposed investment will target our business critical sites identifying economically justifiable opportunities to acquire sites depending on our current leasehold portfolio. Identified expenditure reflects the anticipated purchase cost of each property based on current investment market valuations. Legal and associated purchase costs have been included to reach a total expenditure of £12.1m. Detailed plans for the costs associated with this investment programme are outlined within our supporting Business Plan development templates.

We have identified the need to provide customer facing areas within depots to improve interaction with the communities we serve. A cost of £0.3m over GD1 will be incurred where there are no existing plans for substantial refurbishment or relocation.

Work Management

We have developed our work management structure in parallel with our operational depot business model. This has created an effective management solution which is focused on planning and directing the safety, maintenance and investment activities of our gas distribution business.

The benefits of this are evident in the reduction in Work Management costs over the initial years of the current price control period. This reduction of £3m over three years has brought our business to a level of efficiency which we aim to sustain throughout GD1. Our expenditure in GD1 will be £23m p.a. on average.

Analysis of the efficiency of our work management function using regression demonstrates that we have been in the upper quartile range of efficiency in the first three years of the current price control. This is further discussed in our section on the efficiency of our business. We believe that our forecast work management costs through out RIIO-GD1 will continue to provide an effective support to our operational business and provide value for money to our customers.

In our supplementary appendices on regional factors and our strategy on customer service provision we have identified the need to invest in our interface with customers in and around London and the South East. This will be supplemented by a small increase in central customer service representatives and the use of our Emergency labour force during lower workload periods in the summer. We forecast an increase of £0.9m from our current level. Combined, these initiatives are focused on ensuring the service experienced by our customers in the South East of England engenders the same level of satisfaction as our wider customer base and that across our network customers can expect a consistent and high quality service.

In our plan for future investment in Safety and Reliability we have identified an extensive programme of asset replacement capital to ensure the network safety and integrity is maintained. To achieve this we have identified that the capacity of our asset management function must increase to enable efficient design, planning and control of the programme outlined. We have identified this as an additional 12 FTEs at a cost of £0.6m per annum.

Support services

Our support services function incorporates the leadership structure and the non engineering professional functions required to operate a successful gas distribution business.

Since sale in 2005 we have striven to build a support function which is both effective and efficient. We have achieved this by following a number of strategies which are appropriate for the service required:

- Ensuring our business model enables scale economies
- Procuring services through partnership arrangements with third parties
- Regular review of service arrangements to ensure most efficient market price
- Developing the professional skills and capabilities in house to reduce dependency on third parties

The success of these strategies is evident in our market leading procurement of IT services and Insurance as demonstrated in this chapter and the supporting appendixes.

Unlike other activities within our industry the application of standard econometric analysis to Support Services costs has not proven successful. To demonstrate our performance to date and our confidence in our forecast RIIO-GD1 expenditure we have outlined within Appendix P the evidence supporting our future costs. This includes benchmarking comparisons or market intelligence where appropriate.

We intend to spend £27.0m p.a. on average across GD1 in providing these services. We have incorporated into our future costs investment to ensure we replace employees during a period of increasing retirement. This comprises of a programme of apprenticeships and industrial training for lower skilled roles, professional engineering and non engineering graduate recruitment and development and a training and development programme for associate professional occupations. In our section on people within our business we outline the need for and objective of this programme and demonstrate that our future performance in all key outputs are dependent on developing our labour resources in advance.

In addition, Xoserve is required to submit a standalone Business Plan and data tables for RIIO-GD1. We have been party to the development of Xoserve's Business Plan and fully endorse it. Our portion of the Xoserve costs for RIIO-GD1 is £56m for opex and £11m for capex. This expenditure has been included in our Business Plan Data Templates, as required by Ofgem.

The Efficiency of Our Business

Summary

The funding proposals set out within this Business Plan represent an efficient, value for money service for our customers. This is substantiated through an analysis of historic expenditure performance, assessment and comparison of market prices and benchmarking throughout the plan.

A key tool in demonstrating the value for money of our core activities is the application of benchmarking across the GDNs, based on regression analysis of past expenditure. We fully support this 'top down' benchmarking. However, we believe there are flaws in the annual analysis carried out by Ofgem, and we have adjusted this work to ensure regional factors and atypical costs are taken into account. In addition, in a few areas, we have used more appropriate cost drivers.

Overall, with these adjustments taken into account, we believe our business ranks at the frontier for overall, total expenditure. This is an achievement we are proud of and intend to maintain during GD1. The investment detailed in this Business Plan is designed to do just that, whilst ensuring we are able to meet the outputs we have committed to.

10.1 Efficiency Analysis

Analysis of our expenditure efficiency leads us to conclude that our baseline expenditure in 2010/11 is equivalent to upper quartile performance. Combined with realistic projections for movements in input prices (real price effects) and ongoing productivity we can state that the expenditure highlighted within this Business Plan represents value for money for our customers throughout GD1.

The following tables illustrate the statistical cost assessment for total controllable Opex and Tier 1 mains and service Replacement. Together they represent over £200m of our annual totex. We clearly represent the benchmark position for operating costs and have done across all years in the current formula period. Replacement assessment places us within £3.8m of the upper quartile position. We believe that when this is considered along with other factors it demonstrates that we do deliver our safety targets at an efficient level.

In this chapter and the supporting Appendix Q we discuss the conclusions and methodology adopted in assessing our performance to date.

Regression analysis has been employed extensively by Ofgem for comparative efficiency analysis. Most recently, Ofgem utilised the technique in its March 2011 'Decision on strategy for the next gas distribution price control - RIIO-GD1 Tools for cost assessment'. The regressions published in that document represent a simple evaluation of the gap between GDNs' relative performance. The analysis was undertaken in the absence of comprehensive regional factor adjustments and did not factor in adjustments for atypical costs. The purpose was to encourage each GDN to explain the components of the gap and show what if any action is required to eliminate it.

Appendix Q provides our detailed assessment of relative efficiency using the regression analysis techniques employed by Ofgem and amended as discussed above. We also explain in detail the justification for our proposed company specific and regional factor adjustments. These ensure that all GDNs are compared on a like-for-like basis.

	Panel Data Ranking – Top Down Opex							
GDN	EoE	Lon	NW	WM	No	Sc	So	WW
2008/09	8	6	7	4	3	1	2	5
2009/10	5	8	7	6	3	1	2	4
2010/11	5	7	8	6	3	1	2	4

	Panel Data Ranking – Repex							
GDN	EoE	Lon	NW	WM	No	Sc	So	WW
2008/09	3	8	6	1	4	5	7	2
2009/10	3	1	7	8	6	4	5	2
2010/11	2	5	7	8	6	3	4	1

10.2 Regional Factors

We have summarised below those company specific and regional factors which we believe materially distort any comparison of GDN performance. In all our cost assessment which is derived we incorporate these factors.

The use of statistical regression modelling to evaluate relative company performance depends on key assumptions. Primarily the cost driver selected to model the relationship between expenditure and workload must be able to effectively explain the variation in costs at different levels of activity. The relationship between driver and costs should also be logical and able to be explained in the context.

A second core assumption in establishing a statistically significant link is that any effect of exogenous factors can either be modelled through combining multiple cost drivers or removed from the data set. In analysing and quantifying the following factors we are able to adjust the base costs and hence improve the value of the assessment technique.

Ofgem, in its March decision document, incorporated its latest thinking on direct labour and contractor regional prices difference. No other regional factors were incorporated at this stage, although GDNs were encouraged to include justification for and evidence of their own company specific factors. Those which we believe impact our performance are summarised below.

Labour Regional Factors

We believe that Ofgem's published direct and contractor regional factors do not fully represent the impact of regional differences on all GDNs. Our analysis shows the following issues distort the validity of the output.

- **Individual GDN factors:**
  - We have demonstrated that the range of labour prices across all eight GDN footprints is significant and materially affects the comparison of GDN efficiency.
  - Central to this is the removal of Ofgem's assumption that regions out side of London and the South East do not exhibit differences in labour prices which could distort cost comparison.
  - We have shown through analysis and external expert review that this assumption is not correct.
  - For this reason we have used the revised factors in our analysis.

- **Methodology:**
  - In calculating direct labour regional factors Ofgem has failed to recognised the significant impact that the occupational structure has on relative wage costs.
  - We have demonstrated that deriving a mean wage which reflects the occupational weightings within GDNs better represents the cost environment in which the GDN operates.
  - We have incorporated this into our labour factor indices.

The revised labour factors included in our analysis are as follows:

Table 10.2 Regional Labour Factors
Average Regional Labour Factors: 2008/09 – 2010/11

	Direct Labour Wage Factor		Contractor Labour Factor	
GDN	**SGN**	**Ofgem**	**SGN**	**Ofgem**
EoE	0.97	0.95	0.96	0.97
Lon	1.15	1.19	1.13	1.12
NW	0.97	0.95	0.92	0.97
WM	0.92	0.95	0.94	0.97
No	0.96	0.95	0.93	0.97
Sc	1.02	0.95	1.02	0.97
So	1.09	1.08	1.10	1.08
WW	0.92	0.95	0.99	0.97

In addition to these adjustments, we have applied a range of company specific factors which we believe impact the costs of operating different networks.

- Urbanity: Working within a busy, constricted and densely populated capital city environment containing critical transport routes, economic hubs and areas of historical import increases a GDN's cost base significantly above a similar urban area. Within the area in and around London a GDN will experience higher costs working in carriageways, travel times, complexity of working below ground, higher material prices and access restrictions amongst a range of other impacts. This effect has been normalised in the analysis undertaken. We have evaluated the average annual impact of urbanity at £13.5m p.a.
- Customer Expectations: Ongoing reporting of customer service results during the current price control period has illustrated that those GDNs which operate in and around the London and South East region display on average lower customer scores. Experience of working in these areas has indicated that while every GDN has a core responsibility to deliver a similar level of customer satisfaction regardless of geography, the effort required to realise the same customer outcome is different by region. We have included additional expenditure in our Business Plan at an average of £1.0m p.a.

10.3 Adjustments for Atypical Costs

In addition to the impact of regional differences on regression analysis, costs which are atypical across GDNs or between periods will also distort the validity of the analysis. We have also identified and adjusted for a range of these in our revised analysis. The key distortions removed are as follows.

- Streetworks: The introduction of TMA and TSA legislation has generated additional costs for GDNs. This was recognised by the provision of an uncertainty mechanism in the current price control period. As the introduction and enforcement of the new legislation has been inconsistent across GDNs it is important to remove these costs from efficiency comparisons. The efficiency of these additional costs has been the subject of an income adjusting event for some GDNs and within our Business Plan we also highlight the level of these cost impacts now and for the future. We have adjusted for a total 2010/11 Streetworks impact of £7.5m in 2010/11.

We also believe further consideration must be given to the following atypical expenditure items. As we are not able to assess their direct impact on efficiency without access to data from other GDNs we include them here to highlight our concerns over the impact they will have on cost comparison.

- District incidents: Every GDN at some time experiences significant costs in repair and restoration from the impact of interference by third parties on its local networks. These are broadly exogenous factors and not consistent across periods or entities. They therefore have a significant distorting effect on regression. We have experienced significant levels of such incidents during the current price control period.

- Routine / non-routine maintenance: As we highlight in the accompanying Appendix Q the use of normal cost assessment techniques to determine whether the level of maintenance in an individual GDN is efficient does not accommodate the strong link between previous levels of investment in asset replacement and the current health and risk of the existing assets. These factors will become more transparent in GD1 as the introduction of Asset Health Indices is introduced. We believe that until such time as this information becomes reliable and consistent current levels of maintenance expenditure must be considered on an individual GDN basis referring to investment programmes and company performance in areas such as network reliability over the current price control period.

10.4 Selection of More Appropriate Cost Drivers / Model Structure

The selection of an independent variable which effectively explains the variation in expenditure at different levels of periods is vital to the validity of the regression analysis. We have made the following improvements to the Composite Scale Variables (CSVs).

- Top Down Opex: We believe that including Mains / Service Condition Reports into a CSV for total opex distorts the quality of the regression output. Analysis of the relationship between reports and PREs suggests that reports are a less reliable workload driver than repairs.
- Repairs: We have adjusted the workload driver to repairs and not reports. We believe that this more accurately reflects the effort and resulting costs incurred in remediating the escapes on our assets. We have also indicated the benefits of combining as a cost driver the secondary output of repairs effected within 12 hours. This provides a clear link between the costs incurred and the service to our stakeholders. Replacing reports with repairs improves the repair regression goodness of fit from 0.73 to 0.85.
- Outliers: We also identified an outlying data point on emergency regression which was having a very significant impact on the quality of the model. We have removed all three data points for the individual GDN and this has improved the quality of the assessment output.

We have also undertaken a range of other benchmarking activity in preparing our Business Plan. This includes benchmarking of indirect costs and capex. We have justified our Business Plan using **Gartner** for IT and on capex we have used market tested projects backed up by best practice reviews conducted by **Jacobs**. These third party reports are available on our website.

10.5 Productivity and Real Price Effects

We are focused on ensuring our customers and stakeholders continue to benefit from the significant efficiency improvements we have achieved since sale. Our evaluation of the productivity benefits which we have achieved since sale is that we already have surpassed the demerger savings identified by Ofgem.

Looking to GD1 we do not believe there continues to be the same scope for productivity gains in labour efficiency or the reduction in overheads. As a company we are committed to ensuring that the benefits achieved to date remain for our future customers.

Our assumptions on productivity reflect the significant progress made up to the current period. These include:

- Moving to our current operational depot structure ensuring focus on quality and safety
- Reduction in our reliance on external contractors
- Economies of scale within Support Costs across an expanding business
- Gradual development of our work management and corporate functions ensuring their size and skills are fit for purpose

As these initiatives are now embedded into our business and delivering real safety, reliability and economic benefits we do not believe that there are further significant productivity benefits to be achieved during GD1.

In particular the occupational support costs of our business are at a minimum level. This is demonstrated by the consistent performance shown in our assessment of historic costs and supported by our third party analysis of key activities such as IT. Further cost reductions in these areas would begin to harm our delivery of key safety and reliability outputs. For this reason we have not incorporated any ongoing productivity improvements in this area.

We have commissioned an external review of productivity from **First Economics** to evaluate the progress made to date and the potential for GD1. This report confirms our initial assumptions and is available on our website.

The productivity assumptions made within our Business Plan are as follows.

Productivity Assumptions

Activity	2013/14	2017/18	2020/21
Operational Opex	1.0%	1.0%	1.0%
Operational Support	0%	0%	0%
Repex	0.5%	0.5%	0.5%
Capex	0.6%	0.6%	0.6%

We have noted that these assumptions, from 0.5% to 1.0%, are within the ranges included in recent formula determinations, such as the Bristol Water Competition Commission referral.

Impact of real price effects

We have identified within our plan key areas where pressures will increase input prices above inflation during GD1. Where ever possible we have sought to limit the exposure of our customers and stakeholder to these costs. These cost pressures are closely linked to:

- The macro economic impact as the UK gradually emerges from recession over the next couple of years
- Availability of skilled labour
- Demand for key materials
- Increasing fuel prices

In determining our future expenditure requirements we have been aware of the need to identify material changes in price levels in key cost components. Wherever possible we will pursue a procurement and employment strategy which minimises the costs to our stakeholders. This strategy has been incorporated into our detailed costings throughout this plan.

Where there is evidence that costs may vary above the general expected level of inflation during GD1 we have identified the additional expenditure. As an industry we are exposed to many of the same cost pressures and therefore have been worked in partnership with other GDNs to determine what our exposure to these effects may be. We have commissioned work by external consultants **Oxford Economics** to critically review key cost areas for the period of GD1 and provide their professional opinion on the likely price movements. **Oxford Economics**' report is available on our website.

The key real price effect assumptions included within our programme of works are as follows:

Real Price Effects: GD1

		2013 /14	2020 /21	Average GD1
Labour	Staff	0.2%	1.1%	1.0%
	Industrial	0.1%	1.1%	1.0%
Materials	PE Pipe	-0.1%	1.1%	1.0%
	Steel	0.7%	-0.2%	0.7%
	Fuel	0.9%	2.8%	2.4%
	Reinstatement	-0.2%	0.9%	0.7%
Contractors	Emergency Services	0.5%	1.8%	1.6%
	Maintenance	0.4%	1.3%	1.3%

In addition to this we have referred to other external sources of future price impacts. These include the Department of Energy and Climate Change paper on 'Estimated impacts of energy and climate change policies on energy prices and bills' and the determination of the Competition Commission review in regards to Bristol Water (Appendix K:28).

The full effects of changes in RPEs are discussed in full in the accompanying Appendix Q.

Conclusions

We have outlined in this chapter our approach to determining the efficiency of our business. The evidence we have presented, supported by our analysis in the accompanying Appendix Q, demonstrates that we are an efficient GDN.

Building on this we have shown that our assumptions on productivity and real price movements during GD1 will ensure that the customer will benefit from a safe, secure and reliable gas service at minimal cost.

10.6 Expenditure Requirements

Summary

Our totex expenditure requirement for GD1 is £410m on average per annum. This is made up of:

Operating expenditure	£131m
Replacement expenditure	£189m
Capital investment	£69m

This represents an average annual increase of around 1p for the typical household. This investment will help to ensure we continue to provide a safe and efficient service to all our customers, whatever the weather.

Total Operating Expenditure (Controllable)

£m (2009/10 prices)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Opex									
Direct	102	104	106	107	105	106	106	106	841
Indirect	25	26	26	26	26	26	26	27	209
Total OPEX Costs	127	130	132	133	131	132	133	132	1,050
Exceptional Items									
Holder Removal	1	9	14	11	14	12	11	9	81
Land Remediation	3	3	3	3	3	3	3	3	26

Total Replacement Expenditure

£m (2009/10 prices)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Repex									
Core Repex	173	174	176	178	179	181	183	184	1,427
Risers	11	11	11	11	11	11	11	11	87
Total REPEX Costs	184	185	186	188	190	192	194	195	1,514

Total Capital Expenditure

£m (2009/10 prices)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Total
CAPITAL EXPENDITURE (CAPEX)									
Asset Integrity	21	23	25	25	26	27	27	26	199
Capacity	24	33	11	9	7	8	12	8	113
Connections	7	7	8	8	9	9	10	10	68
Capitalised Overheads	4	4	4	4	4	4	4	4	31
Other – Non Operational	33	14	10	17	21	18	11	9	133
Gas Holder Removal	0	3	1	-	-	-	-	-	5
Network Security	0	0	0	0	0	0	0	0	3
Total CAPEX Costs	89	85	59	64	67	67	64	57	553

In calculating the expenditure above we have incorporated all the forecasts and assumptions highlighted throughout this Business Plan. These include projections on the workload, productivity, real price effects and company specific factors.

TOTEX and Financial impact of Business Plan

£m (2009/10 prices)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Total
TOTEX									
	404	412	395	399	406	406	404	397	3,223
FINANCIAL IMPACT									
Closing RAV*	2,939	3,016	3,080	3,148	3,229	3,310	3,381	3,441	
Revenue	583	601	619	624	620	618	628	639	4,932

* Excludes £4m “true up” to the opening GD2 RAV, to recover the slow money element of the Opex frontier reward

Capital Structure and Financial Assumptions

Summary

Context

Our Business Plan highlights the need to spend £512m per annum to deliver what is important to our stakeholders. This encompasses the need to maintain networks that are safe and reliable, as well as new investment. As a result, we will need to raise approximately £1.4bn of new and replacement debt during GD1.

We are committed to providing best value for our customers whilst ensuring ultimately that we are able to secure the investment they require. We have therefore developed a robust financing plan, incorporating prudent, pragmatic and objectively reasonable assumptions, to ensure we are able to deliver for our customers, the environment and our investors.

Financial and capital markets have been extremely volatile ever since the financial crisis of 2008 and the outlook remains uncertain. The ongoing sovereign debt crisis in the Euro-zone, in particular, suggests markets are unlikely to stabilise any time soon. Further, the growth in the broader economy remains weak and difficult to predict. Combined with the new RIIO price controls, the implications of electricity market reform proposals and the ongoing, but uncertain, challenges presented by the need to adapt to climate change, the challenge of financing our activities over the next ten years to 2021 is more uncertain and challenging than at any time since privatisation.

We are long term investors in our two networks and are committed to the long term stewardship of our assets. Our equity return requirements in our Business Plan reflect our view of the risk profile during GD1 and the uncertainties on cashflow and returns.

Cost of Capital requirements

Therefore, achieving an appropriate return has been a key focus for us and we have carefully considered evidence on both the cost of equity and cost of debt.

With regard to cost of equity, we have examined both the CAPM principles and the risk faced by our shareholders. This produces a range of between 6% and 8.7%. Our Business Plan is based on a 7.5% equity return. (This is discussed further in Section 11.1 of this chapter.)

We have also examined the practicalities of raising £1.4bn of debt during GD1 against the iBoxx index, and believe that at least 60bps needs to be added to the index to incorporate additional risks, issue premium and actual costs not covered by the index. (This is discussed further in Section 11.2 of this chapter).

Finally, we have looked at the notional gearing and conclude there should be no change from the current 62.5% (This is discussed further in Section 11.3 of this chapter).

Combining these, we are proposing a real post tax weighted average cost of capital of 4.6% (vanilla WACC of 5.1%).

Financeability

Our Financeability requirements are based on definitions previously used in price control determinations:

'Ensuring that, if reasonably efficient, a company's revenues, profits and cashflows should allow it to raise finance on reasonable terms in the capital markets.'

In order to assess the financeability of our proposals, we have taken our cost of capital proposals and carried out scenarios based on plausible performance outcomes. We have assessed these outcomes in terms of:

- Equity metrics (Section 11.6)
  - Return on Regulated Equity ('RORE')
  - Dividend Yield ranges
- Credit Rating metrics (Section 11.3)
- Cashflow profiles (Section 11.3)

Consistent with the funding of debt (iBoxx index), which is based on a weighted A/BBB basis, we are looking to achieve credit metrics that fall within this range. Credit ratings remain an integral part of our financeability assessment and Standard & Poor's ([6]), for instance, have recently issued a paper on RIIO indicating that lower revenues and cashflows could increase financial risk which may have adverse implications on ratings – existing thresholds will only remain valid if they view business risk as being unchanged. As a consequence of our analysis, we have concluded that cashflows cannot be weakened from the levels in this current price control.

Therefore, we have fully addressed the impact of 100% capitalisation of repex (which defers £61m of cash per annum from current levels) through amending our depreciation rates. We have chosen to adjust regulatory asset lives to ensure the amount of depreciation provides the required level of cashflow on an enduring basis, rather than adopting transitional arrangements for the capitalisation of repex. Consequently, our plan is based on depreciating our regulatory asset value (RAV) over 38 years. We believe this also gives an appropriate level of RAV growth in GD1 of 3% per annum which is broadly in line with current levels. This maintains an appropriate balance between current and future customers. (This is discussed further in Section 11.4 of this chapter).

Finally, we have undertaken an analysis of the overall balance of risk and reward for the proposed price control package using the RORE framework. Based on plausible totex performance ranges, we have assessed the proposed incentive package, IQI sharing factors and baseline cost of equity for different gearing levels to determine how the package should be calibrated to move us closer to the RORE ranges put forward by Ofgem in its March 2011 Strategy Document ([7]), - a 12% return for a well performing network. As a result of this analysis, we propose the following:

[6] Standard & Poor's, September 2011 'How the proposed RIIO Regulatory framework could affect ratings on UK Energy Utilities'

[7] Ofgem March 2011 'RIIO-GD1 Overview Paper Decision Document' P26-27

- A range of additional incentives (See Section 11.6)
- A weighted average sharing factor of 70% of out / under performance (See Section 11.7)

Based on the above, the table below summarises the package put forward in this Business Plan;

Parameter	Current Price Control (GDPCR1)	Ofgem March Decision Document	SGN Business Plan Proposal	Comments
Weighted Average Cost of Capital (post tax real)	**4.34%**	**3.6% - 4.2%**	**4.6%**	
Cost of Equity (real post tax)	7.25%	6% - 7.2%	7.50%	
Cost of Debt (real)	3.55%	iBoxx Index	iBoxx Index	
Premium/Margin to 10 year trailling average	+30 bps within COD		+60 bps onto index	
Allowed gearing	62.5%	GDNs to propose	62.5%	
Cashflows before financing	To support investment grade rating	Efficient companies should be able to finance their businesses	To support A / BBB rating	
Capitalisation of Repex Fast / Slow Money	50% 54% / 46%	100% GDNs to propose	100% 36% / 64%	
Asset lives (years)				
Pre 2002 Assets	56	56	56	
Post 2002 Assets	45	45	38	
Post 2013 Assets	N/A	45	38	
Depreciation				
Pre 2002 Assets	Sum of Digits			
Post 2002 Assets	Straight Line	Sum of Digits	Sum of Digits	
Post 2013 Assets	N/A			
Backdated Depreciation	N/A	For 2002 - 2013 assets	For 2002 - 2013 assets	£174m for the period – to be phased over GD1.
IQI Sharing	100% Opex / 33% Investment	50-60% on Totex	Weighted average of 70%	This is achieved with Work Management, ODA, Business Support, Gas Holder Removal, Land Remediation and Non Operational Capex all at 100%
True ups from GDPCR1	N/A	Efficient Pension Overspends	Efficient Pension Overspends of £25m	£25m additional pension deficit payments in GDPCR1 – recovered over 8 years
		Fuel Poor Costs	Fuel Poor Costs of £4m	£4m to be recovered through RAV
Tax	GDN Specific Tax Allowances Tax losses rolled forward	GDN Specific Tax Allowances Tax losses rolled forward	GDN Specific Tax Allowances Tax losses to accrue only from post tax regime of 2007/8	

It should be noted that deterioration of any one of the above parameters would require a compensating change in one of the others.

Cost to Customers

A final key component to us in our financeability assessment is the impact on customer bills. We charge gas shippers for using our network to transport gas. They in turn charge suppliers who then incorporate these costs in the prices they charge customers. Our charges make up around 15% of the average household gas bill. We recognise energy costs are rising and in developing this Business Plan we have been conscious of the need to deliver excellent value for money. We believe the improvements we plan to deliver will result in an average annual increase (excluding the impact of changing tax rules and true ups from the current price control) of well under 1p per day for the typical household.

11.1 Cost of Equity

We require an allowed cost of equity of 7.5% (real post tax) against a range proposed by Ofgem of 6% - 7.2%. The Ofgem range was based on equivalent risk to GDPCR1 and our recommendation is based on alternative evidence on the CAPM building blocks, cross checks against longer run returns and an analysis of the relative risk profiles in GD1 compared to GDPCR1. We conclude that taking all these factors into account, a top end cost of equity of 8.7% can be justified. However, given the top end would constitute a significant change from existing levels, we have allowed for a return of 7.5%, slightly above Ofgem's range but amended other financeability parameters accordingly.

11.1.1 Analysis of the CAPM approach

The Energy Networks Association ("ENA") commissioned an independent report by Oxera in early 2011 which reviewed the:

- New approaches under RIIO to setting allowed revenues
- Impact of changes such as the cost of debt index
- Volatility of cashflows
- Challenges faced in using a CAPM model

Oxera concluded that 7.5%, the upper end of this range, is appropriate assuming equivalent risk to GDPCR1.

There are a range of alternative methods for estimating the cost of equity other than CAPM including:

- Dividend Growth Models (DGMs)
- Residual Income Models (RIMs)
- Discount rates used in valuing assets in financial statements

Oxera's range considered the wider evidence available and also carried out cross checks including a review of long run returns (both overall equity market returns and the dividend growth model evidence). The resulting analysis confirmed that the low end of the Oxera range was inappropriate. This conclusion is further bolstered by the fact there was no evidence that the risk profile of the gas networks had fallen from the current price control where the cost of equity is 7.25%. In fact a further paper by Oxera commissioned by SGN examining the risk profile in GD1 concluded the cost of equity had actually gone up and constituted a premium of 1.2% (this is further considered in Section 11.1.4).

In summary:

	Oxera Range		Ofgem Range	
	Low	High	Low	High
Risk free rate	1.5%	2.0%	1.7%	2.0%
Equity risk premium	4.5%	5.5%	4.8%	5.5%
Equity beta	0.80%	1.00%	0.90%	0.95%
Post tax cost of equity	5.1%	7.5%	6.0%	7.2%
Additional risk in GD1 vs GDPCR1	1.2%	1.2%	Ofgem requested Networks undertake this analysis	
Proposed post tax cost of equity	6.3%	8.7%		

A full copy of Oxera's report can be found in the Appendix 'What is the Cost of Equity for RIIO-T1 and RIIO-GD1', but their main conclusions are summarised below:

Risk Free rate

Oxera's range for the risk free rate was 1.5-2%. The low end of the range has been affected by the recent departure of yields from historical levels due to monetary policy and increased demand for government bonds. A review of forward rates suggests that recent trends may well be short-term deviations relative to pre-crisis levels, and that the market expects risk-free rates to rise significantly higher than current rates. Oxera further studied the uncertainty in the risk-free rate by noting the widening confidence interval around recent forecasts, and concluded that forward rates may be insufficient in themselves to set the appropriate regulatory allowance. As such, Oxera has recommended headroom above the central 1.25% forecast for 2013. The idea of including some degree of headroom within the risk-free rate is consistent with recent regulatory decisions of 106bps over market rates over much shorter, five year price control periods, which therefore do not factor in the increased risk of the longer, eight year price control period currently under review.

Equity Risk Premium

Oxera surveyed the existing literature and empirical studies for the equity risk premium, and concluded that a symmetric range of 4.5-5.5% would be appropriate at this early stage, given that the estimate is for an eight year price control, the start of which is two years away. Due to the considerable uncertainty in capital markets, it would be premature to conclude on a point estimate.

Beta

In reviewing the equity beta, Oxera calculated a range of 0.8-1.0. The lower end was based on two year estimates, and the upper end was based on five-year estimates. Given that the lower end of the range for the utility beta gives considerable weight to the most intense period of the financial crisis and may have been temporarily affected and reduced by a flight to utility stocks, Oxera placed greater weight on the upper end of the range.

Thus, Oxera believes that the upper end of the cost of equity range, or 7.5%, is more reflective of fundamentals. This conclusion is further bolstered by the lack of evidence that the risk profile of the gas networks has fallen relative to the current price control where the cost of equity is 7.25%. The risk profile of GD1 and the impact on cost of equity ranges is further considered in Section 11.1.4).

Oxera believes there are challenges in applying the CAPM framework in the current financial and regulatory context, and therefore further reviewed the range against two alternative sources for the level of returns required by equity, including the dividend growth model and the premium for equity risk implied by the CAPM range relative to the debt spread. The size of the discrepancy between the CAPM range and the cross-checks suggests that it is prudent and necessary to consider whether the CAPM is systematically failing to capture factors that determine the returns required by equity investors in regulated energy networks. These reviews suggest that a higher range than one generated by applying a one-period CAPM approach would be appropriate.

11.1.2 Regulatory and International Benchmarks

We must compete with other GDNs, utilities and sectors, both in the UK and abroad, for capital. Investors will seek the most attractive risk adjusted return which means the returns we are able to offer cannot be developed without regard to the returns available to investors from alternative investments. For Ofgem to allow us a competitive cost of equity it should note:

- Any cost of equity below 7.5% would be below international comparisons
- Returns allowed by other regulators, adjusted for differences in risk, are higher than 7.5%. For example, Ofwat allowed 7.1% in the recent water review, but gas networks carry more risk than the water networks – particularly as a result of the RIIO proposals (see below) – and Ofwat's proposals were based on a lower level of notional gearing (57.5%) than our Business Plan.

It should also be noted that in Ofgem's March Financial Issues Strategy Document (8)Ofgem published their understanding of US regulatory determinations for pre-tax nominal ROEs. The US figures are actually post-tax rather than Ofgem's statement that they are pre-tax. The graph suggests that Ofgem's proposed pre-tax cost of equity is generous when in fact the reverse is true.

11.1.3 Investor Requirements

It is important for Ofgem to note that the cost of equity must be sufficient to attract and retain equity investment: existing investors cannot be taken for granted. Our shareholders have invested in Scotia Gas Networks for the long term. They are committed to long term stewardship of our assets and it is vital that regulated utilities retain quality investors. Our shareholders require stable and predictable equity cash returns that are indexed to inflation and they are concerned that even the top end of Ofgem's cost of equity does not adequately compensate them, particularly given the uncertainty and risk that is faced during GD1.

11.1.4 Changes in Risk between GDPCR1 and GD1

There is great uncertainty over issues such as streetwork costs, a new repex proposal and the introduction of debt indexation. Coupled with an extended eight year price control period, businesses need time to adjust to these material changes and should be supported by an appropriate premium.

The new RIIO framework introduces far more uncertainty than the current price control. Firstly, an eight year price control creates a higher risk of exposure to changes in key areas. We believe we have proposed a suitable set of uncertainty measures to mitigate our risk as much as practicable: however, the risk in the RIIO package is significantly higher than the current price control (where the cost of equity is 7.25%) with a much greater exposure to cashflow volatility. We have commissioned Oxera to carry out further quantification of the increased risk in GD1 compared to the current price control and they have concluded that an additional 1.2% can be added to our proposed cost of equity of 7.5%, giving a top end estimate of 8.7%. The Oxera report can be found in the appendix 'Impact of risk on the cost of capital and gearing.'

11.1.5 Increase in financial and capital market volatility

Since 2008, there has been a level of volatility in both the global financial and capital markets that is virtually without precedent.

This volatility has had knock-on effects, for example on perceptions of risk and associated returns, utility strategy, credit ratings, that are still playing out and becoming understood. There are a number of direct implications for the cost of equity;

- Recent long-term index linked gilt yields have become depressed. This is not just because current yields in the UK are distorted by the effects of quantitative easing, pension fund demand and unusually low base rates, but also because investors are seeking a safe haven from other sovereign debt markets and protection from inflation risk.
- The Equity Risk Premium (ERP) may increase during periods of volatility.

[8] Ofgem March 2011 'RIIO-T1 and GD1 Financial Issues (Figure 3.15, page 37)

11.2 Cost of Debt

11.2.1 Performance against the cost of debt index

The introduction of the cost of debt index has occurred at a historical low in the risk free rate and with corporate spreads back to the pre-crisis levels, Ofgem acknowledge in their March document there is little scope for rates to decline further. We believe that the current Euro crisis will impact significantly on the cost of debt in the future and there is unlikely to be a quick resolution to this issue. Also, there are structural reasons for why rates will increase in the future. In this section, we note the potential implications on rates of two structural changes within the banking sector, Solvency II and Basel III.

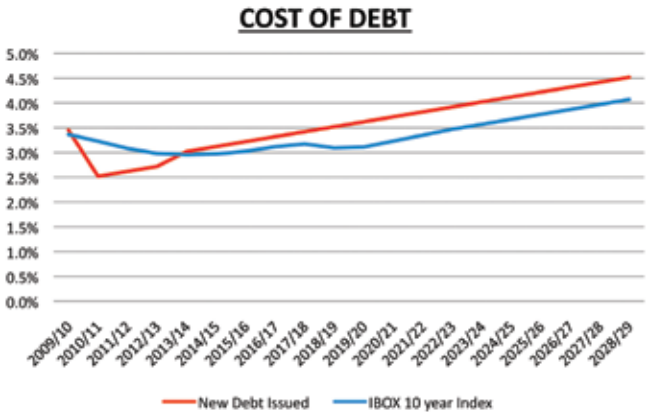
Solvency II is an EU initiative requiring insurers to maintain higher levels of capital if they hold longer dated assets and / or assets with lower credit ratings, thereby reducing the risk of insurers defaulting on their payments or having an adverse market impact. Over time, Solvency II will increase the actual cost of debt relative to the index, since insurers will be less willing to purchase bonds with longer maturity, thereby driving up their cost and making these bonds more difficult to issue.

Basel III, due to be phased in from 2013, is the new global regulatory standard on bank capital adequacy. Higher capital requirements for banks will drive up the actual cost of debt relative to the index.

With the introduction of Solvency II and Basel III, it is highly likely that the cost of debt for long-dated debt, and hence for utilities relative to corporates, will rise steadily over GD1.

Ofgem have indicated that, historically, networks have been able to issue debt at rates below the proposed iBoxx index and this provides the necessary headroom to cover additional financing costs and risk which they face. We do not believe, given the uncertainty facing the debt markets (potentially driving up new issue premium) and the impacts of Sovency II and Basel III, that companies can continue to outperform the index and therefore historical trends should not inform the future.

In addition, the chart below highlights the likely scenario that new debt will be more expensive than the ten year trailing average going forward, even with the cost of debt rising at a relatively small rate each year. SGN is likely to be faced with a scenario that not only will its cost of debt be higher relative to the 'spot' index but the overall funding of our debt over GD1 will be insufficient given the influence of historical lows in a ten year index in the current price control period continuing into GD1 (the impact of introducing an index at a historical low in the cost of debt).



The cost of debt index represents a material shift in methodology that is much lower than past regulatory pronouncements and too low to meet Southern Gas Networks' financing needs. The proposed 10-year trailing index is, and will continue to be, distorted by historical events, including the credit crisis and the recent central bank desire to maintain low real interest rates and does not recognise the future implications of the uncertain debt market and in particular the introduction of Basel III and Solvency II. Therefore no headroom exists to cover additional costs not covered by the index.

11.2.2 New Issuance Costs

An index that is designed to fund new debt issuance but based on secondary trading should include appropriate issuance costs and as identified above, there is no 'headroom' to fund this.

Therefore, it is essential to allow for costs not taken account for in the index:

Typical average

• New Issue Premia*	20bps
• Liquidity / Commitment Commission Costs	13-26 bps
• Other (e.g. arrangement fees, legal and credit rating fees)	10bps for bonds up to 50bps for bank facilities
• Inflation Risk Premia	30bps
• Securitisation	up to 7 bps

*The recent bond issue by Southern Gas Networks included a new issue premium of approximately 30 bps.

Additionally, there is additional upward pressure from the cost of carry (difference between cost of borrowing and interest rate earned on cash balances): capital markets have, from time to time, been closed to even strongly rated bond issuers, for example this summer there were no bond issuances for seven weeks. Companies need to pre fund themselves more than in the past due to uncertainty about the ability to tap markets as planned. Pre funding incurs a cost ('cost of carry') that needs to be compensated through the allowed cost of debt.

These items could easily add between 75bps and 100bps onto the secondary market index which is the basis for the iBoxx index.

Indeed AMP Capital, in their response to the December consultation, proposed that;

"…each network company includes a re-financing plan for the regulatory control period in its 'well developed Business Plan', including the cost of refinancing (e.g. credit rating agency fees, lawyers' fees (documentation and the like), and other professional fees for tax advice etc. (a simpler mechanism could be to include an allowance of 50-75 bps on top of the index value)."

11.2.3 The impact of the introduction of the cost of debt index on returns

The introduction of the cost of debt index arguably reduces risk compared to a fixed allowance approach that Ofgem have adopted historically. The fixed allowance has historically included an explicit allowance for risk and whilst this risk is borne by equity, it has been presented as a margin to the cost of debt. The impact however is to increase the returns on equity. This margin in GDPCR1 was 30bps.

The introduction of an index has the potential to transfer the impact of changes in market rates away from the company, however, the effectiveness of this transfer depends on the extent to which the cost of debt index accurately tracks the company's actual cost of debt. It should be noted that the margin in the fixed cost of debt allowance is completely separate from the margin in the risk free rate component of the cost of equity allowance. Since the cost of equity will not be indexed, the impact on required returns as a result of debt indexation is limited to the margin on the cost of debt.

Oxera has undertaken modelling that measured the proportion of cost of debt risk that is removed by indexation (see Appendix 'What is the link between debt indexation and allowed returns' for ENA commissioned report, and Appendix 'Scenarios Prepared For Scotia Gas Networks' for SGN specific analysis). The modelling confirms that, in theory, indexation can eliminate all the cost of debt risk: however, by relaxing some of the assumptions that are necessary if the cost of debt index is to match exactly the company's actual cost of debt, the residual risk under debt indexation can be quantified. The analysis shows that, if the assumptions necessary for the company to match exactly the cost of debt index do not hold, the company will be exposed to a residual risk of 19 bps from changes in the market cost of debt.

11.2.4 Recommendations

Taking the issuance costs (see Section 11.2.2), together with the risk inherent in the cost of debt index relative to a fixed allowance, (see Section 11.2.3), we propose that an uplift of 60bps for both elements is appropriate.

A paper was submitted from the ENA (on behalf of the gas Networks) to Ofgem in March 2011 covering its response to Ofgem's cost of debt proposals (including new issuance costs) and this can be found in the Appendix 'Cost of Debt Issuance Costs'.

11.3 Assessing Financeability

Raising significant levels of debt in such an uncertain and unprecedented economic climate means that we must firstly be able to attract debt and secondly at an efficient cost.

Therefore, credit metrics are a vitally important sense check that our package leaves Southern Gas Networks financeable.

Credit Rating Agency Perceptions

To date none of the rating agencies have given a clear indication of precisely what ratios they will consider and what threshold levels they will apply for particular credit ratings. As a result, there is considerable uncertainty surrounding the approach they will take under the new RIIO framework. The ratios and thresholds below are almost certainly based on informal discussions with the rating agencies and with investors, but it is important that Ofgem allows some headroom above the ratios suggested below to reflect the uncertain approach rating agencies may take.

Standard & Poor's, in their September 2011 paper on 'How The Proposed RIIO Regulatory Framework Could Affect Ratings On UK Energy Utilities' state:

'We believe that any increase in either business or financial risk resulting from the introduction of the RIIO model, in our view, have implications for our ratings on these utilities.'

They go on to define an increase in financial risk as:

'lower revenues and cashflows in the early years of a price control period without a commensurate reduction in adjusted debt'

Financeability Assessment

We have carried out financeability analysis to determine the impact on credit ratings if certain key variables are flexed, including gearing.

In assessing financeability, Ofgem have presented ranges of credit metrics currently used by the three major credit rating agencies operating in the UK:

	Fitch		Moody's		Standard & Poor's	
	A	BBB	A	BBB	A	BBB
FFO Interest cover (x)	4.0 – 5.0	<4.0	3.5 – 5.0	2.5 – 3.5	>3.5	2.5 – 3.5
PMICR (x)	>1.7	<1.7	2.0 – 4.0	1.4 – 2.0		
FFO / Debt (%)			12 – 20	8 – 12	>12	8 _ 12
Debt / RAV (%)	50 – 65	>65	45 – 60	60 – 75	<70	>70
RCF / Capex (x)			1.2 – 2.5	1.0 – 1.5		

We believe that, consistent with the cost of debt index, ratios between A and BBB should be appropriate for SGN.

The finananceability modelling completed in this Business Plan is based on a level of gearing used for a notional capital structure consistent with the assumptions used in setting the cost of capital. The analysis is therefore based on an assumption of a reasonably efficient level of gearing rather than actual gearing.

The modelling has been based on the following assumptions:

Average Real Vanilla WACC	5.1%
Average Cost of Debt	3.7%
Real Cost of Equity	7.5%
Dividend Yield	5%
Dividend Growth	3%
Initial Notional Gearing	62.5%
Average Inflation	3%
Asset Life	38
Level of Indexed Linked Debt	0%

Our plan must also be financeable from the perspective of equity investors. This means that not only must the cost of equity itself be attractive, but the distributions available to equity must provide a reasonable yield and allow for payback over a reasonable period.

Our plan allows for a 5% cash yield to equity investors. This is at the low end of what our investors will accept and also at the low end of the plausible ranges modelled by regulators in previous price controls such as the analysis presented by Ofgem/Ofwat in the 'Networks Financing' paper in 2006.

RAV growth is based on the level of depreciation discussed in Section 11.4 and the slow money split discussed in Section 11.5. Ofwat and Ofgem in a 2006 joint paper 'Financing Networks' commented that where the RAV is increasing too quickly, significant new injections of debt or equity finance will be required – it is normally assumed that the majority of new finance will come from debt. However, if the requirements are too high, pressure could be put on financial ratios. We are proposing that RAV growth is no higher than the 3% real growth seen in the current price control.

Based on our totex requirements over the eight years as set out in Chapter 10 and the notional capital structure assumptions set out above, below are our financial projections in GD1:

£m Nominal	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Opening RAV		3,338	3,514	3,712	3,904	4,108	4,338	4,579	4,817
Additions (slow money)		306	321	317	330	346	356	365	369
Depreciation		(230)	(228)	(236)	(243)	(239)	(245)	(264)	(283)
Net New Additions		75	93	81	87	107	110	101	86
RAV Indexation		100	105	111	117	123	130	137	144
Closing RAV	3,338	3,514	3,712	3,904	4,108	4,338	4,579	4,817	5,047
Real RAV Growth		2.3%	2.6%	2.2%	2.2%	2.6%	2.5%	2.2%	1.8%
Average RAV		3,426	3,613	3,808	4,006	4,223	4,459	4,698	4,932
Return on Capital		175	182	193	206	218	228	241	257
Recoveries from GDPCR1		5	5	5	5	5	5	5	6
Interest Payable		139	144	153	162	173	184	192	203
Return on Capital after debt servicing		40	43	46	49	51	50	54	60
Dividends		69	72	76	80	84	89	93	98
Return on Capital after dividends		(28)	(29)	(30)	(31)	(33)	(39)	(39)	(39)
Debt Nominal	2,086	2,196	2,324	2,442	2,569	2,718	2,872	3,020	3,155
Indexed Linked Debt	0	0	0	0	0	0	0	0	0
Equity	1,252	1,318	1,388	1,462	1,539	1,621	1,706	1,797	1,892
Debt/RAV %	62.5%	62.5%	62.6%	62.6%	62.5%	62.6%	62.7%	62.7%	62.5%

The resulting credit metrics are as follows:

FFO interest cover		2.9	2.9	2.8	2.8	2.7	2.6	2.7	2.7
PMICR		1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
FFO/Debt		12.3%	11.6%	11.5%	11.4%	10.7%	10.3%	10.5%	10.9%
RCF/Capex		0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7
RCF/Debt		9.2%	8.5%	8.4%	8.2%	7.6%	7.2%	7.5%	7.8%

These ratios fall well short of A rating thresholds and, in some instances, do not meet BBB thresholds.

Index Linked Debt

However, most utilities look to manage a proportion of their debt (and interest rates) by issuing index linked debt where they can attract real rather than nominal interest rates – which are more closely aligned with cashflows.

Assuming an opening level of 25% of index linked debt (which is broadly in line with SGN's level), ratios can be improved. This will rely on rating agencies acknowledging the exclusion of accretion (annual inflation of index linked debt) in the interest element of the ratio calculations (it is unclear from their target ranges above whether they do).

£m Nominal	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Opening RAV		3,338	3,514	3,712	3,904	4,108	4,338	4,579	4,817
Additions (slow money)		306	321	317	330	346	356	365	369
Depreciation		(230)	(228)	(236)	(243)	(239)	(245)	(264)	(283)
Net New Additions		75	93	81	87	107	110	101	86
RAV Indexation		100	105	111	117	123	130	137	144
Closing RAV	3,338	3,514	3,712	3,904	4,108	4,338	4,579	4817	5,047
Real RAV Growth		2.3%	2.6%	2.2%	2.2%	2.6%	2.5%	2.2%	1.8%
Average RAV		3,426	3,613	3,808	4,006	4,223	4,459	4,698	4,932
Return on Capital		175	182	193	206	218	228	241	257
Recoveries from GDPCR1		5	5	5	5	5	5	5	6
Interest Payable		124	128	136	145	155	166	174	183
Return on Capital after debt servicing		56	59	62	66	69	68	73	79
Dividends		69	72	76	80	84	89	93	98
Return on Capital after dividends		(13)	(13)	(14)	(14)	(16)	(21)	(20)	(19)
Debt Nominal	1,565	1,658	1,771	1,873	1,982	2,113	2,249	2,378	2,494
Indexed Linked Debt	522	537	553	570	587	605	623	641	661
Equity	1,252	1,318	1,388	1,462	1,539	1,621	1,706	1,797	1,892
Debt/RAV %	62.5%	62.5%	62.6%	62.6%	62.5%	62.6%	62.7%	62.7%	62.5%
FFO interest cover		3.3	3.2	3.2	3.1	3.0	2.9	2.9	3.0
PMICR		1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4
FFO/Debt		13.0%	12.3%	12.2%	12.0%	11.3%	10.9%	11.2%	11.5%
RCF/Capex		0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7
RCF/Debt		9.9%	9.2%	9.1%	8.9%	8.2%	7.8%	8.1%	8.4%

FFO interest cover starts the period at the low end of the A threshold, FFO to net debt is in the A threshold for most of the period. However, PMICR is only just within the BBB threshold.

Gearing

Gearing of 62.5% is consistent with the current price control and sits between A and BBB thresholds across the three rating agencies. Increasing the level of gearing above the current notional level would put unacceptable strain on these ratios and result in dividends below assumed acceptable yields.

Not withstanding this, we do not believe any factors have significantly changed in GD1 that would justify a notional gearing any higher than set in the current price control. If anything, there are pressures in the other direction as follows:

- At its heart, RIIO aims to provide greater incentives for outperformance and greater downsides for underperformance. As shown in our RORE analysis in (Section 11.6), the higher business risk under RIIO implies that the current level of gearing is appropriate (in fact it implies even lower leverage according to standard financial theory.)
- The absence of index-linked debt makes it more difficult to manage financeability, again increasing long-term business risk.
- Other utilities, such as the electricity transmission companies, have maintained leverage at broadly constant levels over the period since GDPCR1. More generally, leverage of UK companies has decreased over the period as more highly leveraged business models became unsustainable.

- Our need to retain access to debt capital markets has not diminished since GDPCR1. If anything, the last few years have demonstrated the need to be able to access capital markets during periods of financial volatility and that a stronger credit rating assumption may be needed than was previously the case.

Financeability Conclusions

Given the concern expressed by the rating agencies that they have not fully assessed the risk environment under RIIO and the possibility they may not give credit for index linked debt in our cashflows, the ratios this package delivers should be seen as the absolute minimum.

We have carried out a number of scenarios adjusting the following parameters:

- The level of notional gearing
- Fast / Slow money split
- Depreciation levels (including asset life changes)
- Dividend yield

In all situations, a drop in any one parameter below the levels put forward in earlier chapters moves the credit metrics below acceptable levels. We believe this plan provides the minimum financeability requirements to meet our licence obligations.

11.4 Asset Lives and Depreciation Profiles

The capitalisation of replacement expenditure reduces allowed revenue by over £61m per annum. This would produce significantly negative cashflow, result in no dividends for GD1 and would almost certainly prompt a ratings downgrade as key ratios would fall below BBB levels if cashflows were to be brought into line with current levels through increased debt.

In order to produce a stable cashflow required to support credit ratios (not withstanding the WACC parameters) depreciation is the key driver to achieve this. Ofgem have recognised this issue and have put forward several changes to increase depreciation:

- Depreciation profiles (i.e. a move from straight line to front end loaded)
- Backdated depreciation from 2002-2013 to reflect the change above

This provides partial mitigation but Southern Gas Networks needs to be held cashflow neutral to this change and has considered further changes:

- Reducing the period the RAV is depreciated
- Transitional arrangements on the capitalisation of replacement expenditure

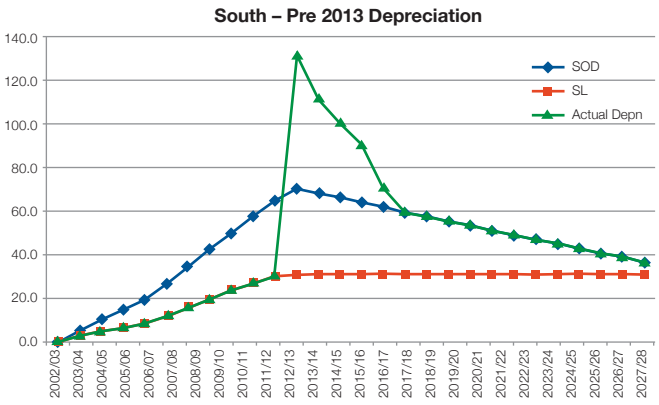
We propose to adjust the period the RAV is depreciated under in order to produce a more predictable and enduring solution. A new period of 38 years has been chosen in order to maintain financeability.

In summary, the adverse allowed revenue position in GD1 resulting from the capitalisation of repex can be largely managed through additional depreciation to preserve credit ratings as follows:

	£m pa
Impact of 100% Capitalisation of Repex	**-61**
Front end loaded depreciation RIIO-GD1	30
Reduced asset lives on post 2002 investment to 38 years	11
Backdating front end loaded depreciation (2002-13)	15
Total Compensating Cashflow	**56**

Depreciation Profiles

As a result of the changes proposed above, the move to front end loaded depreciation (from straight line) increases cashflows for 2002-2013 assets as follows:



11.5 Fast and Slow Money Split

We have assessed the fast / slow money split based on our two networks as follows:

£m 2009/10 prices	GDPCR1 10/11–12/13[2]	GD1 Average
Opex[1]	203	213
Repex	221	255
Capex	117	122
Totex[1]	540	590
Capitalisation rate		
Opex[1]	0%	0%
Repex	50%	100%
Capex	100%	100%
Slow Money to RAV	42%	64%

[1] Analysis excluded £13m of holder demolition costs

[2] GDPCR1 Allowances

We have set our fast/slow money split at a group level, as the two GDNs produce a broadly similar split – 36% fast and 64% slow. The split is a weighted average of the forecast levels of opex, repex and capex, for RIIO-GD1, multiplied by the respective capitalisation rates – as detailed in the table above. This follows the principles for totex calculation set out by Ofgem in its March 2011 Financial Issues Strategy document ([9]).

11.6 Return on Regulated Equity (RORE)

Having established an appropriate cost of equity range and financeability parameters, we have used RORE to determine whether the overall package delivers suitable risk and reward ranges.

Ofgem have stated in their March decision document that the expected variations in RORE lie within a range of 5% – 11% based on a gearing of 60%. If a company can maintain a gearing of 70%, Ofgem believe, through outperformance, this range could widen to 4% – 12%.

Our RORE requirements are supported by AMP Capital who stated in their response to the December consultation that:

"…the institutional private investors who are currently invested in the energy networks had an original equity return expectation of 12% - 15% (nominal), including a cash yield of c.7%-8%...[and]upside/downside returns for good/poor performance should be in the following nominal ranges:

- *Poor performance: below 11% with no bottom limit*
- *Average performance: 11%*
- *Good performance: 13%-15% "*

We have run various plausible upside and downside totex performance scenarios whilst flexing the key parameters of RORE (namely baseline cost of equity, IQI sharing factors and the incentive package) to determine combinations that deliver the ranges set out by Ofgem.

In assessing the package, we have initially modelled the parameters put forward in Ofgem's March Strategy Document. Ofgem's base cost of equity is assumed at 7.2% which is at the top of their range. Ofgem also modelled a range of outperformance for opex and capex of +/- 10% and +/- 20% for repex (including a risk incentive). We have adopted these ranges with the exception of repex where we have assumed +/- 10% based on the guidance received from Ofgem and HSE subsequent to Ofgem's March Strategy Document. We have used the top end of Ofgem's IQI sharing factor of 60% and assessed performance against the incentive package put forward.

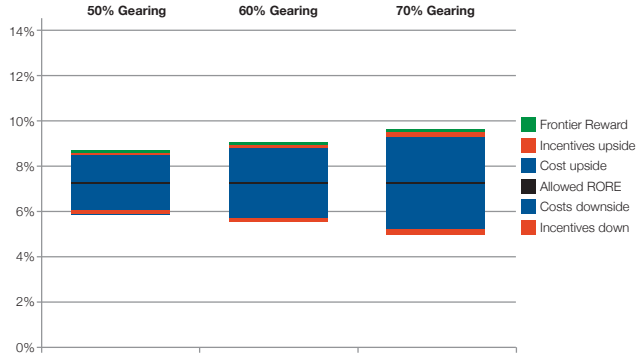
While we have carried this analysis out at an individual network level, due to the sculpting of RAVs that occurred when Transco's price control was separated in 2003 it is clear this is artificially distorting the REREs as the impact of this sculpting has not significantly unwound yet.

£m (2000 prices)	Scotland	Southern	SGN
Original RAV	902	1,603	2,505
Sculptured RAV	671	1,833	2,504
% Change	(26%)	14%	0%

We estimate that REREs could be distorted by +/- 0.5%: however, as these adjustments net off for SGN when the two networks are combined, we have also carried this analysis out at a consolidated SGN level.

[9] Ofgem March 2011 'RIIO-T1 and GD1 Financial Issues, p58

Based on Ofgem's proposed parameters, we believe the potential RORE for SGN is as follows;

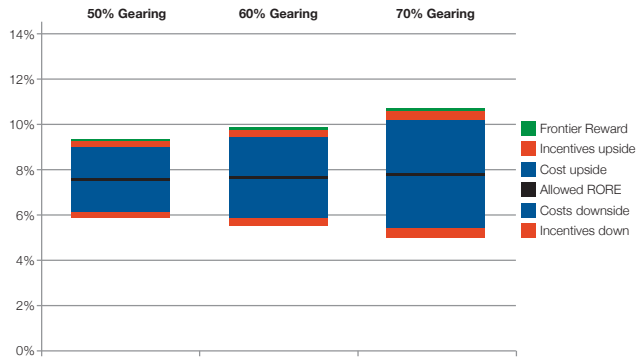


The maximum RORE is below 10% which falls well short of 12%. We therefore have run sensitivities on the IQI sharing, cost of equity and level of incentives.

In the chart below, we have set out in Column A the requirement if only one of these variables is adjusted. Since each item on its own requires an extreme financeability metric, we are proposing a combination of adjustments which we have set out in column B.

	A Adjust only one	B Proposed Combination		RORE Result
IQI Sharing Factor	> 100%	70%	Gearing of 60%	5.6%–9.7%
Incentive Package*	£47m	£7m		
Cost of Equity	9.7%	7.5%	Gearing of 70% based on ability to outperform	4.9%–10.4%

The proposed combination of parameters provides the following RORE ranges;



IQI Sharing

Therefore we conclude that to achieve the required RORE range, the IQI sharing put forward by Ofgem of 50% – 60% is not sufficient and our plan proposes 70% (See Section 11.7).

A sharing factor of 70% will come at the cost of introducing more risk into the business.

Incentives

In order to potentially move closer to the top end RORE range we will also require a significantly enhanced incentives package than the package proposed by Ofgem. We have calibrated the package giving a plausible range of +/- £4.4m for Southern Gas Networks. The table below summarises incentives that we believe are relevant and appropriate and support this plausible range:

	Southern	
Incentives £m per annum	**Ofgem Proposals**	**Plausible Maximum Range**
EEI/Shrinkage	1.2	1.2
Customer Service		
Customer Satisfaction	0.2	
Complaints Handling	0.0	
Stakeholder Engagement	1.1	
	1.3	1.3
Discretional Reward Scheme		
Core proposal by Ofgem	0.2	
Priority Customers	SGN Proposal	
Social Obligations	SGN Proposal	
Non Leakage BCF	SGN Proposal	
		0.7
Carbon Monoxide	SGN Proposal	1.2
Total before IQI sharing	2.7	4.4
Less sharing of EEI (0% IQI)	(0.5)	SGN Propose no sharing
Total Incentives	2.2	4.4

In the Final Proposals for DPCR5 ([10]) Ofgem state a plausible upside return (recognising that a DNO cannot 'max out' on all incentives across 5 years) of 10-13%. Our proposed adjustments would deliver the potential for double digit returns but it should be noted that greater totex outperformance (in line with Ofgem's original assumptions), and further incentives (even above our proposals), would be required to achieve 12%.

[10] Chapter 4 'Risks and Rewards' of Ofgem's Electricity Distribution Price Control Review Final Proposals (Ref 144/09, December 2009)

11.7 Sharing Factors (IQI)

In order to provide appropriate incentives to earn 12% RORE, a good performing DN will need to retain 70% of any outperformance.

This can be achieved either by:

- Setting the incentive strength on the IQI matrix to 70% for aligning with Ofgem forecasts
- Or, setting the incentive strength to 60%, for asset related expenditure, and allowing 100% retention of outperformance on business support / work management / other direct activities, non operational capex and statutory decontamination and holder demolition

It is recommended that the latter option is chosen in order to create a strong incentive for expenditure that is not asset related and this is consistent with DPCR5.

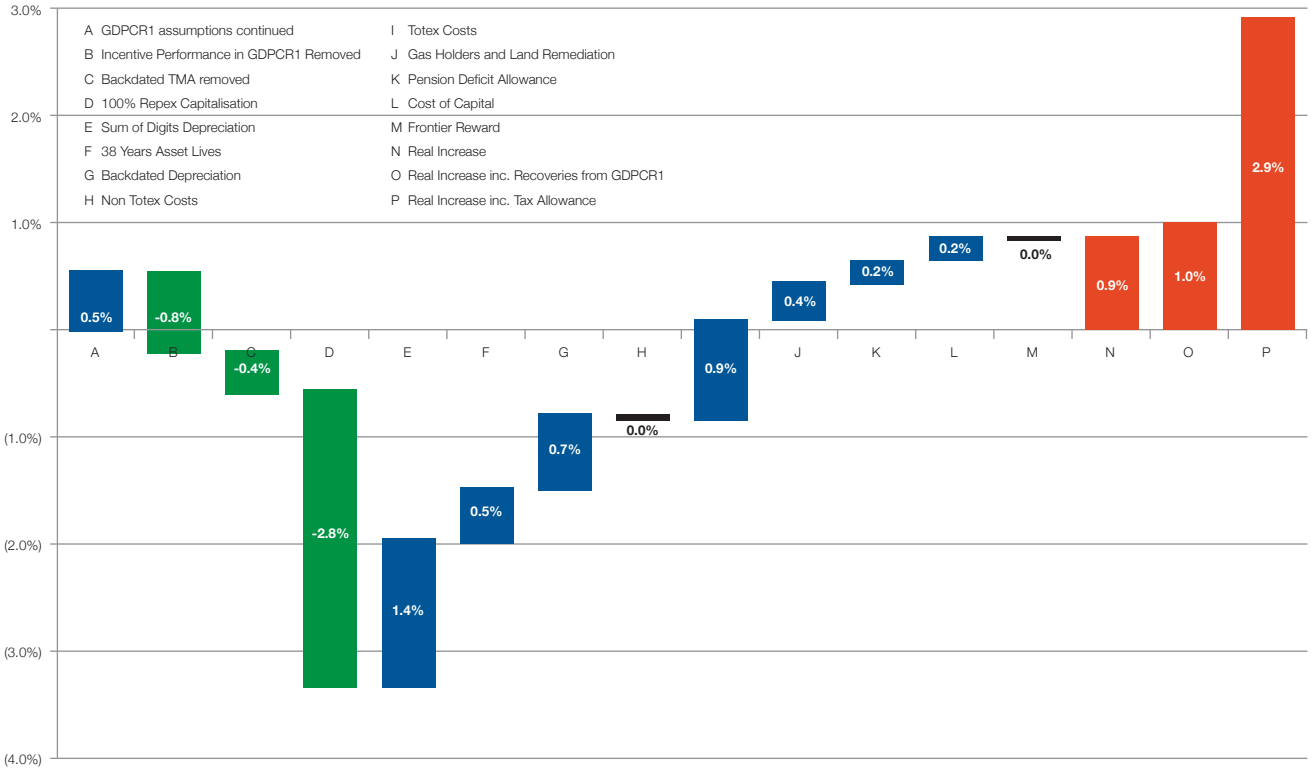
Expenditure Subject to IQI (60%)	£m pa
Opex	111
Repex	255
Capex	87
Totex (asset related)	**453**
Expenditure Subject to 100% Strength	
Opex (Bus Support/Work Magt/Other Direct Activities)	96
Non Operational Capex	35
Holders/Environmental	19
Totex (non-asset related)	**149**
Total Expenditure	**603**
Weighted Average IQI	**70%**

Based on this analysis we recommend an IQI sharing of 70%.

11.8 Impact on Customers

The impact of our Business Plan on allowed revenue is an increase (in real terms) from £552m in 2012/13 to an average of £571m in RIIO – GD1 (excluding recoveries from GDPCR1 and change in tax following the introduction of IFRS). This equates to an average daily increase of well under one pence per day during RIIO – GD1 (average annual increase of RPI + 0.9%).

The annual increase of RPI + 0.9% is made up of the following items;



The recovery of tax is a significant item (£42m pa on average) within the allowed revenue and can be considered out side of our control. It should be noted that the allowed revenue analysis above excludes any charges relating to NTS Exit Capacity.

11.9 Ofgem policy

11.9.1 Pensions

GD1 allows for the true up of the efficient difference between actual and allowed pension costs (ongoing and deficit repair) – as detailed in Ofgem's March 2011 Financial Issues Strategy document ([11]).

In GDPCR1, we were allowed £8m per annum to fund its deficit repair costs. This was based on Southern's share of a scheme deficit of circa £100m.

A valuation was carried out in March 2009 which set the deficit at £256m – following discussions between the company and the trustees of the pension scheme, deficit repairs of £23.5m per annum were agreed to commence in 2010/11, plus a one off payment of £20m in 2010/11. Southern contributes approx 60% of this.

This has resulted in £25m more deficit repair payments being made in the current price control period over allowances:

£m 9/10 prices	2008 /09	2009 /10	2010 /11	2011 /12	2012 /13	Total
Allowed	10	4	9	9	9	41
Actual	8	8	25	13	12	66
Variance	2	(4)	(16)	(4)	(4)	(25)

Our Business Plan assumes recovery of these deficit payments over the eight year GD1 period, consistent with the guidelines set out in Ofgem's March 2011 Strategy Document.

It has been assumed that the ongoing rate of 37.5% and deficit repair payments of £23.5m (£14m per annum in South) will continue and have been incorporated into our core Business Plan proposals

11.9.2 Fuel Poor Connections

In the current price control SGN has committed to connecting a minimum of 10,000 fuel poor customers across its two networks. Ofgem have agreed that the allowances given to these customers (circa £1600 per connection) should be recovered through the RAV in future price controls. SGN estimate that this figure will be £4m by April 2013 in Southern and these amounts have been included in our projected RAV going forward.

11.9.3 Tax

Southern Gas Networks is forecast to have actual tax losses of £114m at the start of GD1. However, we are proposing some adjustments are made in order to calculate regulatory losses to be used in our financial projections:

- Tax losses arising from normal business incurred prior to 2007/8 should be excluded as these occurred during a pre-tax cost of capital regime. The losses incurred during the period were £38m.
- Not withstanding the point above, tax losses generated by an onerous swap provision of £149m in 2005 should be excluded – SGN currently pay £14m per annum as a result of these swaps which is not funded by customers but by shareholders. We therefore propose these losses are removed.
- SGN currently surrenders 50% of losses to Scottish and Southern Energy – Ofgem's guidance states that surrendered losses should be added back in calculating regulatory losses.

Following these adjustments, regulatory losses carried forward in this plan are nil;

	£m
Actual tax losses as at 31st March 2007	187
Less SWAP losses	(149)
Less other tax losses from pre tax regime	(38)
Regulatory Tax losses as at 31st March 2007	0
Forecast tax losses between 2007/08 and 2012/13	0
Forecast regulatory tax losses as at 31st March 2013	0

Deloitte have provided advice supporting our tax proposals in this section. Deloitte's paper is available on our website.

[11] Ofgem March 2011 'RIIO-T1 and GD1 Financial Issues, p51

12

Governance

12.1 Governance and Process

The Business Plan has been developed following extensive engagement with our stakeholders, ranging from the HSE and Ofgem to shippers and to the end domestic consumer. We have listened to all of our stakeholders to ensure we form a balanced view as we have developed this Business Plan; one that ensures we continue to meet our statutory requirements whilst providing real value for money for our customers.

Governance Structure

The RIIO-GD1 project governance structure was set up and agreed at Board level in July 2010 to ensure clarity of roles and responsibilities along with a formal and accountable reporting structure.

An overview of the project structure is provided below.

<table>
<tr><td colspan="3">SGN
Board
Provides strategic direction</td><td>Bi-monthly updates to Board</td></tr>
<tr><td colspan="3">RIIO–GD1 Project Board
Approves main submissions under delegated authority of the SGN Board</td><td>Meets monthly</td></tr>
<tr><td colspan="3">Regulatory Strategy Group
Ensures regulatory compliance and balances shareholders’ needs with customers’ value for money</td><td>Meets bi-weekly</td></tr>
<tr><td>Finance & Regulatory Strategy</td><td>Stakeholder Engagement Strategy</td><td>Investment & Network Strategy</td><td>Development of investment plan, Incentives & outputs</td></tr>
</table>

Board Endorsement

Through the above project structure, the Board of SGN has been fully engaged in the development of this Business Plan.

The Board is fully committed to the strategic direction outlined in this Business Plan and believes that the proposals set out herein will deliver the company’s strategic vision whilst providing real value for money for our customers.

Gregor Alexander
Chairman, Scotia Gas Networks

12.2 Third Party Reports and Endorsements

In development of this Business Plan we have engaged independent consultants to assess and review key policy areas. Each of this are highlighted below and discussed in the relevant Chapters and Appendices of this Business Plan.

All third party reports are available on our website.
Jacobs Engineering UK Ltd has reviewed and fully endorsed both our capital investment programme and our pipe risk management strategy. The report is referred to in Chapters 3 and 4 of this Business Plan.

Energy and Utility (EU) Skills has produced a report on Gas Distribution Networks – Workforce Plans 2011 to 2025: The Skills Landscape and Challenges. The report is referred to in Chapter 8 and Appendix O of this Business Plan.

Gartner Consulting has prepared an IT leader scorecard and provided an IT spending and staffing report, both referred to and summarised in Chapter 9 and Appendix P of this Business Plan.

Oxford Economics has provided an assessment of our input cost forecasts (real price effects). This is discussed in Chapter 10 regarding the efficiency of our business.

Accent has produced a report on regional variations in customer satisfaction that is referred to in Chapter 10 and Appendix Q.'

Deloitte LLP has prepared a report on direct and contract labour regional factors for RIIO-GD1 which we discuss in Chapter 10 and Appendix Q.

First Economics has prepared a report on the Scope for Future Productivity Growth which is discussed in Chapter 10.

Oxera has prepared a series of reports on the cost of equity, the cost of debt and risk as follows:

- What is the Cost of Equity for RIIO-T1 and RIIO-GD1;
- What is the link between debt indexation and allowed returns;
- Scenarios Prepared For Scotia Gas Networks; and
- Impact of risk on cost of capital and gearing

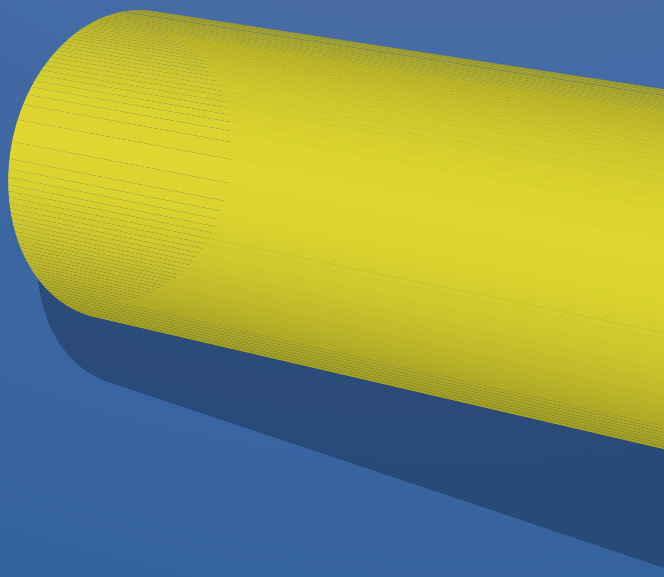
All of these reports are discussed in Chapter 11. In addition, the ENA has prepared a report on the 'Cost of Debt Issuance Costs' which we also discuss in Chapter 11. Finally, Deloitte has produced an 'Appendix supporting the tax numbers included within Scotia's Business Plans for RIIO-GD1' which is also discussed in Chapter 11.

Glossary of Terms for Business Plan

°C	refers to a thermodynamic temperature scale, the particular interval between the temperature in Kelvin and the temperature 273.15 Kelvin as defined in ISO 1000-1992(E);
ACPO NSI	Association of Chief Police Officers – National Security Inspectorate;
AESL	Advanced Engineering Solutions Limited;
ARC	Alarm Receiving Centre;
Bar	the bar as defined in ISO 1000-1992(E);
BCF	Business Carbon Footprint;
Calorific Value	that number of Megajoules produced by the complete combustion at a constant absolute pressure of 1.01325 bar of 1 Cubic Metre of gas at a temperature of 15°C with excess air at the same temperature and pressure as the gas when the products of combustion are cooled to 15°C and when the water formed by combustion is condensed to the liquid state and the products of combustion contain the same total mass of water vapour as the gas and air before combustion; and for the avoidance of doubt calorific value shall be REAL as defined in ISO 6976-1:1995(E);
Capex	Capital Expenditure;
Cathodic Protection	a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell;
CCS	Carbon Capture and Storage;
CCTV	Closed Circuit Television – camera based security system;
CEPA	Cambridge Economic Policy Associates ;
CHP	Combined Heat and Power;
Churn	staff turnover rates;
CNG	Compressed Natural Gas;
CO	“carbon monoxide” – is a colourless, odourless, and tasteless gas that is slightly lighter than air. CO is formed by the incomplete combustion of carbon and is highly toxic to humans and animals.
CO_2	carbon dioxide – a naturally occurring chemical compound composed of two oxygen atoms covalently bonded to a single carbon atom. It is a gas at standard temperature and pressure, it is one of the “greenhouse” gases;
COMAH	Control of Major Accident Hazard Regulations 1999
Competent Authority	means the Gas and Electricity Markets Authority, Ofgem, or any local, national or supra national agency, authority, department, inspectorate, minister, ministry, court, tribunal or official or public or statutory person (whether autonomous or not) of, the United Kingdom (or the government thereof) or of the European Union which has jurisdiction over SGN or the DFO or the subject matter of this Agreement;
CPNI	Centre for the Protection of National Infrastructure;
CSV	Composite Scale Variables;
Cubic Metre or m3	when applied to gas, that amount of gas which at a temperature of 15°C and an absolute pressure of 1.01325 bar and being free of water vapour occupies one 1 cubic metre;
CWV	Cold Weather Variable – factor used in creating gas demand forecasts;
DCC	Data Communication Company – a central co-ordinator of metering information proposed for the delivery of “smart metering”;
Depreciation	The measure of the amount of benefits of a fixed asset consumed during the period;
DFO	Delivery Facility Operator;
Directive	shall mean any present or future directive, request, requirement, instruction, code of practice, direction or rule of any Competent Authority, (but only, if not having the force of law, if it is reasonable in all the circumstances for it to be treated as though it had legal force) and includes any modification, extension or replacement thereof;
DRS	Discretionary Reward Scheme;
DSEAR	The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) require employers to control the risks to safety from fire and explosions;
Easement	Legal agreement pertaining to right of access to a piece of land;
EEI	Environmental Emissions Incentive;
EMIB	Energy Markets Issues for Biomethane – group tasked with identifying the barriers that are slowing down the commercial development of biomethane projects in the UK;
ENA	Energy Networks Association;
EPA	Environment Protection Agency;
EU	European Union;
FCO (s)	First Call Operative(s);
‘Force majeure’	Contract clause to protect the parties in the event that a segment of the contract cannot be performed due to causes that are outside the control of the parties, such as natural disasters;
Fuel Poor	When a household needs to spend more than 10% of its income to maintain adequate heating in a home.

Gas Act	shall mean the Gas Act 1986 (as amended) and any regulations issued thereunder, as such Gas Act and regulations are amended or supplemented from time to time;
Gas Transporter	shall mean a holder of a gas transporter licence granted (or treated as granted) under section 7(1) of the Gas Act, together with any successor or assignee thereof;
GCC	Gas Control Centre – responsible for remote monitoring and control of the gas network;
GD1	Gas Distribution price control period 2013 to 2021;
GD2	Price control period after GD1;
GDN	Gas Distribution Networks;
GDPCR1	Current Gas Distribution Price Control Period 2008 to 2013;
GEMA	Gas and Electricity Market Authority – determines strategy, sets policy priorities and takes decisions on a range of matters, including price controls and enforcement. The Authority's powers are provided for under the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998 and the Enterprise Act 2002;
GIRS	Gas Industry Registration Scheme;
GS(M)R	Gas Safety Management Regulations 1996;
GSOS	Guaranteed Standards of Service;
GWh	shall mean GigaWatt hour or one million (1,000,000) kWh;
ICS	Institute of Customer Service;
iDN(s)	Independent Distribution Networks;
IFI	Innovation Funding Incentive;
IGNITE	Our internal ideas management scheme;
iGT	Independent Gas Transporter;
Indirect Costs	these costs represent corporate type functions, and are separated into: Research and Development; IT; Finance; Procurement; HR; Insurance; Training; Property Management; CEO and Corporate;
IP	Intermediate Pressure Distribution System (2Bar to 7Bar);
ISO14001	International Standards Organisation Environment Management Systems and Standards;
ISO9001	Quality Management System ISO9001:2008;
IT	Information Technology;
KPI(s)	Key performance Indicators;
kWh	shall mean a kiloWatt hour or three million six hundred thousand (3,600,000) Joules;
Licence	shall mean the Gas Transporter's licence treated as granted to SGN as modified from time to time;
LNG	Liquefied Natural Gas;
LP	Low Pressure Distribution System (<75mbar);
LPG	Liquefied Petroleum Gas;
LTS	Local Transmission System (7Bar to 69Bar);
MEAV	the Modern Equivalent Asset Value is the cost of creating an equivalent new network and it essentially captures a weighted average of the GDNs asset volume;
MP	Medium Pressure Distribution System (75mbar to 2Bar);
MRPGas	Mains Replacement Decision Support Tool;
MRPS	Mains Risk Prioritisation System;
Natural Gas or Gas	shall mean any hydrocarbons or mixture of hydrocarbons and other gases consisting primarily of methane which at Standard Temperature and Standard Pressure are or is predominantly in the gaseous state;
NEP	Embedded Network Entry Point;
NG NTS	National Grid – a company that manages the national gas transmission systems;
NIC	Network Innovation Competition; Non-Routine Maintenance Non Routine Maintenance activities are those which are irregular in both timing and costs, and have a material effect on cost from year to year. Typically the requirement to carry out these activities should arise between 2 – 6 years, i.e. activities are known, but not likely to happen on an annual basis;
NTS	National Transmission System;
OAD	Offtake Arrangements Document, specific document within the Uniform Network Code;
Ofgem	The Office of Gas and Electricity Markets – UK gas and electricity regulator – Ofgem is governed by an Authority (GEMA). The principal objective is to protect the interests of existing and future consumers in relation to gas conveyed through pipes and electricity conveyed by distribution or transmission systems. The interests of such consumers are their interests taken as a whole, including their interests in the reduction of greenhouse gases and in the security of the supply of gas and electricity to them;
OLI	On Line Inspections;

OM	Operating Margins gas, associated with the orderly run down of the network in the event of a national gas emergency.;
Ombudsman Services: Energy	Organisation that helps to resolve complaints from consumers about energy (gas and electricity) companies. They are approved by Ofgem, the UK gas and electricity regulator under the Consumers Estate Agents and Redress Act 2008;
Opex	Operating Expenditure;
OUG	Own Use Gas;
PAM	Personal Atmosphere Monitor;
PEPSI	Process Engineering Performance Safety Indicators;
PRS	Pressure Reduction System;
PSR	Pipeline Safety Regulations 1996;
RCM	Reliability Centred Maintenance programme;
Relative Density	shall mean the mass of a volume of dry gas divided by the mass (expressed in the same units) of an equal volume of dry standard air as defined in ISO 6976-1:1983(E) both such gases being at a temperature of 15°C and an absolute pressure of 1.01325 bar; and Relative Density (REAL) shall for the avoidance of doubt be REAL as defined in ISO 6976-1:1995(E);
Repex	Replacement Expenditure;
RIIO-GD1 or GD1	The first gas distribution price control to reflect the new RIIO (Revenue = Innovation + Incentives + Outputs) model for the period 2013-2021;
RORE	Return on Regulated Equity;
Routine Maintenance	can be described as those activities that are recurring and largely predictable in both costs and timing. There should be an immaterial year on year movement in the cost of routine maintenance. These costs include property cost associated with operational assets;
RPEs	Real Price Increases over and above Retail Price Index;
RPI	Retail Price Index;
Safety Case	shall mean the safety case of SGN prepared in accordance with the Gas Safety (Management) Regulations 1996, specifically Regulations 2(5) and 3(1)(a);
SBGI	Society of the British Gas Industries;
SCADA	Supervisory Control and Data Acquisition systems;
SEPA	Scottish Environment Protection Agency;
SGN	Scotland Gas Networks or Southern Gas Networks or Scotia Gas Networks (context dependent);
Shrinkage	Shrinkage is gas lost from our networks as a result of leakage, theft of gas (TOG) and own use gas (OUG) used by us in the course of operating and maintaining our networks.
SIA	Security Industry Authority;
SIU(s)	Scottish Independent Undertakings – are discrete geographic areas of gas supply and comprise the towns of Wick, Thurso, Oban, Campbeltown and Stornoway;
System	shall mean the pipeline system operated by SGN in the Southern Gas Network area for the conveyance of Gas through which is authorised by the licence granted to SGN as a Gas Transporter;
System Capacity	has the meaning as specified within the section B1.2.1 of the Transportation Principal Document within the Uniform Network Code;
System Control	control process is to ensure the safe flow of gas through the network, ensuring the supply is sufficient to meet the demand of gas on a daily basis;
TMA / T(S)A	Traffic Management Act 2004 – an Act to make provision for and in connection with the designation of traffic officers and their duties; to make provision in relation to the management of road networks; to make new provision for regulating the carrying out of works and other activities in the street; to amend Part 3 of the New Roads and Street Works Act 1991 and Part 9 and 14 of the Highways Act 1980; to make new provision in relation to the civil enforcement of traffic contraventions; to amend section 55 of the Road Traffic Regulation Act 1984;
TOG	Theft of Gas;
Totex	Total Expenditure;
UIP	Utility Infrastructure Provider;
Uniform Network Code or UNC	means the Uniform Network Code prepared by SGN (together with the other relevant gas transporters) pursuant to Standard Special Condition A11(6) of their gas transporters' licences (as amended from time to time);
WACC	Weighted Average Cost of Capital;
Wayleave	Legal agreement pertaining to right of access to a piece of land;
Work Management Costs	These costs can be split into four further categories: Asset Management; Operations Management; System Control; Customer Management;



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