

# RIIO-GD1: Supporting document – Outputs, incentives and innovation

## Consultation

**Reference:**

**Publication date:** 27 July 2012

**Response deadline:** 21 September 2012

**Contact:** James Grayburn, Head of RIIO-GD1

**Team:** RIIO-GD1

**Tel:** 020 7901 7483

**Email:** James.grayburn@ofgem.gov.uk

**Overview:**

This Supporting Document to the main consultation document sets out our initial proposals on the outputs that the network companies will need to deliver over the RIIO-GD1 price control period, and the associated incentive mechanisms. This document is aimed at those seeking a detailed understanding of our proposals. Stakeholders wanting a more accessible overview should refer to the main consultation document.

## Associated documents

---

### **Main consultation paper**

[RIIO-GD1: Initial Proposals - Overview](#)

### **Supporting documents**

[RIIO-GD1: Initial Proposals – Supporting document – Cost efficiency](#)

[RIIO-GD1: Initial Proposals – Supporting document – Finance and uncertainty](#)

### **Associated documents**

[RIIO-T1/GD1: Initial Proposals – Real price effects and ongoing efficiency appendix](#)

[RIIO-GD1: Initial Proposals – Impact assessment](#)

[RIIO-T1/GD1: Financial model](#)

[Cost of capital study for RIIO-T1 and RIIO-GD1](#)

### **Licence consultation documents**

[RIIO-T1 and RIIO-GD1: Draft licence conditions – First informal licence drafting consultation](#)

[Supporting Document 3: Draft RIIO-GD1 Gas Distribution licence changes](#)

[Supporting Document 4: Response template for RIIO-T1 & GD1-First licence drafting consultation](#)

[RIIO GD1 Price Control Financial Handbook](#)

### **Other associated documents**

[RIIO-GD1: Initial Proposals for Gas distribution networks \(GDNs\) - Headlines](#)

[Initial Assessment of RIIO-GD1 business plans and proportionate treatment](#)

[Decision on strategy for the next gas distribution price control – RIIO-GD1](#)

[Handbook for implementing the RIIO model - Ofgem, October 2010](#)

[Glossary for all the RIIO-T1 and RIIO-GD1 documents](#)

# Contents

---

<b>1. Introduction</b>	<b>5</b>
Structure of the suite of documents	5
Summary of key proposals	6
Ensuring output delivery	8
Innovation	9
Structure of document	9
<b>2. Environmental outputs</b>	<b>10</b>
Introduction	10
Broad environmental measure	11
Information provision and connection charging for distributed gas	13
Shrinkage	14
Business Carbon Footprint (BCF) excluding shrinkage	16
Other emissions and natural resource use	17
<b>3. Customer service</b>	<b>18</b>
Introduction	18
Customer satisfaction survey	19
Complaints metric	21
Stakeholder engagement	25
Revenue associated with customer service output measures and incentive mechanism	26
<b>4. Social outputs</b>	<b>27</b>
Fuel poor network extension scheme	27
Carbon monoxide awareness	29
Stakeholder engagement	30
<b>5. Connections</b>	<b>32</b>
<b>6. Safety outputs</b>	<b>34</b>
Introduction	34
Iron mains safety risk reduction	35
Other safety risk primary outputs	42
<b>7. Reliability outputs</b>	<b>44</b>
Loss of supply	44
Network capacity	45
Network reliability	48
<b>8. Encouraging innovation</b>	<b>55</b>
Introduction	55
Network Innovation Allowance (NIA)	56
<b>Appendices</b>	<b>59</b>
<b>Appendix 1 - Consultation Response and Questions</b>	<b>60</b>
<b>Appendix 2 - Summary of outputs, secondary deliverables, and monitoring/enforcement</b>	<b>63</b>
<b>Appendix 3 – Rolling incentive mechanisms</b>	<b>67</b>

Option A	67
Option B	71
<b>Appendix 4 – Customer service and fuel poor network connections</b>	<b>73</b>
Customer satisfaction trial data analysis	73
Complaints trial data analysis	74
Revenue associated with broad measure incentive	75
Fuel poor network connections	75
<b>Appendix 5 – Connections</b>	<b>77</b>
<b>Appendix 6 - Dealing with uncertainty and investment appraisal</b>	<b>79</b>
Dealing with uncertainty in investment appraisal	79
Assessment of GDNs’ iron mains investment appraisal	83
Gasholder decommissioning	84
<b>Appendix 7 - Safety and environmental outputs and secondary deliverables</b>	<b>86</b>
Primary risk output	86
Secondary deliverables	87
Tier 2 risk action thresholds	90
Shrinkage output levels	91
<b>Appendix 8 - Network Innovation Allowance</b>	<b>94</b>
WWU’s NIA	94
SGN’s NIA	95
NGN’s NIA	95
NGGD’s NIA	97
<b>Appendix 9 - Guidance on aspects of GDNs’ investment appraisal (Published March 2012)</b>	<b>98</b>
Identification of options	99
Identification and quantification of costs and benefits	99
Period for discounting costs and benefits	101
Assessing risks and uncertainties, and sensitivity analysis	102
Decision rule	103
Affordability	105
Links to business plan	105
<b>Appendix 10 – End of period assessment of asset health, capacity secondary deliverables, and safety risk output</b>	<b>107</b>
Evaluation of GDNs’ asset health/risk metrics (or NOMs)	107
Safety risk (MPRS) primary output	110
The capacity outputs incentive mechanism for GDNs	110

# 1. Introduction

---

## **Chapter Summary**

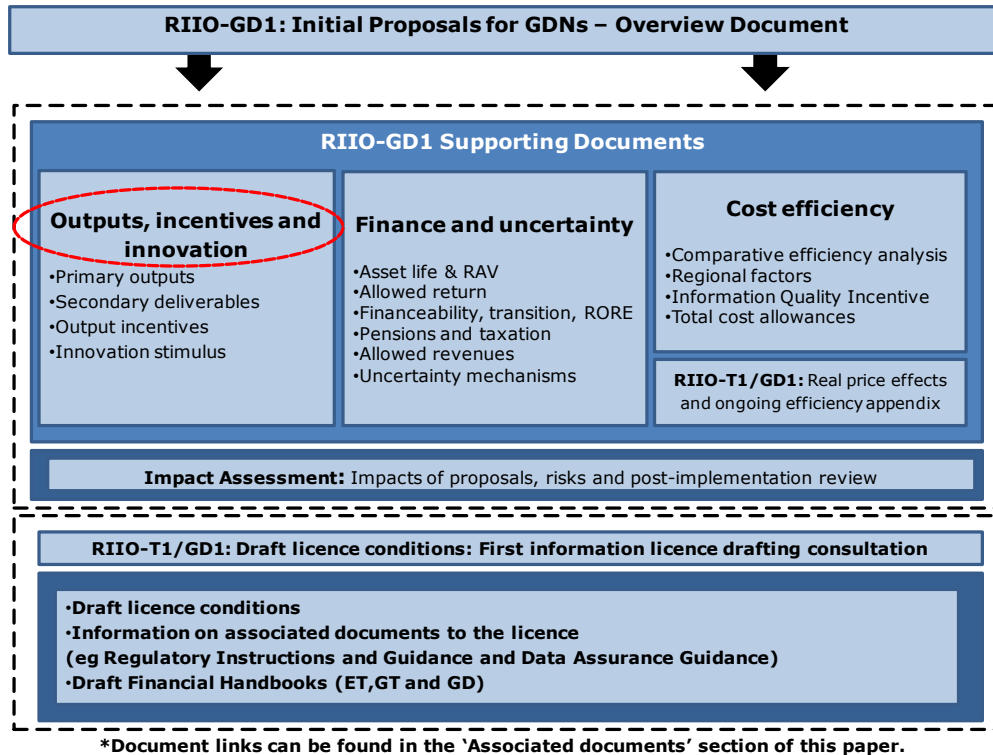
This chapter summarises the comprehensive set of output definitions and levels that we propose for RIIO-GD1 based on our assessment of Gas Distribution Networks' (GDN) business plans and feedback from stakeholders. We provide more details in the following chapters. We also discuss how we will monitor, incentivise and enforce output delivery.

There are no specific questions in this chapter.

## **Structure of the suite of documents**

- 1.1. This document sets out in detail the output definitions and associated incentive mechanisms that we propose the gas distribution network companies (GDNs) be required to deliver over the RIIO-GD1 price control (April 2013-March 2021). It is aimed at those seeking a detailed understanding of our initial proposals for RIIO-GD1. Stakeholders wanting a more accessible overview should refer to the RIIO-GD1 overview paper.
- 1.2. This document is one of three annexes to the main consultation document. Figure 1.1 below provides a map of the RIIO-GD1 documents published as part of the suite of consultation documents.

Figure 1.1 RIIO-GD1 document map\*



## Summary of key proposals

- 1.3. The adoption of an outputs based framework is a key element of the new RIIO framework. By defining the outputs companies need to deliver (eg risk-removed), instead of prescribing a set of inputs (eg length of mains abandoned), the framework provides incentives for companies to innovate and deliver the services that customers require at least cost. An outputs based framework also provides greater transparency for customers (as well as companies) in relation to the services companies need to deliver.
- 1.4. For RIIO-GD1, we have identified a comprehensive set of outputs that we require companies to deliver, and associated incentive mechanisms which reward (or penalise) companies for their output performance.
- 1.5. The following table provides a high-level summary of our proposed outputs. These are consistent with the outputs set out in our March Strategy Document. However, in some instances, we are consulting on an additional level of detail.

**Table 1.1: Summary of proposed outputs**

Policy area	March Strategy Document	Further issues for consultation
Environment (broad measure) <sup>1</sup>	<ul style="list-style-type: none"> <li>- GDNs to report on percentage of biomethane capacity connected to networks</li> <li>- discretionary reward scheme (DRS) for companies that deliver environmental outputs not funded at price review</li> <li>- new connection standards and provision of information for biomethane connections</li> <li>- we will consider connection boundary and charging arrangements for biomethane in a separate process</li> </ul>	<p>No further issues for consultation. We set out progress in relation to:</p> <ul style="list-style-type: none"> <li>- information provision</li> <li>- connection standards for entry (eg biomethane) capacity</li> <li>- changes to connection boundary and charging arrangements</li> </ul>
Environment (narrow measure) <sup>2</sup>	<ul style="list-style-type: none"> <li>- strengthened shrinkage allowance and Environmental Emissions Incentive (EEI); to align carbon value with Department of Energy and Climate Change (DECC)'s non-traded carbon value, and to remove caps/collars on the EEI</li> </ul>	<p>Consulting on:</p> <ul style="list-style-type: none"> <li>- detailed rolling incentive mechanism</li> <li>- extension of rolling incentive mechanism to commodity costs (ie the shrinkage uncertainty mechanism)</li> </ul>
Customer service	<ul style="list-style-type: none"> <li>- Broad measure of customer service, comprising customer satisfaction survey, complaints metric, and discretionary reward for stakeholder engagement</li> </ul>	<p>Consulting on the detailed structure of the mechanism, including:</p> <ul style="list-style-type: none"> <li>- weightings applied to constituent elements of survey, and complaints metric</li> <li>- performance levels at which GDNs incur penalties/earn rewards</li> <li>- weighting (as percentage of total revenues) applied to the stakeholder engagement element of the broad measure</li> </ul>
Social obligations	<ul style="list-style-type: none"> <li>- support activities that raise awareness of carbon monoxide (CO) poisoning and the fuel-poor network extensions scheme</li> <li>- DRS for companies delivering outputs in relation to social objectives not funded at review</li> </ul>	<p>Consulting on:</p> <ul style="list-style-type: none"> <li>- fuel poor networks output (ie connection) levels</li> <li>- proposed CO output/secondary deliverables, ie increasing CO awareness,</li> </ul>
Customer connections	<ul style="list-style-type: none"> <li>- maintain current guaranteed standards</li> <li>- new connection standards of service for distributed gas entry customers during RIIO-GD1</li> </ul>	<p>No further issues for consultation</p>

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

Policy area	March Strategy Document	Further issues for consultation
Safety	Confirmation of primary outputs and secondary deliverables, including iron mains risk removed	Confirmation of output definitions and levels. For example, for risk removed, we propose to require GDNs to realise 30-60% improvements in iron mains safety risk (as measured by MPRS). We have also set out secondary deliverables associated with the primary risk removed output
Reliability	Confirmation of primary outputs and secondary deliverables, including: (i) duration of interruption; (ii) achieving 1 in 20 capacity obligation; (iii) maintaining operational performance	Confirmation of these output measures, and proposed levels where applicable, eg number & duration of interruptions

*Note: (1) We define "broad environmental measure" as the contribution the company makes to wider (ie Great Britain (GB)) environmental objectives, eg the facilitation of biomethane connection which contributes to the UK's carbon reduction targets. (2) We define "narrow environmental measures" as improvements to the company's own environmental impact, eg reduction in the company's own carbon emissions.*

### Ensuring output delivery

- 1.6. In this document we set out a comprehensive set of primary outputs that we require GDNs to deliver in return for the revenue allowances. We also set out a number of secondary deliverables that we require GDNs to report to enable us to assess their performance against the primary output, eg a number of secondary deliverables for safety and reliability outputs.
- 1.7. We have started to develop the reporting requirements to enable us to monitor GDNs' output performance over the price control period, and ultimately hold GDNs to account. We explain our approach to both the development of the Regulatory Instructions and Guidelines (RIGs), the principal reporting tool, as well as our approach to ensuring compliance with data requirements, in the parallel RIIO-T1/GD1 draft licence conditions consultation.
- 1.8. The way in which we propose to hold GDNs to account for the outputs depends on the primary output. For example, a number of primary outputs relate to health and safety regulations and are enforced by the Health and Safety Executive, eg in relation to safety outputs. We will ensure compliance with other primary outputs through licence conditions, eg in relation to the emergency response primary output. For other output measures, GDNs are rewarded or penalised in relation to their output performance through a within period incentive mechanism (eg in relation customer services outputs or gas transport losses) or at an end of period review. In this document we set out the relevant incentive mechanisms and how we will undertake the end of period reviews of output performance.



1.9. In appendix 2, we set out the full set of outputs and secondary deliverables and means of monitoring and incentivising GDNs’ performance, and holding them to account.

## Innovation

1.10. The RIIO model has a number of elements to encourage innovation, including the longer price control and outputs framework. The framework also provides funding for network companies to undertake innovation where the commercial benefits are not clear, in the form of the network innovation competition (NIC) and the network innovation allowance (NIA). Table 1.2 summarises our March Strategy Document in relation to NIC and NIA, and the further issues we are consulting on as part of initial proposals.

**Table 1.2: Summary of innovation proposals**

Policy area	March Strategy Document	Further issues for consultation
NIC	Provide time limited innovation fund of up to £20m pa for gas distribution and transmission	We do not expect to be able to introduce NIC until 2014-15 at the earliest due to statutory restrictions. We are consulting on the alternative funding options: <ul style="list-style-type: none"> <li>(i) Run the NIC and raise the required funds from the winning GDNs</li> <li>(ii) Do not run NIC in 2013-14 but roll over funds to 2014-15</li> </ul>
NIA	Provide funding of 0.5-1% of allowed revenues depending on quality and content of companies’ innovation strategies.	Consulting on funding levels of 0.5% funding for Scotia Gas Networks (SGN) and Wales and West Utilities (WWU), and 0.6% for National Grid Gas Distribution (NGGD) and Northern Gas Networks (NGN)

## Structure of document

1.11. The remainder of this document sets out our proposals on the outputs and incentive mechanisms for each output category.

- Chapter 2: Environmental outputs
- Chapter 3: Customer service
- Chapter 4: Social outputs
- Chapter 5: Connections
- Chapter 6: Safety
- Chapter 7: Reliability

1.12. In addition, chapter 8 sets out our proposals for consultation in relation to innovation.

## 2. Environmental outputs

---

### Chapter Summary

The RIIO framework requires companies to reduce their own business carbon footprint (the narrow environmental objective) as well as contribute to meeting GB carbon targets (broader environmental objectives). This chapter sets out our proposed outputs and output levels, and associated incentive mechanisms, for RIIO-GD1.

**Question 1:** *Biomethane information provision:* We would welcome respondents' views on whether our proposed information provision draft licence condition meets the needs of potential biomethane/entry connectees.

**Question 2:** EEI/ shrinkage incentive:

(a) Should we introduce option A or option B (or an alternative) in relation to the rolling incentive mechanisms for the EEI?

(b) Should we also adopt a rolling incentive mechanism in relation to the commodity cost element of gas transport losses, ie in addition to the EEI?

**Question 3:** Do you have any comments on our proposed shrinkage and losses output levels?

### Introduction

- 2.1. The RIIO framework identifies two environmental objectives: to ensure that companies contribute to the wider environmental objectives, eg by maximising the volume of low-carbon flows on the network and promoting energy efficiency ('broad environmental measure'), as well as minimise the environmental impact of their own activities ('narrow environmental measure').
- 2.2. In relation to environmental outputs, in our March 2011 Strategy Document we set out that we would do the following:
  - i. In relation to the broad environmental measure:
    - publish companies' performance in relation to connecting low carbon generators, to provide reputational incentives to improve performance (relating to broad environmental measure)
    - continue with a discretionary reward scheme (DRS) that rewards companies that deliver outputs that contribute to environmental and social objectives beyond those funded at the price review
  - ii. In addition, we proposed specific measures to facilitate the connection of biomethane, the introduction of connection standards for biomethane producers, and the timely provision of information in relation to connection.

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

- iii. In relation to companies' own environmental emissions, we proposed to continue with a (modified version of) the shrinkage allowance and environmental emissions incentive (EEI); mechanisms which provide enhanced incentives to reduce network losses.
  - iv. We also proposed to publish companies' performance in relation to their business carbon footprint and other natural resource emissions, to provide a benchmark, and a reputational incentive to improve performance.
- 2.3. In relation to the above points, we set out below further progress we have made since our March Strategy Document. For a number of areas, we also set out more detail in relation to the output definition, level and/or associated incentive mechanism for consultation, eg in relation to the EEI rolling incentive mechanism.

### Broad environmental measure

- 2.4. In terms of the broader environmental objective, the intention is to create an enabling regulatory environment to ensure that companies play their role in delivering a low carbon energy sector. For the GDNs the most obvious role involves facilitating the connection of renewable gas (ie biomethane<sup>1</sup>) plant.

### March Strategy Document

- 2.5. In our Strategy Document, we stated that we would publish companies' performance for the following measures: (i) the total capacity (MW) of biomethane connected; and (ii) the total capacity (MW) of biomethane enquiries and applications currently in progress but not yet connected.
- 2.6. As set out in our March Strategy Document, we acknowledged that the capacity of biomethane connected to a GDN's network is (to a large extent) outside of companies' control. For this reason, we did not intend to attach a financial reward/penalty but instead to publish an assessment of GDNs' performance, ie to provide a reputational incentive.
- 2.7. In our March Strategy Document<sup>2</sup> we also set out our intention to revise the DRS established under the current price control (GDPCR1). The DRS rewards

---

<sup>1</sup> Biogas is a renewable source of gas produced from the breakdown of organic matter and is produced by a process of anaerobic digestion. Biogas has a variety of applications, but it is predominately used to generate electricity in the UK. To inject the gas into the grid it must first be converted to biomethane by removing the oxygen. Distributed gas refers to non-renewable sources of gas (such as shale gas), as well as renewable sources (ie biomethane).

<sup>2</sup> Decision on strategy for the next distribution price control – RIIO-GD1 outputs and incentives.

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=312&refer=Networks/GasDistr/>

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

network companies that can demonstrate that they have delivered additional outputs to contribute to environmental (or social) objectives beyond those funded at the price review. The revised DRS acknowledges that the stakeholder engagement element of the broad measure of customer service would provide a material incentive for GDNs to engage strategically on a range of different issues that could include some rewarded by the current DRS; however, we consider that we should retain the DRS with its specific focus on environmental and social outputs.

- 2.8. We proposed to issue an award, following the assessment of an independent Panel chaired by Ofgem, in three tranches of £4million (in years three, six and nine following the start of RIIO-GD1).<sup>3</sup>

### GDNs' plans

- 2.9. In relation to the broad measure (ie capacity of biomethane connected), all companies agreed with our proposed output measures. A number of GDNs provided indicative forecasts of the expected volume of biomethane connections over the price control period.
- 2.10. SGN also proposed a positive financial reward in relation to biomethane (or distributed gas) connections and low carbon flows. Specifically, SGN proposed: (i) a one off payment of £100,000 for each connection "to cover one off payment of £100,000 for each connection"; and, (ii) a payment of 0.25p/kWh for each kWh of green gas delivered onto the network from embedded renewable sources.
- 2.11. In relation to the DRS, most GDNs supported our approach set out in our March Strategy Document. However, SGN considered the scheme should be expanded to cover specific social objectives (priority services register, companies' social obligations and business carbon footprint) as requested by their stakeholders and suggested a financial incentive of £36 million for the review period as opposed to our decision in the March Strategy Document of £12 million.

### Our proposals

- 2.12. We do not agree with SGN's proposal to introduce a financial reward only for the capacity of biomethane connections and carbon flows. Under our proposed framework, GDNs have an obligation to connect in a timely way under the proposed connection standards (see below). The stakeholder engagement

---

#### [RIIO-GD1/ConRes](#)

<sup>3</sup> The third and final review will take place in the first year of RIIO-GD2, and will assess GDNs' performance in relation to the last two years of RIIO-GD1.

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

element will also provide incentives for GDNs to engage with prospective connectees. We would also like to ensure the regulatory framework does not bias a particular technology above others, a point supported by respondents to our December 2010 strategy consultation and our consultation on GDNs' second business plans.<sup>4</sup>

- 2.13. Thus, we reaffirm our intention to publish companies' comparative performance in relation to biomethane connections but we will not introduce a financial incentive to connect.
- 2.14. In relation to the DRS, we believe there are clear benefits to the DRS scheme as a vehicle to encourage network companies to play a significant role in delivering environmental and social outputs. We consider this scheme as complementary to the stakeholder engagement component of the broad measure of customer service. We would expect the delivery of environmental and social objectives (as incentivised through the DRS) to be underpinned by a coherent stakeholder engagement strategy.
- 2.15. We do not accept SGN's proposed changes to the DRS, and the increase in the total reward. In the main, we consider that the activities that SGN has set out should be funded through our core cost allowances (ie as these relate to activities GDNs currently undertake, and thus are reflected within base year costs) or could potentially fall within the scope of the stakeholder engagement reward.
- 2.16. We acknowledge that we need to provide greater clarity in relation to how the scheme will operate. We will set out the criteria and governance process for the DRS in a guidance document which will be issued prior to the implementation of the scheme during the price review.

### Information provision and connection charging for distributed gas

- 2.17. In our Strategy Document, we stated that we would develop information provision for distributed gas, and we would introduce a licence condition setting out the requirements. Since our Strategy Document, we have discussed the information provision requirements with the industry (namely, the Energy Market Issues for Biomethane, or EMIB, working group), and we have developed a draft licence condition setting out the proposed obligations on GDNs in this area. We are consulting on the licence condition as part of parallel licence condition consultation.

---

<sup>4</sup> See: EdF (June 2012) *RIIO-GD1: Gas Distribution Networks' (GDNs) second business plans – publication and next steps* <http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/EDF%20response%20to%20GDN%20Business%20Plan%20%207112.pdf>

## **RIIO-GD1: Supporting document – Outputs, incentives and innovation**

- 2.18. We would welcome respondents' views on the policy content (as opposed to legal drafting issues) of the proposed draft licence condition as part of this consultation. (See RIIO-T1/GD1 Draft licence conditions.)
- 2.19. In relation to the connection charging boundary, in our strategy we stated that GDNs should review their charging methodology for entry customers, and propose modifications if there is an objective rationale for doing so. Since then, NGGD has proposed Uniform Network Code (UNC) modification 391 which is currently subject to consultation.<sup>5</sup> We note that this modification does not propose changes to the connection charging boundary; rather the modification proposes changes to the transportation charge incurred by entry connectees.
- 2.20. As set out in March Strategy Document, we have introduced an uncertainty mechanism to accommodate any change to the boundary where the GDN incurs costs as a result of the change.<sup>6</sup>

### **Shrinkage**

- 2.21. Shrinkage refers to gas which is lost from the transportation network. It is the dominant element of companies' business carbon footprint and accounts for more than 0.75 per cent of GB greenhouse gas emissions. Shrinkage comprises leakage from pipelines (around 95 per cent of gas losses), theft from the GDN network (c. three per cent), and own-use gas (c. two per cent). A common leakage model is used by the GDNs to assess the leakage from each of their networks. Under the Unified Network Code (UNC), GDNs are responsible for purchasing gas to replace the gas lost through shrinkage, and we fund companies to purchase reasonable levels of gas shrinkage in setting price limits.<sup>7</sup>

### **Strategy Document**

- 2.22. In our Strategy Document, we outlined our intention to maintain the broad structure of the shrinkage allowance and the EEI. The main change proposed was the introduction of a rolling incentive mechanism for the EEI to address the disincentive to invest in carbon abatement towards the end of the price control (referred to as the periodicity problem). In addition we proposed to introduce new reporting requirements to ensure that companies use smart

---

<sup>5</sup> See: <http://www.gasgovernance.co.uk/0391/>

<sup>6</sup> See: [http://www.gasgovernance.co.uk/sites/default/files/Draft%20Modification%20Report%200391%20v1.0\\_0.pdf](http://www.gasgovernance.co.uk/sites/default/files/Draft%20Modification%20Report%200391%20v1.0_0.pdf)

<sup>7</sup> For sources, see: Ofgem (December 2011): Consultation on strategy for the next gas distribution price control - RIIO-GD1 Outputs and incentives, p.14. Link: <http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/GD1%20outputs%20and%20incent.pdf>

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

metering data to test the validity of the leakage model used to assess and report on shrinkage and leakage performance.

- 2.23. Since March we have set out in detail to the RIIO-GD1 Environmental Working Group how we expect the rolling incentive mechanism to work, and we have discussed our proposals with the Environmental Working Group (EWG).
- 2.24. In this section, we set out our proposed shrinkage volumes (or baselines), and two options for the rolling incentive mechanism.

### Our proposals: shrinkage volumes

- 2.25. Appendix 7 sets out in detail the basis for our proposed shrinkage targets (or baselines against which GDNs will receive a reward or penalty). As we describe in the appendix, we have adjusted GDNs' proposed reductions in shrinkage where we consider that they are inconsistent with the proposed iron mains replacement programme. However, we have also adjusted proposed shrinkage baselines to take into account our modifications to GDNs' main replacement plans. Overall, we expect a reduction in shrinkage of the order of 15-20 per cent over the RIIO-GD1 period.

**Table 2.1: Proposed shrinkage volumes (GWh)**

GDN	Shrinkage volume:		Reduction (%)
	2012/13	2020/21	
NGGD - EoE	559	470	-16%
NGGD - Lon	297	241	-19%
NGGD - NW	431	351	-19%
NGGD - WM	334	280	-16%
NGN	471	388	-18%
SGN - Scotland	254	216	-15%
SGN - Southern	653	544	-17%
WWU	448	389	-13%

### Our proposals: shrinkage incentive mechanism

- 2.26. We propose a rolling incentive mechanism to ensure that there is consistent incentive on companies to reduce leakage in each year of the price control. To do this, we propose that companies are allowed to retain the benefits of outperformance (or the costs of underperformance) for eight years, irrespective of when in the price control period, the outperformance or underperformance is realised.

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

- 2.27. One licensee has also proposed: (i) to extend the rolling incentive mechanism to cover the shrinkage allowance (as well as the EEI); and (ii) a variation on our proposed rolling incentive mechanism which would have the effect of bringing forward the timing of the reward (or penalty) payments to GDNs.
- 2.28. We describe the two options A and B for the EEI rolling incentive mechanism in Appendix 3. We also set out the detailed algebra for the two options as part of the parallel licence consultation. The two options are identical in terms of outcomes and the differences relate to when the reward (or penalty) payment occurs, and the corresponding impact (or volatility) in customers' bills. We would welcome respondents views in respect of the following:
- Should we introduce option A or option B in relation to the rolling incentive mechanisms for the EEI? (Or an alternative?)
  - Should we also adopt a rolling incentive mechanism for the shrinkage allowance, ie to the commodity element of any under or over-performance against the assessed shrinkage baseline?
- 2.29. We set out the pros and cons of options A and B in appendix 3. In relation to the second question, we support the extension of the roller to the shrinkage allowance. It is conceptually consistent to apply the same incentive mechanism to both the EEI mechanism (which provides incentives in relation to the carbon price element of transport gas losses) and the shrinkage allowance (which provides incentives in relation to the commodity price element of the gas lost to shrinkage).

### Business Carbon Footprint (BCF) excluding shrinkage

- 2.30. In our Strategy Document, we set out our intention to require GDNs to report annually on their carbon dioxide (CO<sub>2</sub>) equivalent emissions, using a standard framework for reporting BCF which we will develop with the industry. We decided not to introduce a financial reward/penalty to avoid duplicating existing government fiscal policy which incentivises reductions in companies' BCF.
- 2.31. In their second plans, the GDNs set out proposals to reduce their BCF. For example, NGGD has stated that it will reduce its BCF emissions by 20 per cent over the price control. The other GDNs also set out proposed reductions.
- 2.32. We have not proposed to fund any specific schemes to reduce BCF. However, we expect GDNs to continue to reduce their BCF through base cost allowances, as set out in their plans. We will finalise the reporting framework in the RIGs which we will publish along with our final proposals.



## **Other emissions and natural resource use**

- 2.33. In our Strategy Document, we required GDNs to set out in their business plans, a forecast for the expected number of land remediation sites, distinguishing between statutory and non-statutory remediation. We required GDNs to submit the expected volumes of aggregate extraction and spoil to landfill as part of their business plans. We also stated that we would require GDNs to report annually for these measures, and we would publish their performance levels, ie to provide reputational incentives to improve performance.
- 2.34. We also require GDNs to report annually on the number of non-conformities identified in their annual environmental reporting (reported through the ISO 14001 independent audit process).
- 2.35. In their plans, all GDNs set out their forecasts in relation to the above measures. No GDN requested land remediation beyond statutory levels. We set out the expected sites remediated to statutory levels (and our proposed allowance) as part of our assessment of gas holder decommissioning costs (see chapter 7).
- 2.36. We will set out the detailed reporting requirements in relation to other emission (ie non carbon) and resource use as part of the RIGs.

## 3. Customer service

---

### Chapter Summary

In our Strategy Document, we set out our intention to introduce a financial reward/penalty in relation to GDNs' customer satisfaction. We are now consulting on the details of the proposed mechanism.

### Questions:

**Question 1:** We would welcome views on our proposed approach to the broad measure, namely:

(a) *Customer survey:* Our proposed weightings for different customer interactions, and scores associated with maximum penalty, target and maximum reward (see table 3.3).

(b) *Complaints metric:* Our proposed weightings for each complaint element (incl. whether or not to include Energy Ombudsman findings within the metric), and score associated with target and maximum penalty (See table 3.4).

(c) Overall revenue weightings: we welcome views on one GDN's proposed changes to the weightings of the different elements of the broad measure revenue (see table 3.5)

### Introduction

- 3.1. This section briefly describes the proposed customer service output measures and incentive mechanism set out in our Strategy Document, and the work we have undertaken since then to develop the proposed mechanism.
- 3.2. In our March 2011 Strategy Document we proposed an overall financial incentive rate of +/- one % of company revenues across three components of the broad measure of customer service incentive:
  - (i) a customer satisfaction survey (-0.5% to +0.5%)
  - (ii) a complaints metric (0 to -0.5%)
  - (iii) stakeholder engagement (0 to +0.5%).
- 3.3. We stated that we would set the target levels for the customer satisfaction survey and complaints metric for the whole of the RIIO-GD1 period based upon industry performance in 2011-12. We adopted this approach in response to GDNs' suggestions that a fixed target would provide a stronger incentive to improve performance. We also stated that performance above and below this target level would result in rewards or penalties, with the size of penalty or reward being calculated on a sliding scale basis up to a maximum level.
- 3.4. Working with the industry we have developed the proposed customer survey and complaints metric in order to set the incentive mechanism for RIIO-GD1. We have collected data for the customer satisfaction survey and the complaints metric for the period 1 October 2011 to 31 March 2012. We have

## **RIIO-GD1: Supporting document – Outputs, incentives and innovation**

used these data sets (almost 14,000 customers' views) to inform the target levels of performance for RIIO-GD1.

- 3.5. In relation to stakeholder engagement, we propose to hold a trial of our approach in summer 2013 drawing on the parallel mechanism developed with the electricity distribution networks (DNOs) for the current distribution price control (DPCR5).
- 3.6. We discuss our proposals in relation to the three elements of the broad measure below.

### **Customer satisfaction survey**

- 3.7. The survey involves interviews with three types of customer based on the interaction that they had with the network: (i) connections; (ii) unplanned interruptions; and (iii) planned interruptions.
- 3.8. The survey will ask customers in each of the above categories to rate the overall service using a ten point scale (where 10 is excellent), and we will then use those scores to calculate an average score. In our March Strategy Document we set out that the reward or penalty associated with the survey would be +/- 0.5% allowed revenue for each GDN. The size of the reward or penalty would be determined by the performance of the GDN relative to a target score. This target score would be set at the upper quartile level of performance during a trial of the survey in 2011-12.
- 3.9. We need to determine the following three elements of the customer survey:
  - the weighting applied to each customer category
  - the level of maximum penalty/reward
  - the incentive rate applied to GDNs' scores.
- 3.10. Table 3.1 sets out the results from the trials (see also Appendix 4). In all three components of the customer satisfaction survey, the range between the best and the worst GDN scores was relatively narrow. The trial also resulted in a higher upper quartile score for the unplanned interruption component of the customer satisfaction survey, than the other two components.

**Table 3.1: Customer satisfaction survey trial - average scores across GDNs**

Element	Mean score	Upper quartile	Max score	Min score
Connection	7.81	8.04	8.32	7.46
Unplanned interruption	8.68	8.81	8.92	8.30
Planned interruption	7.93	8.09	8.49	7.47

### GDNs' proposals

3.11. The GDNs proposed:

- Equal weightings should be applied to the three elements of the customer satisfaction survey with separate targets for each.
- Setting the score at which the maximum reward would be realised, closer to the target score than the corresponding maximum penalty score. The GDNs consider that this approach is justified as the target score will be set at a reasonably high level for each element (ie upper quartile performance for 2011-12).
- Setting the maximum reward/penalty based on fixed scores.

3.12. Table 3.2 sets out the GDNs' proposals (see also Appendix 4 for the potential impact of these proposals on GDNs' revenues).

**Table 3.2: GDNs' proposed weighting and scores associated with maximum penalty and maximum reward**

Element	Weight	Max penalty	Target score	Max reward
Connection	33.33%	7.4	8.04	8.4
Unplanned interruption	33.33%	8.0	8.81	9.0
Planned interruption	33.33%	7.5	8.09	8.5

### Our proposals

3.13. In line with the GDNs' proposal, we propose to apply equal weightings to each of the three elements of the survey. We have not received any evidence to suggest that any element should be weighted differently to the others. We also propose to set different targets for each element of the survey reflecting the variation in customers' views of current performance. This recognises that customer expectations may differ by service and results in a higher target score for the unplanned interruption component survey than the other two components. Although we propose to set different targets for each element, in all instances this will be at a level above 8 out of 10.

3.14. We also propose to set the maximum levels of reward or penalty using an asymmetric approach. This reflects the relatively high level of performance

that is represented by the target scores. We believe that the maximum penalty should only be realised where performance falls some way below this level and we should not unduly penalise companies that in actuality are performing well. However, to apply the same scaling for the maximum level of reward may result in companies having to achieve an average score for customer satisfaction that is close to 10 (out of 10); we do not consider this level of performance is attainable. This is a particular concern in the case of unplanned interruptions.

- 3.15. We have considered a number of different approaches to setting the scores at which the maximum levels of penalty or reward will be realised. Our proposed approach is broadly based upon a range of around 1.5 – 1.75 standard deviations around the target score. For the purpose of simplicity and transparency however we propose to use rounded numbers that fall within this range. Our proposal requires GDNs to perform better than the current upper quartile level of performance in order to earn a positive reward. If GDNs do not improve on current service levels, our proposals would lead to an overall annual penalty of around £2.4m (based on 2011-12 trial data).
- 3.16. Table 3.3 summarises our proposals in terms of scores at and below which the maximum penalty applies, the target score where no reward / penalty would be earned and the score at and above which the maximum reward would apply.

**Table 3.3: Our proposed weightings and scores associated with maximum penalty, target, and maximum reward**

Element	Weight	Max penalty	Target score	Max reward
Connection	33.33%	7.5	8.04	8.5
Unplanned interruption	33.33%	8.0	8.81	9.0
Planned interruption	33.33%	7.5	8.09	8.5

- 3.17. We propose to determine the incentive rate for each element by dividing total revenue exposure by the difference between the maximum penalty score or the maximum reward score (whichever is relevant), and the industry target.
- 3.18. We welcome your views on these proposals. We provide more detail and illustrate the financial impact of these proposals in tables A4.2 and A4.3 to Appendix 4.

### Complaints metric

- 3.19. In our Strategy Document we set out that the maximum penalty associated with the complaints metric would be - 0.5% pa of allowed annual revenues. There would also be a dead band associated with the metric, such that no penalty would be incurred where a GDN achieves a score better than the target level of performance. In this case the higher the score the worse the

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

level of performance. The target score will be set equivalent to the upper quartile of performance in 2011-12. We set out that a composite score will be calculated as the sum of each GDN's performance against each element. The metric is split between:

- percentage of complaints unresolved after one working day (1WD) of receipt
- percentage of complaints unresolved after 31 working days (31WD) of receipt
- percentage of repeat complaints
- percentage of Energy Ombudsman findings against the GDN.

3.20. As part of this consultation, we are consulting on:

- the weighting applied to each of the elements
- the maximum penalty score
- the incentive rate applied to GDN scores.

### GDNs' proposals

3.21. The GDNs have considered the weightings applied to the four elements of the complaints metric. As only a relatively small number of complaints involving GDNs are referred to the Energy Ombudsman, the GDNs propose either removing the Energy Ombudsman element from complaints metric or setting the weighting for this element at 5% (with an increase in the weighting applied to 'complaints unresolved after 31 working days').

3.22. GDNs have proposed that the maximum penalty be calculated based on 1.75 standard deviations from the mean performance during 2011-12, as opposed to the upper quartile level of performance. They argue that the financial impact attached needs to be proportionate to the loss in customer benefits and that using the upper quartile to set the target score already provides a high starting point for the incentive.

3.23. By applying the GDNs' proposals to the trial data, the target score would be 13.37<sup>8</sup> and the maximum penalty score would be 27.72<sup>9</sup>.

---

<sup>8</sup> Based on the GDN's proposals, there are a number of ways in which a score of 13.37 could be achieved. For illustration, a score of 13.37 would equate approximately to a company that has 75% of complaints outstanding after one day, 13% of complaints outstanding after 31 days, 1% repeat complaints and 17% of Energy Ombudsman findings against in favour of the complainant.

<sup>9</sup> Based on the GDN's proposals, there are a number of ways in which a score of 27.75 could be achieved. For illustration, a score of 27.72 would equate approximately to a company that

- 3.24. In addition the GDNs propose to exclude findings against them by the Energy Ombudsman under certain conditions.<sup>10</sup> If we were to include the proposed exemptions this would alter the results of the six month trial and would subsequently change the target score.

### Our proposals

- 3.25. We consider that the percentage of Energy Ombudsman findings against the GDN is a meaningful indicator of a GDN's overall approach to managing complaints. We therefore propose to include this element as a component of the complaint metric. We are not minded to introduce exemptions to Energy Ombudsman findings against the GDN. Throughout their internal complaint handling process the GDN will have had an extensive period of time in which to consider the merits of the case. Even once the dispute has been referred to the Energy Ombudsman, the GDN still has opportunities to assess and, if necessary, change their position prior to the Energy Ombudsman's final decision. We welcome views on this approach.
- 3.26. In determining the weightings for each element of the complaints metric, we have taken into account the weightings used in the equivalent metric set for DPCR5. For GD1 we propose to reduce the weighting for the Energy Ombudsman to 10%. This weighting reflects the importance we attach to this aspect of the dispute resolution process but takes account of the risk that GDNs might place an undue emphasis on settling a small number of disputes to avoid the risk of the Energy Ombudsman finding against them. This reduction in weighting for the Energy Ombudsman element is offset by a higher weighting attached to the number of complaints outstanding after 31 working days.
- 3.27. By applying our weightings to data gathered in 2011-12, the target complaints metric score for the RIIO-GD1 period would be **16.57**. We propose to apply a

---

has 80% of complaints outstanding after one day, 30% of complaints outstanding after 31 days, 14% repeat complaints and 45% of Energy Ombudsman findings against in favour of the complainant.

<sup>10</sup> Specifically, the GDNs propose to exclude Energy Ombudsman findings against them where: (i) The Energy Ombudsman decision requires no change of policy or charging methodology; (ii) no guaranteed standards of performance payments have been missed by the GDN; (iii) the Energy Ombudsman final decision is not materially different to the GDN solution or goodwill payment offered. Examples of goodwill payments are where customers are awarded money to cover the inconvenience associated with the Energy Ombudsman complaint. An example of an exempt decision would be a delay in the reinstatement of a patio following replacement work. A new patio was laid by the GDN and £30 was offered as a goodwill pay, however customer wanted £2,500. The Ombudsman's final decision was that the GDN should pay an additional £20 goodwill payment.

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

dead band such that a GDN that achieves a score better (ie below) than this target will not face any penalty.<sup>11</sup>

- 3.28. We agree with the GDNs' proposal to calculate the maximum penalty score based on 1.75 standard deviations from the mean level of performance in 2011-12. We believe that this approach ensures that the size of the penalty better corresponds with the level of performance. By applying our proposed weightings to the 2011-12 data, this will result in the full penalty being applied to any network achieving a score of **30.25** or above.<sup>12</sup>
- 3.29. Our proposed weighting for each element of the metric is set out in the table below:

**Table 3.4: Our proposed weightings, score associated with target and maximum penalty for customer complaints element of broad measure**

Element	Ofgem proposed GD1 weightings
Complaints 1WD	10%
Complaints 31WD	30%
Repeat complaints	50%
Ombudsman findings	10%
<b>Target score</b>	<b>16.57</b>
Standard Deviation	5.74
Mean	20.21
Maximum penalty score	30.25

- 3.30. We propose to determine the incentive rate by dividing total revenue exposure by the difference between the maximum penalty score and the industry target.
- 3.31. We welcome respondents' views on these proposals. We provide more detail and illustrate the financial impact of these proposals in table A4.4 in Appendix 4.

---

<sup>11</sup> Based on our proposals, there are numerous ways in which a score of 16.57 could be achieved. For illustration a score of 16.57 could equate approximately to a company that has 75% of complaints outstanding after 1 day, 17% of complaints outstanding after 30 days, 3% repeat complaints and 25% of Energy Ombudsman findings against the network.

<sup>12</sup> Based on our proposals, there are a number of ways in which a score of 30.25 could be achieved. For illustration a score of 30.25 could equate approximately to a company that has 88% of complaints outstanding after 1 day, 30% of complaints outstanding after 30 days, 15% repeat complaints and 50% of Energy Ombudsman findings against the network.



## **Stakeholder engagement**

3.32. In our Strategy Document we proposed a financial incentive for performance in this area up to 0.5 per cent pa of annual allowed revenues.

### **GDN proposals**

3.33. GDNs expressed concern about the discretionary basis for this reward and whether it could be more objective or, alternatively, whether we should reduce the overall reward (offset by an increase in the reward for the customer survey).

### **Our proposals**

3.34. We propose to set financial incentive for performance in this area up to 0.5 per cent pa of annual allowed revenues

3.35. In discussion with the GDNs and building upon the equivalent work we are undertaking with the DNOs, we have developed an assessment process for this scheme. This should provide greater clarity over how we and the new independent panel will assess GDNs' stakeholder engagement activities.

3.36. Our proposed approach will involve us assessing GDNs' submissions against the minimum requirements. We have developed these requirements in conjunction with GDNs and mirror the requirements on DNOs:

- The GDN has a comprehensive and up to date stakeholder engagement strategy, which sets out how it keeps stakeholders informed about relevant issues, business activities, decision-making and other developments, and how the GDN enables timely input and feedback from stakeholders via appropriate mechanisms to inform decision making.
- The GDN has engaged with a broad and inclusive range of stakeholders and has used a variety of appropriate mechanisms to inform and engage their stakeholders – and that these have been tailored to meet the needs of various stakeholder groups and are fit for purpose in allowing a detailed analysis of a breadth of stakeholder perspectives.
- The GDN can demonstrate it is acting on input/feedback from stakeholders.

3.37. Those GDNs who meet minimum requirements will then be invited to attend a session with an independent panel of experts. The panel will assign a score that then determines the financial reward awarded to each network.

3.38. In assessing the GDNs' performance, the panel will focus on the outcomes achieved rather than the engagement process itself.

3.39. Stakeholder engagement activities are assessed the summer after the year in question. For example, the 2013-14 financial year will be assessed in summer 2014 and any reward associated with this financial year recovered in 2015-16.

**Revenue associated with customer service output measures and incentive mechanism**

3.40. GDNs have proposed a reward/penalty of +1.5 /-1% of allowed revenues in contrast to +1/-1% set out in our Strategy Document. We do not consider that the GDNs have provided any further evidence for us to revisit the decision made in our March Strategy Document. Thus, we do not propose to change the overall scale of reward/penalty for the broad measure of customer service.

3.41. One GDN (NGN) has suggested that there is scope to change the balance of revenues between different elements of the incentive as follows:

**Table 3.5: Weightings associated with different elements of the broad measure**

Incentive	Ofgem proposal	NGN proposal
Customer satisfaction survey	+0.5 to -0.5%	+0.8 to -0.5%
Complaints metric	0 to -0.5%	0 to -0.5%
Stakeholder engagement	0 to +0.5%	0 to +0.2%

3.42. NGN considers that an increased upside on the customer satisfaction survey to 0.8% will encourage companies to consider improvements in all aspects of customer service. NGN believes that this will ensure GDNs are offering an appropriate level of service. The other GDNs do not agree and believe the proposed incentive for stakeholder engagement provides companies with a level of reward which supports appropriate investment in innovation and improvement to the benefit of customers and wider stakeholders.

3.43. We would welcome respondents’ views on NGN’s proposals. (table A4.5 in Appendix 4 sets out the impact of these proposals on the GDNs revenues).

## 4. Social outputs

---

In our Strategy Document, we set out our intention to continue with fuel poor network extensions scheme. We are now consulting on the proposed level of connections, and our proposed carbon monoxide (CO) output measure.

**Questions:**

**Question 1:** We would welcome your views on the proposed number of fuel poor connections (see Table 4.1).

**Question 2:** We would welcome your views on our proposed approach to CO issues including setting an output measure based on improving CO awareness.

### Fuel poor network extension scheme

#### March Strategy Document

- 4.1. In our March 2011 Strategy Document we set out our proposals to continue with the fuel poor network extensions scheme with funding approved on an ex ante basis. We will conduct a review in conjunction with affected stakeholders during RIIO-ED1 to assess whether the scheme is justified in context of DECC's heat strategy. This is likely to be from 2014. We will require GDNs to collect relevant data (eg cost data) to inform the review and we will set out the data requirements in the RIGs.
- 4.2. We set out that we expected GDNs to identify in their business plans the expected output for the scheme, eg in terms of fuel poor households connected, and their estimate of the costs of delivering this output. We expect this approach would provide strong incentives for GDNs to minimise connection costs (subject to realising the output level).
- 4.3. We also noted the role for the Discretionary Reward Scheme (DRS) to provide a financial incentive to GDNs to facilitate the development of non-network solutions to the fuel poor, eg by rewarding GDNs for working with other players in the sector (electricity distributors, suppliers, technology providers), to facilitate sustainable energy solutions to the fuel poor.

#### GDNs' proposals

- 4.4. The GDNs' first business plan submissions set out their rationale for achieving their forecast fuel poor network connections. We challenged them to provide more robust evidence to support their proposals. In their second plans the industry as a whole, and SGN in particular, provided greater evidence to support the proposed number of connections and associated costs.
- 4.5. The GDNs acknowledged that there were constraints to increasing the number of connections related to the economic test (where customers have to make

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

an upfront payment where the connection cost exceeds the present value of future connections), and third party provision of funding for in-house system costs.

### Our proposals

- 4.6. We propose to fund the GDNs' proposals to connect around 75,000 households in total over RIIO-GD1 (set out in Table 4.1 below<sup>13</sup>). GDNs will be held to account for realising the number of fuel poor over the period, and we will adjust GDNs allowances at the end of RIIO-GD1 for any failure to deliver the prescribed output. We set out the allowed costs in relation to the output delivery in the cost efficiency supplementary annex.
- 4.7. We would welcome respondents' views on the proposed output level, and in particular, evidence from GDNs/ other parties in relation to the potential to connect greater numbers of fuel poor (within the constraints of the current scheme).
- 4.8. As set above, we also intend to undertake a review of the scheme during RIIO-ED1 and we have drafted a relevant licence condition included in our parallel licence consultation.

**Table 4.1 – Number of forecast fuel poor network extensions by GDN**

Company	Licensee	Total
NGGD	East of England	10,080
	London	2,880
	North West	13,330
	West Midland	8,360
NGN		12,000
SGN	Scotland	11,000
	Southern	6,400
WWU		10,800
<b>Total</b>		<b>74,850</b>

- 4.9. We also need to ensure that GDNs work with other stakeholders to identify the least cost solution for fuel poor households. As set out in chapter 2, the DRS will provide a reward mechanism for GDNs to work with other parties to develop an integrated approach to address fuel poverty.
- 4.10. Additionally, our recent consultation on our future strategy for vulnerable customers<sup>14</sup> considered the need for a greater degree of cross-industry and

<sup>13</sup> Table A4.6 in appendix 4 lists the annual forecasts for fuel poor network extensions

<sup>14</sup> [http://www.ofgem.gov.uk/Sustainability/SocAction/Documents1/Energy%20Affordability\\_helping%20develop%20Ofgem's%20Vulnerable%20Consumers'%20Strategy.p](http://www.ofgem.gov.uk/Sustainability/SocAction/Documents1/Energy%20Affordability_helping%20develop%20Ofgem's%20Vulnerable%20Consumers'%20Strategy.p)

wider working to develop solutions to help address issues beyond gas network extensions. As part of this, the next electricity price control (RIIO-ED1) and in preparation for the gas network extensions review, we intend to convene an industry forum (comprising GDNs, electricity distribution network operators, suppliers, representatives from the non-profit sector), with the aim of facilitating the delivery of a joined-up approach to identifying solutions for those not on the gas grid.

### **Carbon monoxide awareness**

#### **March Strategy Document**

4.11. In our Strategy Document we set out our expectation that GDNs should progress with trials of activities addressing risks associated with CO poisoning. We stated that we would consider the results of the trials and set out proposed outputs in relation to CO following their completion.

#### **GDNs' proposals**

4.12. The GDNs have set out in their business plans, proposed activities (and output measures) in relation to CO based on their trials. Although GDNs have proposed a number of different activities, generally they each have the common objective of improving awareness of the risks associated with CO amongst the public, and providing education on the steps that can be taken in response.

4.13. SGN has also proposed a financial incentive in relation to CO awareness of up to 0.5% pa of total revenues based. SGN propose an annual survey of awareness to measure delivery of this output.

#### **Our proposals**

4.14. We are pleased to note that all of the GDNs are implementing measures that will improve their ability to measure levels of CO in air on site. These approaches accord with recommendation 8 from the All Party Parliamentary Gas Safety Group report on preventing carbon monoxide poisoning.<sup>15</sup>

4.15. We welcome the diverse range of other activities that GDNs propose to address the risk of CO poisoning which have been tailored to their specific stakeholders' needs. Consistent with an outputs based approach we do not intend to prescribe the specific approach.

---


15

[http://www.policyconnect.org.uk/appgsg/sites/default/files/Preventing%20Carbon%20Monoxide%20Poisoning%20\(colour\).pdf](http://www.policyconnect.org.uk/appgsg/sites/default/files/Preventing%20Carbon%20Monoxide%20Poisoning%20(colour).pdf)

- 4.16. However, we propose to set a common output measure. In particular, we propose to require GDNs to measure improvements in CO awareness and we will work with the industry to develop a common methodology/survey to measure awareness.
- 4.17. We do not propose to introduce a financial reward/penalty in relation to the proposed output measure (as SGN propose). In relation to the proposed incentive mechanisms, and more generally, we need to ensure that we introduce incentive mechanisms where they deliver clear benefits to the consumer. In particular, we require:
- a robust output measure, eg measurable, controllable, comparable, auditable, and
  - a clear basis for setting the marginal incentive rate (preferably based on the value consumers place on a marginal increment/decrement), to ensure that companies deliver marginal improvement in outputs that are valued by consumers.
- 4.18. In relation to the proposed incentive mechanism, we do not consider this meets either criterion: we lack both a robust output measure which is attributable to GDNs' activities (a number of other parties play critical roles in improving awareness), as well as a basis for setting the marginal reward/penalty. However, we will publish the GDNs' relative performance to provide a reputational incentive.
- 4.19. We would like to encourage GDNs to share the results of their respective activities to understand their effectiveness and enable the adoption of best practice. We propose to use the DRS as a mechanism to reward the dissemination of the effectiveness of GDNs' activities (which we will set out in the relevant DRS governance documents).
- 4.20. In terms of funding, we expect GDNs to deliver improved CO awareness through down-time associated with their emergency service personnel. We also propose to fund specific activities relating to CO that might complement efforts to promote CO awareness where requested by GDNs. For example, we are providing funding of £2.26m to enable NGGD to undertake a range of different activities. These include 2.1m home visits to customers to provide information on the risks associated with CO, the distribution of 105,000 CO alarms to vulnerable customer groups and the upgrade of detection equipment carried by emergency staff to incorporate CO functionality.

### Stakeholder engagement

- 4.21. We expect GDNs to play an active role in addressing a number of social issues, including, but not limited to, fuel poverty and helping to address the risks associated with carbon monoxide poisoning. Across a range of issues we therefore expect GDNs to work collaboratively and strategically with different stakeholders to ensure the right solution is implemented by the most



## **RIIO-GD1: Supporting document – Outputs, incentives and innovation**

appropriate agency. We intend to use the stakeholder engagement element of the broad measure of customer service (see chapter 3), to reward those GDNs that demonstrate these behaviours.

## 5. Connections

---

### Chapter Summary

This chapter sets out our proposals in relation to connection standards of performance and, in particular, in relation to standards of performance for entry connections.

### Questions:

There are no specific questions.

### March Strategy Document

- 5.1. In our March 2011 Strategy Document<sup>16</sup> we set out that we did not propose to change existing connection margin arrangements or the existing gas connections standards of performance for RIIO-GD1.
- 5.2. We did, however, set out our expectation that GDNs would commit, in their business plan submissions, to introduce new voluntary standards of service for distributed gas connections. We expected that the new voluntary standards of service would cover the issuing of quotations, the scheduling of works and the completion of works. We also expected that GDNs would commit to: (i) making penalty payments where they fail to meet the new voluntary standards of service for distributed gas connections; (ii) reporting their performance to us; and (iii) publishing their performance on their websites.
- 5.3. We also expected that GDNs would jointly develop the new voluntary standards of service for distributed gas connections so that they could be applied nationally.

### GDNs' views

- 5.4. All of the GDNs' business plans set out commitments either to maintain or to improve upon their current standards of service for gas demand connections. The GDNs set out various commitments related to the introduction of voluntary standards of service for distributed gas connections. We describe their proposals in more detail in appendix 5.

---

<sup>16</sup> Decision on strategy for the next distribution price control – RIIO-GD1 outputs and incentives.

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=312&refer=Networks/GasDistr/RIIO-GD1/ConRes>



## **Our proposals**

- 5.5. We welcome the GDNs' commitments to maintain/improve standards of service for gas demand connections. We also welcome the commitments made by GDNs (notably WWU, SGN and NGN)<sup>17</sup> to introduce voluntary standards for distributed gas connections and the specific proposals put forward by GDNs in terms of connection standards (see appendix 5).
- 5.6. We expect GDNs to work together, in consultation with distributed gas customers, to agree voluntary standards of service for distributed gas connections. We expect arrangements to include:
- voluntary standards of service for the issuing of quotations, the scheduling of works and for the completion of works.
  - penalty payments to be paid where voluntary standards are not met
  - reporting arrangements.
- 5.7. We will take into account the extent to which GDNs have enabled the connection of distributed gas, including efforts to develop voluntary standards, as part of our evaluation of DRS submissions.

---

<sup>17</sup> NGGD has not made any commitment to develop voluntary standards of service for distributed gas connections.

## 6. Safety outputs

---

### Chapter Summary

This chapter summarises the proposed output levels in relation to safety outputs.

#### Questions:

**Question 1:** Do you agree with our proposed approach to assessing non mandatory investment in relation to tier 2 and 3 iron mains, eg based on a 24 year payback period, and consistent with our earlier investment appraisal guidance?

**Question 2:** Do you agree with our proposed outputs levels in relation to risk removed (MPRS), and associated secondary deliverables (see also Appendix 7)?

**Question 3:** Do you agree with our proposals in relation to the other primary safety outputs?

**Question 4:** Do you agree with our proposed approach to measuring performance in relation to safety risk (see Appendix 10)?

### Introduction

- 6.1. In our March 2011 Strategy Document, we set out that the safety outputs would comprise:
  - the level of risk removed by the iron mains risk reduction programme
  - emergency response performance
  - the management of emergency repairs
  - HSE’s approval of GDN’s safety cases under the Gas Safety (Management) regulations (1996) (GS(M)R) and HSE’s review of GDNs’ safety report under the Control of Major Accident Hazards Regulations (1999) (COMAH)
- 6.2. In this section, we first discuss our proposals in relation to the risk removed primary output for iron mains, and associated secondary deliverables. We then discuss our proposal in relation to the other three primary outputs. (See also Appendix 7.)

## **Iron mains safety risk reduction**

### **New HSE iron mains policy**

- 6.3. In June 2011, the HSE confirmed a revised three-tiered approach to iron mains replacement.<sup>18</sup> The HSE three-tier approach is as follows:
- Mains in Tier 1 (defined as pipes of 8 inches or less in diameter): replacement of 20 per cent seed pipe (defined as the pipe with the highest risk score), plus 80 per cent drawn from any part of the remaining tier 1 population selected on the basis of optimal delivery cost and output benefits. The annual workload must be sufficient to meet the specified yearly workload agreed by the HSE for completion of the programme by 2032.
  - Mains in tier 2 (pipes above 8 inches and below 18 inches in diameter): All mains exceeding a defined risk-action threshold must be abandoned, remediated or assessed for continued safe use. Pipes in Tier 2 scoring below the risk-action threshold may still be subject to decommissioning where a cost benefit analysis agreed with Ofgem is justified.
  - Mains in tier 3 (pipes 18 inches or above in diameter): The risks associated with such pipes will be subject to condition management. Tier 3 pipes may still be subject to decommissioning where a cost benefit analysis agreed with Ofgem is justified.
- 6.4. The HSE has stated that where the GDN conforms to the new policy, the GDN will be afforded protection under PSR 13A.
- 6.5. As set out in our Strategy Document,<sup>19</sup> the HSE also proposes to undertake a more fundamental review of the Pipeline Safety (Amendment) Regulations 2003 (PSR) as they relate to iron mains, and the absolute requirement to maintain a pipeline in an efficient state, in efficient working order and in good repair. The HSE has indicated that it will complete its review of the current statutory framework by 2017 to allow for any consequent changes to GDNs' investment plans to be taken into account at the mid-period review of outputs. We set out in the finance and uncertainty supporting annex our proposed approach to addressing the uncertainty about the implications of any change in approach by the HSE for the GDNs.

---

<sup>18</sup> HSE (9 June) Gas Distribution Network – Iron Mains Replacement Programme Key Elements of a Pipeline Safety Regulations 1996 R13A approval, letter to GDNs.

<sup>19</sup> Ofgem (March 2011) Decision on strategy for the next transmission and gas distribution price controls – RIIO-GD1 outputs and incentives, <http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/GD1decisionoutput.pdf>, para 10.47, p. 79

### **GDNs' proposals**

- 6.6. In their business plan submissions, the GDNs set out proposed improvements in safety risk based on length of main abandoned. GDNs' proposals for decommissioning tier 1 mains were based on abandoning all mains by 2032. Plans for tier 2 were based on abandoning all mains above a risk action threshold, and for tier 2 below the risk action threshold and tier 3 were based on cost benefit analysis. The GDNs' proposals are set out in tables 6.2 and 6.2 below.
- 6.7. NGGD also proposed to apply an output incentive in relation to tier 1 non-seed pipe.<sup>20</sup>

### **Our proposals: Mains volumes and risk removed**

- 6.8. We have disallowed some of the workload GDNs proposed for tier 1 iron mains replacement, and the associated safety and environmental outputs (see table 6.1.) There are two principal reasons for our downward adjustments.
- First, we have adopted more conservative assumptions in relation to the expected growth of tier 1 assets.<sup>21</sup> Our growth assumption leads to a lower constant level of replacement over RIIO-GD1 in order to replace all iron mains by 2032, the date by which all tier 1 mains need to be decommissioned.
  - Second, we do not assume that GDNs need to ramp-down their replacement volumes towards the end of the decommissioning period; this change has resulted in a reduction in the required replacement rate for both NGGD and NGN during RIIO-GD1.
- 6.9. Table 6.1 shows the GDN forecast tier 1 workload, together with our calculations for required workrate and associated growth.

---

<sup>20</sup> See: NGGD (April 2009) RIIO-GD1 Business Plan, Annex I.

<sup>21</sup> Specifically, we have applied a consistent level of iron mains population growth based on the population of non-qualifying mains, ie those further than 30m from a building. This accounts for the length of iron mains qualifying for abandonment as a result of the development of new properties within 30m of a previously non-qualifying iron main, and the discovery of non-recorded iron mains. We have assumed the growth in length equal to 3.9 per cent (over the entire eight year period) of the length of iron mains outside the 30m threshold. This is the value used by NGGD. As the length of mains outside the 30m threshold will decrease annually, this calculation has been applied for each year of the RIIO-GD1 period.

**RIIO-GD1: Supporting document – Outputs, incentives and innovation**

**Table 6.1: GDNs proposed tier 1 workload and our proposed volumes**

A	B	C	D	E	F	G
	Normalised Tier 1 requested workload T1 excluding rechargeable diversions	Total tier 1 qualifying mains population at start of RIIO-GD1 (sourced via SQ responses)	Workload over RIIO-GD1 to achieve completion by 2032 (flat workload profile) excluding rechargeable diversions and growth	Growth in qualifying mains population based on 3.9% of non-qualifying iron mains population (calculated annually)	Total allowed workload over RIIO-GD1 to achieve completion by 2032 (flat workload profile) including growth	Workload adjustment
	Normalised business plan submissions values	Supplementary question responses	C/19*8	Calculated from business plan data and SQ responses	D+E	F-B
	(km)	(km)	(km)	(km)	(km)	(km)
EoE	4,895.32	10,491.00	4,417.26	143.10	4,560.37	-334.95
Lon	2,765.42	5,994.00	2,523.79	35.98	2,559.77	-205.65
NW	3,709.32	7,365.00	3,101.05	58.88	3,159.93	-549.39
WM	2,672.68	5,637.00	2,373.47	111.76	2,485.23	-187.45
NGG		29,487.00	12,415.58	349.72	12,765.30	
NGN	4,178.97	8,490.00	3,574.74	96.76	3,671.50	-507.47
Sc	2,058.73	4,125.00	1,736.84	64.33	1,801.17	-257.56
So	5,002.68	11,744.00	4,944.84	191.62	5,136.46	133.79
SGN		15,869.00	6,681.68	255.95	6,937.63	
WWU	3,169.96	6,027.00	2,537.68	99.49	2,637.17	-532.78

## **RIIO-GD1: Supporting document – Outputs, incentives and innovation**

- 6.10. For tier 2 above the risk action threshold, GDNs adopted different approaches for determining appropriate values. WWU has re-worked the tier 2 threshold from the common approach adopted by other GDNs. We have amended WWU's risk thresholds bringing their overall risk action threshold in line with the other GDNs, resulting in a workload reduction of around 20 km and 4700 services. Further details of the threshold adjustment for WWU can be found in appendix 7.
- 6.11. For tier 2 and tier 3 mains, we disagree with a number of the key assumptions adopted by NGGD, SGN and WWU in their investment appraisal. Principally, we do not consider that they have adequately taken into account uncertainty in relation to the future role of gas in providing heat, eg as characterised by DECC's recent heat strategy, as well as uncertainty in relation to asset data and new technologies in developing their investment plans.<sup>22</sup> In order to take into account such uncertainties, we propose to allow investment in low pressure mains only where the investment pays back within 24 years to capture the option value of deferring investment decisions (appendix 7 sets out our reasons for this assumption, and our wider assessment of GDNs' investment appraisal supporting tier 2 and tier 3). Where we have made such adjustments, we have increased operating cost allowances to compensate.
- 6.12. Table 6.2 sets out our proposed adjustments to iron mains volumes to take into account these factors. As set out in the table, we have allowed all tier 2 and 3 mains proposed by NGN (as we consider all of the proposed volume is justified on Cost Benefit Analysis (CBA) grounds). By contrast, we have not allowed any mains for WWU. We set out the reasons for our adjustment to GDNs' proposed volumes in appendix 7.

---

<sup>22</sup> See: DECC (March 2012) The Future of Heating: A strategic framework for low carbon heat in the UK. <http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/heat/4805-future-heating-strategic-framework.pdf>

**Table 6.2: Tier 2 below threshold and Tier 3 costs and workload**

	<b>GDN submitted workload (km)</b>	<b>Disallowed workload (km)</b>	<b>Our proposed workload (km)</b>
NGGD EoE	163	159	5
NGGD Lon	441	388	54
NGGD NW	368	340	28
NGGD WM	282	282	-
<b>NGGD total</b>	<b>1254</b>	<b>1168</b>	<b>86</b>
<b>NGN</b>	<b>191</b>	<b>-</b>	<b>191</b>
SGN Sc	30	15	15
SGN So	85	85	-
<b>SGN total</b>	<b>115</b>	<b>100</b>	<b>15</b>
<b>WWU</b>	<b>214</b>	<b>214</b>	<b>-</b>
<b>Total</b>	<b>1774</b>	<b>1482</b>	<b>292</b>

6.13. We need to make associated adjustments to the risk reduction proposed by GDNs. Table 6.4 below sets out GDNs’ forecasts for the removal of risk based on the Mains Replacement Prioritisation System (MRPS) model, and our proposals taking into account our changes to iron mains abandoned. Our proposed risk removal score is based on the GDNs’ proposed risk scores adjusted on a pro rata basis for disallowed workload, eg if we disallow 10% of mains length we have adjusted the risk removal by 10%.

**RIIO-GD1: Supporting document – Outputs, incentives and innovation**

**Table 6.4: GDNs proposed iron mains at risk, risk reduction, and our proposals**

			NGGD EoE	NGGD Lon	NGGD NW	NGGD WM	NGN	SGN Sc	SGN So	WWU
Primary output Risk reduction	Forecast iron mains risk at beginning of RIIO-GD1	(incidents/year)	0.34	0.28	0.37	0.25	0.28	0.11	0.28	0.14
	Forecast iron mains risk at end of RIIO-GD1	(incidents/year)	0.15	0.12	0.18	0.11	0.15	0.08	0.18	0.03
	GDN forecast risk reduction over RIIO-GD1 period	incidents/year	0.194	0.153	0.187	0.145	0.121	0.038	0.104	0.113
	Ofgem adjusted risk reduction over RIIO-GD1 period	incidents/year	0.176	0.125	0.147	0.122	0.108	0.033	0.105	0.085
	Proposed risk reduction over RIIO-GD1 period	% change	57.0%	55.1%	51.2%	57.7%	44.0%	33.0%	37.1%	80.3%
	Adjusted risk reduction over RIIO-GD1 period	% change	51.5%	45.2%	40.4%	48.8%	39.1%	29.0%	37.5%	60.2%

*Appendix 7 sets out annual risk score values*



**Iron mains abandonment programme - secondary deliverables**

- 6.14. Secondary deliverables supporting the risk removal primary output are: (i) occurrences of gas in buildings; (ii) occurrences of cast iron/spun iron mains fractures and ductile iron mains failures; (iii) length of main “off risk”; (iv) and asset health and risk metrics (which we address in the reliability outputs chapter).
- 6.15. As with risk removed, we propose to adjust the secondary deliverables pro rata to our reduction in iron mains abandonment workload. We set out our proposed secondary deliverables in appendix 7.

**6.16. Our proposals: Risk related incentive mechanisms**

- 6.17. We do not propose to introduce a within-period financial incentive associated with tier 1 non-seed pipe, as proposed by NGGD. We consider that there are specific difficulties in designing an incentive mechanism to reward/penalise marginal improvements in safety. The difficulties relate to defining and measuring the risk output measure (eg how to accommodate dynamic changes in risk), as well as how to determine the marginal reward/penalty to ensure GDNs optimise output delivery.
- 6.18. We also have concerns with the output measure. The proposed output measure, MRPS, is only a proxy measure of the risk of fatalities. It is also dynamic (ie changes over time subject to external factors). Thus, it is difficult to set a robust output measure which would be the basis for the reward/penalty.
- 6.19. Moreover, we also note the current framework provides powerful incentives to deliver improvements in safety risk. For tier 1 (and indeed other tiers), we will require GDNs to demonstrate that they have achieved the required reduction in risk set at the review, as well as the mandated length and other secondary deliverable measures (as described in this chapter). Under our approach, GDNs are incentivised to achieve the risk reduction at minimum cost.
- 6.20. We also note that other output related incentive mechanisms provide incentives for GDNs to optimise pipe selection within tier 1 (and other tiers) within RIIO-GD1. For example, the EEI (as described in chapter 2) provides incentives to select pipes that provide the highest reductions in gas transport losses. The overall framework provides incentives for GDNs to select pipes that result in greatest opex savings, eg in terms of repairs. According to CEPA report, these two factors dominate the benefits associated with iron mains replacement and thus GDNs should be incentivised to optimise iron mains replacement within period.<sup>23</sup>

---

<sup>23</sup> See: CEPA (2010) <http://www.hse.gov.uk/research/rrpdf/rr888.pdf>, p.61

## Other safety risk primary outputs

### Emergency Response

6.21. This primary output requires GDNs to respond to 97 per cent of reported gas escapes within one hour for uncontrolled escapes and two hours for controlled escapes. All the companies have forecast the achievement of the 97 per cent standard in their business plans, and we have set allowances in relation to emergency services to allow them to achieve the standard.

### Repair

6.22. The primary output is in relation to the risk presented by outstanding mains repair work. Table 6.5 set out the GDNs' proposed risk. We propose to require GDNs to maintain the risk scores for the last reported year, 2012-13.

**Table 6.5: GDNs' proposed repair risk scores**


Total accumulative repair risk (x10 <sup>6</sup> )	2014	2015	2016	2017	2018	2019	2020	2021
<b>NGGD EoE</b>	7.51	7.33	7.15	6.95	6.73	6.51	6.27	6.02
<b>NGGD Lon</b>	20.20	20.13	19.99	19.77	19.47	19.13	18.72	18.24
<b>NGGD NW</b>	26.68	26.17	25.59	24.92	24.18	23.34	22.41	21.37
<b>NGGD WM</b>	9.18	9.08	8.97	8.85	8.71	8.55	8.37	8.17
<b>NGN</b>	19.48	19.09	18.71	18.33	17.97	17.61	17.25	16.91
<b>SGN Sc</b>	4.39	4.39	4.39	4.39	4.39	4.39	4.39	4.39
<b>SGN So</b>	24.84	24.84	24.84	24.84	24.84	24.84	24.84	24.84
<b>WWU</b>	20.80	20.70	20.70	20.60	20.40	20.30	20.00	19.70

6.23. The values are the forecast annual network risk associated with the deferral of escapes. The risk values are the cumulative total of all escape risk multiplied by the number of days the escape is deferred. Escape risk is defined by the GDNs in their HSE approved safety cases.

6.24. There is also a secondary deliverable in relation to repairs: to prevent gas escaping within 12 hours of GDNs being informed of an escape, or as soon as is reasonably practicable, under regulation 7 of the Gas Safety (Management) Regulations 1996 (GS(M)R).

### Major Accident Hazard Prevention (MAHP)

6.25. GDNs are required to prepare a major accident prevention policy document (MAPP) under the Control of Major Accident Hazards Regulations 1999 regulations (COMAH).



## **RIIO-GD1: Supporting document – Outputs, incentives and innovation**

GDNs are also required to submit to the HSE a safety case, containing the information required under Schedule 1 of GS(M)R for formal acceptance.

- 6.26. We consider that our proposed cost allowances allow GDNs to meet these statutory requirements.

## 7. Reliability outputs

---

### Chapter Summary

This chapter summarises the proposed output levels in relation to reliability outputs.

#### Questions:

**Question 1:** Do you agree with our proposed reliability outputs, and secondary deliverables?

**Question 2:** Do you agree with our proposed approach to measuring performance in relation to asset health and risk metrics, and asset load/capacity utilisation (see Appendix 10)?

- 7.1. In our March 2011 Strategy Document, we identified the following principal reliability related primary outputs and secondary deliverables:
- the number and duration of interruptions
  - achieving 1:20 obligation
  - maintaining operational performance
  - maintaining network records
  - asset health and risk metrics
- 7.2. The following sections discuss our proposals for each of these output categories, and secondary deliverables. We discuss our approach to assessing asset health and risk metrics in Appendix 10.

### Loss of supply

- 7.3. Maintaining low levels of unplanned interruptions is a key output requirement for customers. Each year there are approximately 0.5 million interruptions to customers' gas supplies, excluding major incidents. Historically the majority of these interruptions (around 77%) are planned interruptions, ie associated with work to replace network assets. The remaining interruptions were unplanned, and approximately 60% of these interruptions were due to repairs of leaking service pipes.

#### *Planned Interruptions*

- 7.4. We have assessed the GDNs' proposals for planned interruptions and we consider that their proposals are consistent with their repex programmes. However, we have applied an adjustment to the GDNs' planned interruptions volumes in line with our changes to the GDNs' repex programme. The majority of services are connected to mains less than or equal to 8" in diameter (referred to as tier 1 mains under the new HSE iron mains policy) so we have reduced the expected number of planned interruptions by the same percentage adjustment we have applied to the GDNs' tier 1 mains workload. The GDN proposed interruption volumes and durations are set out in Table 7.1 along with our proposals.

## **RIIO-GD1: Supporting document – Outputs, incentives and innovation**

- 7.5. We have reduced the overall duration of interruptions by the same proportion as our mains volume adjustment. SGN did not include interruptions durations in its business plan submission. We have based the duration for Scotland and Southern GDNs on the average annual duration for the period 2008-09 to 2010-11.

### *Unplanned Interruptions*

- 7.6. Over 60% of unplanned interruptions are as a result of a leaking service pipe, and a requirement to relay the service. The principal driver for unplanned interruptions is the number of service condition reports the GDN receives.
- 7.7. There are two opposing factors that determine our adjustment to service condition reports and the associated number of unplanned interruptions. First, where we are disallowing repex we have increased the number of service condition reports and therefore the number of unplanned interruptions. Second, where the GDNs have proposed high levels of deterioration which we do not consider are justified we have reduced the expected number of condition reports and therefore reduced the number of interruptions. (See Table 7.1.)

## **Network capacity**

### *Peak day demand*

- 7.8. The GDNs have a requirement to plan and provide sufficient capacity to ensure that customer's demand for gas is not interrupted during the periods of the highest daily demand that is likely to be experienced one winter in every 20 years. In their plans, all GDNs have committed to meeting the 1 in 20 standard.
- 7.9. The GDNs have set out their views on the future growth in peak day demand which ranges from 1.9% increase over the 10 year period (2010/11-2020/21) for Scotland to an 8% decrease for National Grid. The assumptions are set out in Table 7.2.

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

**Table 7.1: Loss of supply volumes and duration**

<b>Primary Output</b> (associated with non-contractual interruptions)			<b>EoE</b>	<b>Lon</b>	<b>NW</b>	<b>WM</b>	<b>NGN</b>	<b>Sc</b>	<b>So</b>	<b>WWU</b>
No. of planned interruptions	GDN proposed	# of	657,052	410,315	547,598	389,957	447,584	270,680	655,520	446,886
No. of unplanned interruptions	GDN proposed	# of	100,255	88,166	107,940	61,403	85,538	21,888	82,680	97,075
<b>Total interruptions</b>	<b>GDN proposed</b>	<b># of</b>	<b>757,307</b>	<b>498,481</b>	<b>655,538</b>	<b>451,360</b>	<b>533,122</b>	<b>292,568</b>	<b>738,200</b>	<b>543,961</b>
No. of planned interruptions	Ofgem allowed	# of	612,973	380,406	468,417	362,944	396,108	238,514	672,528	418,083
No. of unplanned interruptions	Ofgem allowed	# of	100,932	81,267	93,455	62,439	73,419	20,056	72,627	88,337
<b>Total interruptions</b>	<b>Ofgem allowed</b>	<b># of</b>	<b>713,905</b>	<b>461,673</b>	<b>561,872</b>	<b>425,383</b>	<b>469,527</b>	<b>258,570</b>	<b>745,155</b>	<b>506,420</b>
No. of planned interruptions		% change	-7%	-7%	-14%	-7%	-12%	-12%	3%	-6%
No. of unplanned interruptions		% change	1%	-8%	-13%	2%	-14%	-8%	-12%	-9%
<b>Total interruptions</b>		<b>% change</b>	<b>-6%</b>	<b>-7%</b>	<b>-14%</b>	<b>-6%</b>	<b>-12%</b>	<b>-12%</b>	<b>1%</b>	<b>-7%</b>
Duration of planned interruptions	GDN proposed	(mins - millions of)	307	256	284	194	242			91
Duration of unplanned interruptions	GDN proposed	(mins - millions of)	47	110	83	42	80			49
<b>Total interruptions</b>	<b>GDN proposed</b>	<b>(mins - millions of)</b>	<b>354</b>	<b>366</b>	<b>367</b>	<b>236</b>	<b>322</b>			<b>140</b>
Duration of planned interruptions	Ofgem allowed	(mins - millions of)	286	237	243	181	214	82	210	85
Duration of unplanned interruptions	Ofgem allowed	(mins - millions of)	47	101	71	42	67	139	131	44
<b>Total interruptions</b>	<b>Ofgem allowed</b>	<b>(mins - millions of)</b>	<b>333</b>	<b>339</b>	<b>313</b>	<b>223</b>	<b>281</b>	<b>221</b>	<b>341</b>	<b>129</b>

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

**Table 7.2: Summary company demand forecast**

<b>GDN</b>	<b>Peak day gas demand</b>
<b>NGGD</b>	Decline by 8% over RIIO-GD1 period
<b>NGN</b>	Decline by 3% over RIIO-GD1 period (annual demand forecast to fall by 5%)
<b>SGN</b>	Increase over period 2010/11-2020/21: - 1% (Scotland) - 1.9% (Southern)
<b>WWU</b>	Overall decline in peak demand comprising: - 0.7% increase for Wales South Dist Zone, - 2.3% decrease in SW Dist Zone, - 1.3% decrease in Wales North Dist Zone.

- 7.10. SSGN included 4 capex projects associated with the connection of new customer (or existing interruptible going firm). It stated the projects were required to meet the 1 in 20 standard. We have disallowed the proposed capex associated with these projects as the incremental capacity can potentially be met through interruptible contracts. We have allowed an opex allowance based on the annuity value associated with the avoided cost, where the annuity is calculated over 20 years. The proposed funding is higher than the expected cost associated with securing interruptible contracts but lower than the capital cost, and we consider strikes a correct balance of risk between SGN and the consumer.
- 7.11. We have considered GDNs' requirement for NTS Exit Capacity given the expected changes in peak demand. We propose to adopt GDNs' booked exit capacity volumes in setting cost allowances (up to and including exit capacity booked at the July 2012 auction). Beyond 2015, we propose to assume booked capacity volume growth will be the lower of zero (ie constant volumes) or GDNs forecast growth in booked capacity over the remainder of the RIIO-GD1 price control. As part of Final Proposals, we will set out the assumed volumes by off-take for consistency with the proposed draft licence condition. (See RIIO-T1/GD1: Draft Licence Condition consultation.)

### *Connections*

- 7.12. The GDNs forecast more than 500,000 new connections over the RIIO-GD1 period as set out in table 7.3, and we have accepted the proposed number. The GDNs have a licence requirement to connect any customer that meets the statutory connection requirements. This is the principal output for the connection of customers. We describe connection standards in chapter 5.

**Table 7.3: Summary of GDN forecast connections**

Connections workload	NGGD				NGN	SGN		WWU	Industry
	EoE	Lon	NW	WM		Sc	So		
<i>Services (no.)</i>									
new housing	21,140	4,815	6,254	6,641	15,049	5,865	38,828	21,355	119,946
existing housing (includes FP)	54,080	14,880	37,330	26,760	58,594	57,018	56,978	70,560	376,200
non-domestic	-	-	-	-	5,281	2,861	7,187	6,145	21,474
<b>Total services</b>	<b>75,220</b>	<b>19,695</b>	<b>43,584</b>	<b>33,401</b>	<b>78,924</b>	<b>65,744</b>	<b>102,993</b>	<b>98,060</b>	<b>517,620</b>
<i>of which Fuel poor connections</i>	<i>10,180</i>	<i>2,900</i>	<i>13,340</i>	<i>8,370</i>	<i>12,000</i>	<i>11,000</i>	<i>9,000</i>	<i>10,800</i>	<i>77,590</i>

## Network reliability

- 7.13. The primary output associated with network reliability is maintaining levels of operational performance across the network.
- 7.14. In our Strategy Document we set out a number of secondary deliverables for network reliability. The secondary deliverables will enable us to monitor GDNs' performance (as it provides a leading indicator of performance against the primary output). We discuss the secondary deliverables below.

### Number and value of offtake meter error reports

- 7.15. In their plans, GDNs have stated that gas shippers would like GDNs to improve the accuracy of offtake meters given the importance of accurate meter reading in the gas market settlement process.
- 7.16. The GDNs have forecast investment to modify, update and in some cases replace existing offtake metering assets using newer technology such as installing ultrasonic meters to improve the levels of reliability. Some GDNs have also included proposals for remote monitoring.
- 7.17. All GDNs set out their intention to keep the errors to a minimum. Table 7.4 sets out the 2010-11 actual errors, the GDNs' proposed level of performance and our proposals.
- 7.18. Historically except for SGN, annual metering offtake errors equate to less than 0.04 percent of total throughput. In terms of forecasts, NGGD propose a target level of meter accuracy at 99.9% for the RIIO-GD1 period, ie 0.1 per cent of errors. SGN proposed a target of between 0.1-0.31 per cent for its three LDZs and WWU proposed a level of less than 0.5 per cent. NGN set out the target to have no errors above the classification of low significance (<30 GWh hours) with an overall estimated commodity charge relating to errors of less than £10k per year until 2021.
- 7.19. We consider that there should be a common industry standard. Therefore, we propose to set the secondary deliverable (defined as total offtake metering errors as a proportion of GDNs annual throughput) equal to 0.1 per cent.



**Table 7.4: Total offtake meter errors**

<b>Total errors as % of throughput</b>	<b>2011 (actuals)</b>	<b>GDN proposed 2014-2021</b>	<b>Ofgem Proposed 2014-2021</b>
EoE	0.00%	0.1%	0.1%
Lon	0.03%	0.1%	0.1%
NW	0.00%	0.1%	0.1%
WM	0.01%	0.1%	0.1%
		No errors above the classification of "low significance"	
NGN	0.04%		0.1%
SC	1.21%	0.31%	0.1%
SO	0.21%	SE: 0.1% SO: 0.2%	0.1%
WWU	0.04%	<0.5%	0.1%

*Number and duration of telemetered faults*

7.20. The Strategy Document included two measures for monitoring the level of faults seen on the networks and a measure to gauge the timeliness of the GDNs’ responses:

- (a) The number of telemetered faults requiring action within two hours (“now faults”) multiplied by the time taken to resolve them and divided by the number of telemetered Above Ground Installations (AGIs).
- (b) The number of Pressure Systems Safety Regulations (PSSR) faults which are an ‘imminent danger’ or are ‘significant faults’ which require resolution before the next planned inspection, divided by all AGIs.

7.21. We have accepted the GDNs’ proposed performance levels. These are set out in table 7.5.

**Table 7.5: GDN response to telemetered faults**

<b>Fault * Duration / No. of telemetered AGIs - "Now Faults" (hrs)</b>	<b>2011 (actuals)</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
EoE	103	127	123	119	116	112	108	105	101
Lon									
NW									
WM									
NGN	189	211	196	181	166	151	136	128	120
SC	390	238	238	238	238	238	238	238	238
SO	484	134	134	134	134	134	134	134	134
WWU	114	181	168	153	141	161	182	202	223

- 7.22. We have reviewed the GDNs’ proposed performance on PSSR faults. The safety and reliability working group proposed the inclusion of this measure due to the fact that the GDNs timely response to A1 (“imminent danger”) and A2 (“significant fault”) faults allows the GDNs to limit the deterioration of network assets. A1 faults are classified as the most serious, followed by A2 faults.
- 7.23. NGGD has defined its output proposal as the number of faults as a percentage of the inspections undertaken. The other GDNs have presented the output deliverable as a measure of faults per number of AGIs. We have not proposed any adjustments to the proposed secondary deliverables.

**Table 7.6: Faults as percentage of inspections or per number of AGIs**

Faults as percentage of inspections - PSSR A1 and A2 faults	2011 (actuals)	2014	2015	2016	2017	2018	2019	2020	2021
EoE	8%	8%	8%	7%	6%	6%	6%	5%	5%
Lon	6%	9%	9%	8%	8%	7%	6%	6%	5%
NW	20%	18%	16%	16%	15%	13%	13%	12%	11%
WM	7%	6%	6%	6%	5%	5%	5%	5%	5%

Faults/ No. of AGIs - PSSR A1 and A2 faults	2011 (actuals)	2014	2015	2016	2017	2018	2019	2020	2021
NGN	0.53	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.47
SC	0.435	0.356	0.356	0.356	0.356	0.356	0.356	0.356	0.356
SO	0.326	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209
WWU	0.07	0.073	0.072	0.071	0.07	0.072	0.074	0.076	0.078

*Networks records*

7.24. In our March decision document we stated that we would introduce a licence requirement on the GDNs to develop and maintain accurate data records, and we are working with the industry in the drafting of the condition.

*Decommissioning of gasholders*

7.25. Low pressure (LP) gasholders were built to provide storage capacity to ensure local diurnal gas demand can be safely met. The GDNs have argued that LP gasholders are no longer required as part of their storage strategy because of diminishing gas demand and the availability of newer technologies, such as LTS Linepack or NTS Linepack (“NTS flex”), which are more cost effective in providing diurnal storage solutions.

7.26. The main reason for decommissioning LP gasholders is to avoid the significant operating costs required to comply with the relevant legislations.

7.27. All the GDNs have put forward proposals to decommission and demolish their entire fleet of low pressure (LP) gasholders over a period of eight to 12 years starting from 2013-14. The availability of additional NTS storage in the form of flex has allowed the GDNs to carry out their proposals without the need for any internal storage projects. All GDNs consider that the removal of LP gasholders will not have any detrimental impact on security of supply.

7.28. The GDNs’ proposals represent a continuation of their GDPCR1 strategy: by the end of GDPCR1 most GDNs plan to decommission all their gasholders and

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

some GDNs have started with demolition. WWU, for example plans to purge and demolish 19 of its 28 gasholders by the end of GDPCR1.

- 7.29. Based on our assessment of GDN’s CBA (see Appendix 6), we propose to fund GDNs for the phased demolition of gasholders over a 16-year period. We also propose to identify the number of gas holders demolished as a secondary deliverable. Table 7.7 set out the proposed deliverable.

**Table 7.7: Summary of our gasholder demolition proposals for RIIO-GD1**

GDN	No. of holders at 2012-13	Proposed no. to be demolished		Our proposal as % of GDN
		GDN	Our Proposals	
EoE	59	44	29	67%
Lon	65	37	32	88%
NW	70	43	35	81%
WM	9	6	4	75%
NGN	47	23	23	100%
SC	22	19	11	58%
SO	89	67	44	66%
WWU	15	15	7	50%

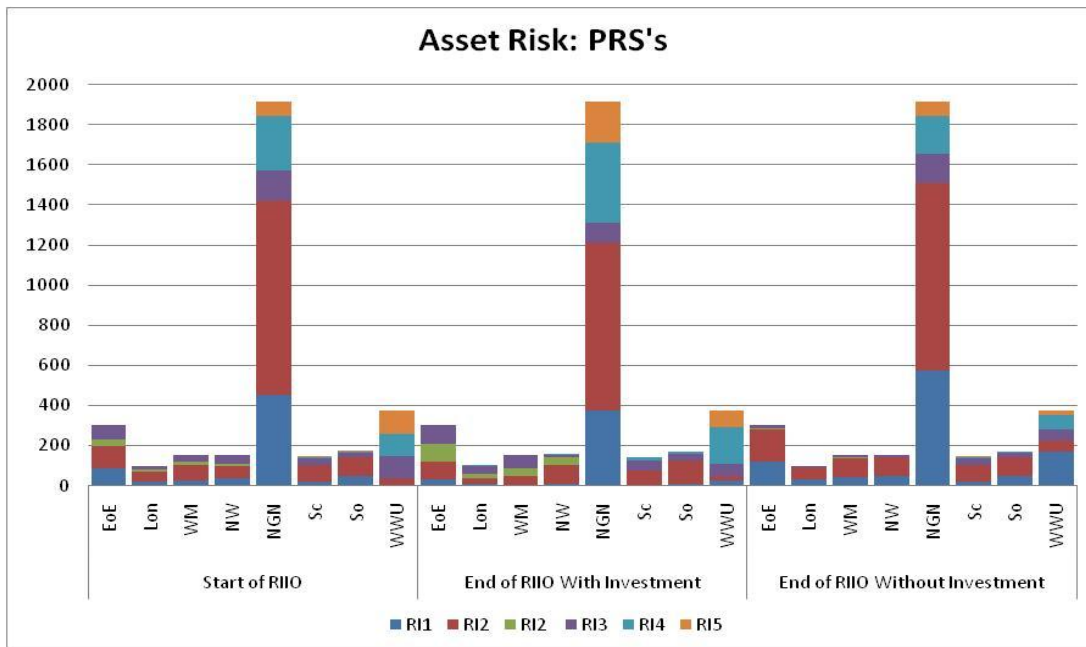
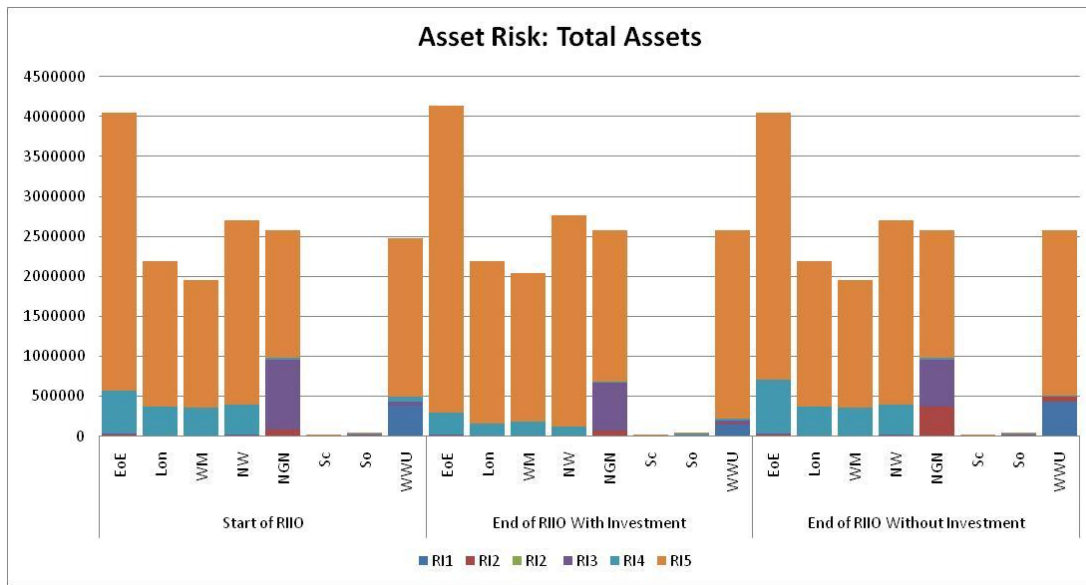
### Asset health/risk metrics

- 7.30. We will set binding NOM asset health and risk metrics for the RIIO-GD1 period. However, there are two additional steps required between IP and FP to finalise these outputs.
- 7.31. First, the GDNs will need to review their proposed outputs in light of our proposed adjustments to volumes of work. We will use GDNs’ April 2012 submissions as our baseline and the GDNs will need to demonstrate how any proposed workload adjustments feed through to the asset health and criticality metrics.
- 7.32. Second, we will continue to work with the GDNs to put the asset health and criticality measures on a more comparable basis. The key inconsistency relates to GDNs approach to components of assets and the derivation of a single score. For example, NGN has presented the individual components of assets as separate assets. This provides greater transparency, and we would expect the GDNs to hold data at this level.
- 7.33. The figures below summarise the GDN proposed improvements in NOMs (the level of risk that will be remaining in the network at the end of RIIO-GD1 with and without their proposed investment). The first graph shows the risk metrics for all assets. The other is an example for PRS assets. The total asset charts are dominated by the impact of services, ie high volume assets. It is therefore


## RIIO-GD1: Supporting document – Outputs, incentives and innovation

not fully representative of GDNs' overall asset risk. However in setting the price control it is important that all assets are captured in the output measure.

7.34. The second graph for PRS offtakes shows the variation in risk and more clearly demonstrates the effects of proposed investment. This also demonstrates variation in approach: some GDNs report on a single installation and some on an asset component basis.



7.35. We will continue to work with the GDNs to deliver the following improvements to the NOMs output measure in time for Final Proposals:



## **RIIO-GD1: Supporting document – Outputs, incentives and innovation**

- Improve consistency between GDNs in reporting health and risk indices
- Review GDNs' resubmitted NOMs reflecting our adjustments to GDNs' workload
- Develop new metrics

## 8. Encouraging innovation

---

### Chapter Summary

This chapter sets out the arrangements that we are proposing to apply to encourage the GDNs to innovate to drive improved outcomes for consumers in RIIO-GD1 and beyond.

### Questions:

**Question 1:** We welcome your views on the proposed level of funding for the licensees' NIA, based on the quality and content of their innovation strategies.

**Question 2:** In relation to funding the NIC for 2013-14, do you support either option 1 (run the NIC and raise the required funds from the winning licensees' customers) or option 2 (no NIC, but roll-over funds to 2014-15). If NIC is delayed beyond 2013-14, what option would you support?

### Introduction

- 8.1. Incentives for innovation are embedded in the RIIO model. Companies are incentivised to innovate to meet outputs in the most efficient way and the longer price control strengthens these incentives.
- 8.2. We set out our innovation framework for RIIO-GD1 in our March 2011 Strategy Document. The RIIO model has a number of elements that encourage innovation, including the longer price control period, the outputs focus and strong efficiency incentives. In addition, we set out the three elements of an innovation stimulus package which the companies have considered in developing their business plans:
  - **Network Innovation Allowance (NIA)** - The NIA is a set allowance that each of the RIIO network licensees will receive to fund small-scale innovative projects as part of their price control settlement.
  - **Network Innovation Competition (NIC)** - The NIC is an annual competition for funding larger more complex networks projects. The NIC will comprise of two competitions - one for gas and one for electricity.
  - **Innovation Roll-out Mechanism (IRM)** - A revenue adjustment mechanism that enables companies to apply for additional funding within the price control period for the rollout of new, proven solutions with demonstrable and cost effective low-carbon or environmental benefits. The mechanism will apply to projects which would not otherwise be commercially viable within the RIIO-GD1 price control period.
- 8.3. We describe our approach to NIA and NIC below. We set out our proposals in relation to the IRM in the Finance and Uncertainty Supporting Document.

## **Network Innovation Allowance (NIA)**

- 8.4. Our March Strategy Document required each network operator to include an innovation strategy as part of their business plan, explaining the company's approach to innovation, its motivation and objectives.<sup>24</sup> We set out that the level of funding available through the NIA would be linked to the innovation strategy. We set out in the Strategy Document that the NIA would be capped at 0.5-1% of allowed revenue. We also set out that companies wishing to spend more than 0.5% of allowed revenue should request that higher amount in their innovation strategy (up to a maximum of one per cent of allowed revenue). In making such a request the companies were required to provide justification for the additional funds. We set out that such requests would be judged by the quality and content of the innovation strategy as well as the company's justification.
- 8.5. In their second business plans, all GDNs requested the maximum allowance of one per cent. However, we do not consider that WWU or SGN's strategy merits funding beyond 0.5%. For NGGD and NGN, we consider their strategies are better justified and we propose funding levels of 0.6%. We provide the reasons for our proposals in appendix 8.

## **Network Innovation Competition**

### **Delay to the gas NIC**

- 8.6. In our Strategy Document, we decided to introduce the NIC to provide funding for projects that would contribute to a low carbon energy sector or provide environmental benefits. We decided to set the maximum available funding for gas distribution and transmission at £20m pa.
- 8.7. In our Strategy Document, we decided to introduce the NIC to provide funding for projects that would contribute to a low carbon energy sector or provide environmental benefits. We decided to set the maximum available funding for gas distribution and transmission at £20m pa.
- 8.8. We set out in our Strategy Document, that, in implementing the NIC, we intended to replicate the Low Carbon Network Fund funding model introduced for DPCR5. This would involve the transfer of funds from all gas licensees to those licensees who win funding through the NIC. However, we set out in our Strategy Document<sup>25</sup> that we had identified a barrier to delivering this proposed funding approach in gas sector.

---

<sup>24</sup> The innovation strategy would not give regulatory approval for any specific project. Rather projects will need to meet the requirements of the NIC and NIA governance arrangements – which are being developed through the course of 2012.

<sup>25</sup> [Decisions on the Network Innovation Competition and timing and next steps for](#)



## RIIO-GD1: Supporting document – Outputs, incentives and innovation


- 8.9. We explained that whilst the Gas Act 1989 allows the Authority to insert provisions into the Gas Transporter licence that require a Gas Transporter to increase its charges to raise such amounts as may be determined and then pay those amounts to gas suppliers and gas shippers. It does not, however, allow the Authority to insert provisions into the licence for the raising and paying of amounts to other Gas Transporters. This differs from the framework in the Electricity Act 1989 which allows for the raising and paying of amounts to all electricity licence holders.<sup>26</sup>
- 8.10. Our view is that, as drafted, the Gas Act does not allow us to implement the NIC in the Gas Sector using the mechanism used in the LCN Fund (ie establish the competition for Gas Transporters). We have raised this issue with DECC and together we are seeking to find a solution at the earliest opportunity. DECC are actively considering the options for proposing an amendment to primary legislation. However, currently it appears unlikely that a legislative amendment could be provided in time for the start of the first Gas NIC, which is due to commence in April 2013.
- 8.11. We have therefore identified two options to address the absence of NIC in at least the first year of RIIO-GD1 and RIIO-T1 (for NGGT):
- *Option 1:* Run the NIC and raise the required funds from the winning licensees' customers (i.e. this could be from either NGGT's or GDN's customers).<sup>27</sup>
  - *Option 2:* No NIC in 2013, and no replacement funding in that year. The lost funds would be rolled-over into subsequent years such that the overall level of funding in RIIO-GD1 is unchanged.
- 8.12. The disadvantage of option 1 is that the costs of a winning project would be borne fully by the winning GDNs' own customers, ie there is no socialisation of costs, whereas the benefits will accrue to all customers. The project costs are potentially a material element of GDNs' total allowed revenues. For example, if a typical GDN (with allowed revenues of around £250 million) were to secure funding for a project of say £15 million (towards the upper-end of funding under LCNF), this could result in an increase in charges of around six per cent. Given the impact of winning a project on their customer's charges,

---

[implementing the Innovation Stimulus. \(Ref 34/12\).](#)

<sup>26</sup> This issue in relation to GT-GT transfers has arisen because before 2004 there was only one gas transportation company (National Grid Gas) and therefore no need to consider the transfer of monies between several transportation companies. When the gas grid was split between different gas transportation companies, the Gas Act 1986 was amended, but ambiguity remains.

<sup>27</sup> Given charges would be raised locally, under this option it would be essential for the winning licensee to demonstrate the benefits of their project for their customers (eg distribution customers), as opposed to gas network customers more widely.



## **RIIO-GD1: Supporting document – Outputs, incentives and innovation**

together with the socialisation of learning, this could discourage participation in the competition by companies.

- 8.13. The option 1 approach would also prevent any independents from entering the competition – since their customers could not be expected to fund such projects in the absence of socialisation.
- 8.14. For these reasons we prefer option 2. Under this option, we would effectively provide the same level of funding as envisaged in our March Strategy Document but over a shorter seven year period, ie from 2014-15 onwards.
- 8.15. However, if the NIC is delayed for more than one year, our preference is likely to be for option 1. In such circumstances, we consider it is more important to run NIC and raise funds from the winning GDNs' customers (and accept no socialisation of costs) than to delay NIC further (and potentially indefinitely).
- 8.16. By the time of final proposals, we should have greater certainty over the prospects of an amendment to primary legislation, and thus whether the delay to NIC is likely to be one year (in which case, we support option 2) or longer (in which case we support option 1). We would welcome respondents' views on our preferred options.

## Appendices

---

<b>Appendix</b>	<b>Name of Appendix</b>	<b>Page Number</b>
1	Consultation Response and Questions	58
2	Summary of outputs, secondary deliverables, and monitoring/enforcement	61
3	Rolling incentive mechanisms	65
4	Customer service and fuel poor network connections	71
5	Connections	75
6	Dealing with uncertainty and investment appraisal	77
7	Safety and environmental outputs and secondary deliverables	84
8	Network Innovation Allowance	92
9	Guidance on aspects of GDNs' investment appraisal (Published March 2012)	96
10	Assessment of asset health, capacity secondary deliverables, and safety risk primary output	105

## Appendix 1 - Consultation Response and Questions

---

1.1. We would like to hear the views of interested parties in relation to any of the issues set out in this document.

1.2. We would especially welcome responses to the specific questions which we have set out at the beginning of each chapter heading and which are replicated below.

1.3. Responses should be received by 21 September 2012 and should be sent to:

- [RIIO.GD1@ofgem.gov.uk](mailto:RIIO.GD1@ofgem.gov.uk)

1.4. Unless marked confidential, all responses will be published by placing them in Ofgem's library and on its website [www.ofgem.gov.uk](http://www.ofgem.gov.uk). Respondents may request that their response is kept confidential. Ofgem shall respect this request, subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.

1.5. Respondents who wish to have their responses remain confidential should clearly mark the document/s to that effect and include the reasons for confidentiality. It would be helpful if responses could be submitted both electronically and in writing. Respondents are asked to put any confidential material in the appendices to their responses.

1.6. Next steps: Having considered the responses to this consultation and subject to the views provided we intend to publish Final Proposals for GDNs and a statutory consultation on implementing licence conditions in December 2012. Any questions on this document should, in the first instance, be directed to:

James Grayburn  
Head of RIIO-GD1  
9 Millbank, London, SW1P 3GE  
020 7901 7000  
[james.grayburn@ofgem.gov.uk](mailto:james.grayburn@ofgem.gov.uk)

**CHAPTER: Two**

**Question 1:** *Biomethane information provision:* We would welcome respondents' views on whether our proposed information provision draft licence condition meets the needs of potential biomethane/entry connectees.

**Question 2:** EEI/ shrinkage incentive:

(a) Should we introduce option A or option B (or an alternative) in relation to the rolling incentive mechanisms for the EEI?

(b) Should we also adopt a rolling incentive mechanism in relation to the commodity cost element of gas transport losses, ie in addition to the EEI?

**Question 3:** Do you have any comments on our proposed shrinkage and losses output levels?

**CHAPTER: Three**

**Question 1:** We would welcome views on our proposed approach to the broad measure, namely:

(a) *Customer survey:* Our proposed weightings for different customer interactions, and scores associated with maximum penalty, target and maximum reward

(b) *Complaints metric:* Our proposed weightings for each complaint element (incl. whether or not to include Energy Ombudsman findings within the metric), and score associated with target and maximum penalty

(c) Overall revenue weightings: we welcome views on one GDN's proposed changes to the weightings of the different elements of the broad measure revenue

**CHAPTER: Four**

**Question 1:** We would welcome your views on the proposed number of fuel poor connections

**Question 2:** We would welcome your views on our proposed approach to CO issues including setting an output measure based on improving CO awareness.

**CHAPTER: Five**

No specific questions

**CHAPTER: Six**

**Question 1:** Do you agree with our proposed approach to assessing non mandatory investment in relation to tier 2 and 3 iron mains, eg based on a 24 year payback period, and consistent with our earlier investment appraisal guidance?

**Question 2:** Do you agree with our proposed outputs levels in relation to risk removed (MPRS), and associated secondary deliverables (see also Appendix 7)?

**Question 3:** Do you agree with our proposals in relation to the other primary safety outputs?

**Question 4:** Do you agree with our proposed approach to measuring performance in relation to safety risk (see also Appendix 10)?

**CHAPTER: Seven**

**Question 1:** Do you agree with our proposed reliability outputs, and secondary deliverables?

**Question 2:** Do you agree with our proposed approach to measuring performance in relation to asset health and risk metrics, and asset load/capacity?

**CHAPTER: Eight**

**Question 1:** We welcome your views on the proposed level of funding for the licensees' NIA, based on the quality and content of their innovation strategies.

**Question 2:** In relation to funding the NIC for 2013-14, do you support either option 1 (run the NIC and raise the required funds from the winning licensees' customers) or option 2 (no NIC, but roll-over funds to 2014-15). If NIC is delayed beyond 2013-14, what option would you support?

## Appendix 2 - Summary of outputs, secondary deliverables, and monitoring/enforcement

---

1.7. Table A2.1 sets out the proposed principal output definitions, as well as secondary deliverables. It also sets out how we intend to monitor GDNs' performance, and how we enforce performance (eg through statutory, licence conditions) or reward/penalise GDNs for their performance.


**RIIO-GD1: Supporting document – Outputs, incentives and innovation**

<b>Output area</b>	<b>Principal output definition</b>	<b>Principal secondary deliverable</b>	<b>Reporting requirements</b>	<b>Incentive mechanism/ enforcement</b>
Environment (broad measure) <sup>1</sup>	<ul style="list-style-type: none"> <li>- Percentage of biomethane capacity connected to the networks</li> <li>- the total capacity (MW) of biomethane enquiries and applications currently in progress but not yet connected</li> <li>- Introduction of (voluntary) connection standards and provision of information for biomethane connections</li> </ul>	n/a	RIG	<ul style="list-style-type: none"> <li>- Publish comparative performance, ie reputational incentive.</li> <li>- Discretionary reward scheme (DRS) for companies that deliver environmental outputs not funded at price review.</li> </ul>
Environment (narrow measure) <sup>2</sup>	<ul style="list-style-type: none"> <li>- Gas transport losses.</li> </ul>	n/a	RIG	<ul style="list-style-type: none"> <li>- The shrinkage/loss levels set out in Environmental Emissions Incentive (EEI) and shrinkage draft licence conditions.</li> <li>- Relevant licence conditions will also set out basis for reward/penalty within period.</li> <li>- FP/licence condition sets out reward/penalty at end of period.</li> </ul>
Customer service	<ul style="list-style-type: none"> <li>- Broad measure of customer service, comprising customer satisfaction survey, complaints metric, and stakeholder engagement</li> </ul>	n/a	<ul style="list-style-type: none"> <li>-Customer satisfaction survey</li> <li>-RIG</li> </ul>	<ul style="list-style-type: none"> <li>- Target performance and maximum reward/penalty for customer survey and complaints metric set out in licence condition.</li> <li>- Stakeholder engagement assessed through panel.</li> </ul>
Social obligations	<ul style="list-style-type: none"> <li>- Number of fuel poor network connections.</li> </ul>			<ul style="list-style-type: none"> <li>- End of RIIO-GD1 review of output performance (or at time of fuel poor network extensions review).</li> </ul>
	CO awareness	NGGD: 2.1m visits and distribution of up to 105,000 alarms	- CO awareness survey	<ul style="list-style-type: none"> <li>- Publish comparative performance. Reputational incentive.</li> </ul>
	Other social issues			<ul style="list-style-type: none"> <li>- Discretionary reward scheme (DRS) for companies that deliver environmental or social outputs not funded at price review.</li> </ul>



## RIIO-GD1: Supporting document – Outputs, incentives and innovation

Output area	Principal output definition	Principal secondary deliverable	Reporting requirements	Incentive mechanism/ enforcement
Connections	<ul style="list-style-type: none"> <li>- Guaranteed standards of performance.</li> <li>- Introduce voluntary connection standards of service for distributed gas entry customers during RIIO-GD1.</li> </ul>			Payments under guaranteed standards of performance.
Safety (mains replacement)	-Safety output risk (based on MPRS)	<ul style="list-style-type: none"> <li>- Gas in buildings (GIB).</li> <li>- Number of fractures.</li> <li>- Length of main off-risk.</li> <li>- Asset health and risk metrics</li> <li>- All proposed values.</li> </ul>	RIG	<ul style="list-style-type: none"> <li>-Primary output measure, and secondary deliverables: end of period review.</li> <li>- Length of main off risk: Health and safety statutory obligation.</li> </ul>
Safety (emergency response)	<ul style="list-style-type: none"> <li>- 97% of uncontrolled gas escapes attended within 1 hr.</li> <li>- 97% of controlled gas escapes attended within 2 hrs.</li> </ul>		Safety case	Licence condition
Safety (repair)	<ul style="list-style-type: none"> <li>- Management of repairs.</li> <li>- Time taken to complete repair by risk category.</li> </ul>		Safety case	<ul style="list-style-type: none"> <li>-Primary output measure: end of period review</li> <li>Health and safety statutory obligation</li> </ul>
Safety (major accident hazard prevention)	<ul style="list-style-type: none"> <li>-Gas Safety (Management) Regulations (1996) (GSM(R)) safety case acceptance by HSE.</li> <li>-Control of major accident hazards (1999) (COMAH) safety report reviewed by HSE.</li> </ul>		Safety case	Health and safety statutory obligation
Reliability (loss of supply)	- Number and duration of interruptions disaggregated by cause (excluding large events).	<ul style="list-style-type: none"> <li>- Asset health and risk metrics</li> <li>- Gasholders demolished</li> </ul>	RIG	End of period review
Reliability (network capacity)	- Achieving 1 in 20 obligation.	- Asset utilisation/capacity charts	RIG	End of period review



**RIIO-GD1: Supporting document – Outputs, incentives and innovation**

<b>Output area</b>	<b>Principal output definition</b>	<b>Principal secondary deliverable</b>	<b>Reporting requirements</b>	<b>Incentive mechanism/ enforcement</b>
Reliability (network reliability)	Maintaining operational performance.	- No. and value of off-take meter error reports - Fault/duration measure	RIG	End of period review

## Appendix 3 – Rolling incentive mechanisms

1.8. In this Section, we briefly set out the proposed mechanism and highlight the differences between option A and option B. In addition, we also set out the proposed incentive values for the carbon value and gas commodity price that we propose to use to calculate the overall reward/penalty (see step 4). The reader should also refer to our spreadsheet model published along with this Supporting Document.

### Option A

1.9. We first explain option A. We then explain option B relative to option A. The algebra for both options is set out in the parallel licence condition consultation.

#### Step 1: Enduring performance

1.10. We propose that companies retain reward or penalty associated with incremental out/underperformance for eight years. We set out an example in Figure A3.1. As set out, the total reward is equal to the incremental out/underperformance in each year retained for a period of eight years, and is equal to the sum of the yellow shaded cells.

1.11. Note, although Figure A3.1 indicates the reward/penalty will partly accrue in RIIO-G2, we intend to fully reward (or penalise) companies at the end of GD1 (as we explain in step 4).

**Figure A3.1: Step 1 - companies retain incremental out/underperformance for eight years**

	RIIO GD1								RIIO GD2							
	yr1	yr2	yr3	yr4	yr5	yr6	yr7	yr8	yr1	yr2	yr3	yr4	yr5	yr6	yr7	yr8
Target (GWh)	100	100	100	100	100	100	100	100								
Actual (GWh)	100	90	80	80	80	80	80	80								
Outperformance (GWh)	0	10	20	20	20	20	20	20								
Incremental outperformance yr1 (GWh)	0	0	0	0	0	0	0	0								
Incremental outperformance yr2 (GWh)		10	10	10	10	10	10	10	10							
Incremental outperformance yr1 (GWh)			10	10	10	10	10	10	10	10						
Incremental outperformance yr2 (GWh)				0	0	0	0	0	0	0	0					
Incremental outperformance yr1 (GWh)					0	0	0	0	0	0	0	0				
Incremental outperformance yr2 (GWh)						0	0	0	0	0	0	0	0			
Incremental outperformance yr1 (GWh)							0	0	0	0	0	0	0	0		
Incremental outperformance yr2 (GWh)								0	0	0	0	0	0	0	0	
Outturn position	0	10	20	20	20	20	20	20	20	10	0	0	0	0	0	0
Total enduring outperformance	160															

1.12. As a matter of algebra, the sum of the incremental out/under-performance retained for eight years equates to the final year out/underperformance multiplied by eight (eg in Figure A3.1 above, reward = eight multiplied by 20GWh = 160GWh).

1.13. Note, to differentiate this element of the reward/penalty from step 2, we refer to this element of the proposed mechanism as the reward/penalty for enduring outperformance.

**Step 2: Non-enduring performance**

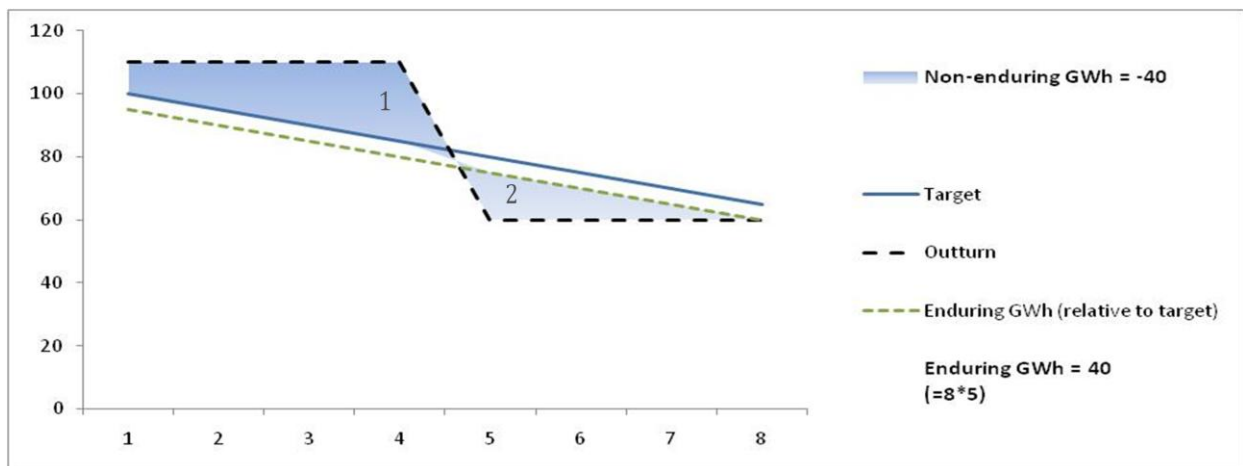
1.14. As set out above, under step 1, companies are rewarded (or penalised) according to their outperformance in the final year of the price review, except for what is reflected in the end-of-period outperformance. This step takes no account of companies’ performance within the price control period. In order to provide an incentive for companies to manage leakage within the review period, we propose to reward performance within the period which is not recognised in step 1. We refer to this step as the reward/penalty for non-enduring performance.

1.15. We have set out two separate examples in figures A3.2 and A3.3 below to demonstrate how we propose to calculate non-enduring reward/penalty.

*Example 1: Underperformance and then outperformance*

1.16. Figure A3.2 sets out an example of the reward/penalty accruing under steps 1 and 2 for a company that initially underperforms against the target but from year five outperforms against the target, with a final year outperformance of 5GWh. The reward under step 1 is equal to eight multiplied by the end-year outperformance (in this case, equal to eight years multiplied by 5GWh or 40GWh).

**Figure A3.2: Underperformance then outperformance: Total reward = 0.**



1.17. Non-enduring performance calculated under step 2 (and not rewarded under step 1) is calculated as the sum of:

- penalty equal to area 1 (defined as above the target in the year and higher than the end year position).

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

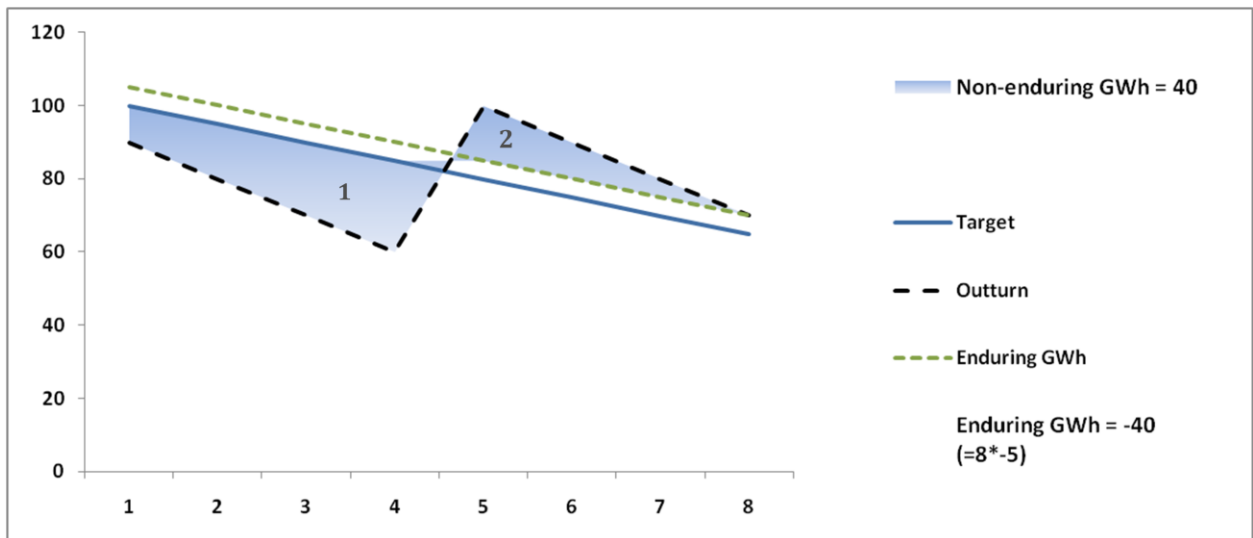
- A reward equal to area 2 (defined as below the target in the year and lower than the end year position).

1.18. The overall reward/penalty in this example is zero (equal to a reward of 40 under step 1, and a penalty of 40 under step 2).

*Example 2: Outperformance and then underperformance*

1.19. Figure A3.3 sets out an example of the reward/penalty accruing under steps 1 and 2 for a company that has a mirror image of the performance of company in Figure A3.2: ie outperforms at first but then underperforms from year five, and underperforms at the end by 5GWh. In this example the reward under step 1 is equal to -40GWh.

**Figure A3.3: Outperformance then underperformance: Total reward = 0**



1.20. Non-enduring performance calculated under step 2 (and not rewarded under step 1) is calculated as the sum of:

- A reward equal to area 1 (defined as below the target in the year and lower than the end year position)
- A penalty equal to area 2 (defined as above the target in the year and higher than the end year position)

1.21. The overall reward/penalty in this example is zero (equal to a penalty of -40 under step 1, and a reward of 40 under step 2).

1.22. The examples also serve to demonstrate the rationale for introducing step 2. If we did not have step 2 the reward/penalty for the two examples set out would be very different (if based on step 1 alone), although the overall profile of performance in both cases is similar (we discuss the rationale for step 2 in more detail in Section 2).

**Step 3: Reward & penalty within period**

1.23. It is not possible to determine the level of enduring and non-enduring performance until the end of the price control period. Hence we will not know the reward/penalty that should accrue to companies under steps 1 and 2 until year eight. However, we do not intend to delay the payment or penalty until the end of the review. Instead, we propose to reward/penalise companies within period as per the current incentive arrangements. This can be viewed as a payment on account. We will then have a true-up at the end of the review to make the company whole.

1.24. The reward/penalty (the payment on account) within the period will be calculated as:

$$[\text{Target (GWh)} - \text{Actual (GWh)}] \times [\text{in year incentive value}] \times [\text{IQI incentive rate}]$$

1.25. For the EEI, the calculation of the reward/penalty within period will be based on the DECC non-traded carbon values set out in the draft licence (£62/MWh rising to £66/MWh), and the company will receive the reward/penalty as a revenue adjustment, after application of the IQI (as set out in the formula).

1.26. For the shrinkage incentive, companies will continue to receive an allowance based on baseline shrinkage volumes multiplied by the annual average day-ahead gas price. This is reflected in the current draft licence. As at GDPCR the proposed mechanism largely eliminates the commodity price risk faced by companies (but leaves companies with volume risk). The company will retain any out/underperformance relative to this annual allowance as a revenue adjustment, subject to the IQI.<sup>28</sup>

**Step 4: reward & penalty at end of period**

1.27. We will need to adjust the reward or penalty in step 3 at the end of the price control period once the level of enduring and non-enduring performance is known. This will be done through a true up at the end of the review. The true up will involve the following steps:

- (i) Calculate the GWh rewarded/penalised within the review as set out in licence (step 3)
- (ii) Calculate the GWh reward/penalty under the proposed mechanism (steps 1+2)
- (iii) Calculate the GWh to be rewarded/ penalised at end of review (steps 1+2 – step 3)
- (iv) Calculate reward/penalty as:

---

<sup>28</sup> These proposals are consistent with our proposed regulatory treatment of EEI and shrinkage set out in a recent note to companies. See: Ofgem (18 July 2011) RIIO-GD1: Proposed treatment of costs outside totex framework

For EEI:

[2020/21 EEI incentive value] x [IQI incentive rate] x [GWh calculated in (iii)]

For shrinkage:

[average day-ahead gas price over RIIO-GD1] x [IQI incentive rate]  
x [GWh calculated in (iii)]

1.28. The rationale for using the annual average day-ahead gas price over the review period for shrinkage (instead of the final year value, as for the EEI) is to avoid using a single year commodity price which could be subject to volatility, eg characterised by a prolonged price spike.

## Option B

1.29. Option B was proposed by NGGD in order to reduce the financial effect of the true up (calculated in step 4 above), which will be applied in the first year of the next price control period.

1.30. Option B is different from option A only in relation to steps 3 and 4 above. Namely, the calculation of rewards and penalties within and at the end of the period is different to that in option A, but the total reward/penalty is the same.

1.31. Option B differs from option A only in relation to steps 3 and 4. The calculation of enduring and non-enduring benefits (ie, steps 1 and 2) is exactly the same as in option A. Thus, the two options are identical in respect of the total incentive revenue for a given leakage/shrinkage performance, and the only difference is in the timing of cash flows associated with incremental out/underperformances.

1.32. Under option B, the cash flow in respect of the annual incremental out/underperformance is multiplied by 8 and is recovered over the rest of the price control period. Namely, every incremental outperformance is assumed to be enduring and paid in full over the remaining years of the price control period. The true up at the end of the period is in respect of non-enduring performance only.

1.33. Formally, let  $OP_t$  be the outperformance in year  $t$  and  $IP_t$  the incremental outperformance in year  $t$  ( $IP_t = OP_t - OP_{t-1}$ ,  $OP_t = 0$  for  $t=2013/14$ ). The reward/penalty in year  $t$  within the period will be calculated as:

For EEI:

$EEI_t = \frac{OP_t - OP_{t-1}}{OP_t} \times [\text{in year EEI incentive value}] \times [\text{IQI incentive rate}]$

For shrinkage:

$$ShI_t = \frac{\text{---}}{\text{---}} \times [\text{average day-ahead gas price in year } t] \times [\text{IQI incentive rate}]$$

For example, the cash flow in year 8 in respect of EEI is

$$EEI_8 = [IP_1 + (8/7) \times IP_2 + (8/6) \times IP_3 + (8/5) \times IP_4 + (8/4) \times IP_5 + (8/3) \times IP_6 + (8/2) \times IP_7 + 8 \times IP_8] \times [\text{in year EEI incentive value}] \times [\text{IQI incentive rate}]$$

### **Comparison of options**

1.34. In line with NGGD's objective in developing option B, this option has a less material end-of-period true up relative to option A. This is because all the enduring benefits are recovered within the period and the true up involves only rewards/penalties associated with non-enduring performance, which cannot be determined before the final year's performance has been identified.

1.35. On the other hand, option B generally involves higher year-on-year revenue volatility within a price control period, and as a consequence larger pricing fluctuations associated with predicting incentive performance. Please refer to our spreadsheet model accompanying this note to compare the options under parameters relevant.

1.36. We note that in option A rewards (or penalties) are better aligned with GDNs' out/underperformance of the baseline, ie GDNs receive the reward (penalty) closer to the period in which the social benefit (cost) in terms of lower (higher) CO2 is incurred. By contrast, option B front-loads the reward (or penalty).

1.37. In choosing between the options, we also need to consider whether we will lag the reward/penalty, consistent with our recent proposals set out in our Charging Volatility consultation.<sup>29</sup> If we lag the incentive revenue, this could potentially address concerns that option B results in year-on-year volatile cash-flows, because network users' will have at least 1 year's sight of resulting charge change.

---

<sup>29</sup> See Ofgem (2012) Mitigating network charging volatility arising from the price control settlement, [http://www.ofgem.gov.uk/Networks/Policy/Documents1/Charging\\_Volatility\\_Cons.pdf](http://www.ofgem.gov.uk/Networks/Policy/Documents1/Charging_Volatility_Cons.pdf) (para 3.54)



## Appendix 4 – Customer service and fuel poor network connections

1.38. This appendix sets out the results for the customer satisfaction and complaints metric survey trials. The trial ran for six months between October 2011 and March 2012. We set out in our Strategy Document that the results from this trial survey would be used to inform the design of the customer satisfaction survey and the complaints metric. Our proposals for the design of the broad measure of customer service incentive are included in Chapter 3 of this document, this appendix highlights some of the analysis we have completed to support these proposals.

1.39. We also set out the annual forecast of fuel poor network connections by GDN.

### Customer satisfaction trial data analysis

1.40. We considered a number of approaches to setting the range around the upper quartile (UQ) level of performance to establish where the maximum penalty and reward would be realised. The results from this analysis are set out in table A4.1 below.

**Table A4.1 - Analysis of customer satisfaction survey trial data**

	Approach	Max reward	UQ score	Max penalty
<b>Connection</b>	1.75 sd from UQ	8.59	8.04	7.49
	0.5sd up, 1.75sd down from UQ	8.19		7.49
	1.75sd from mean	8.36		7.26
<b>Unplanned interruption</b>	1.75 sd from UQ	9.16	8.81	8.46
	0.5sd up, 1.75sd down from UQ	8.91		8.46
	1.75sd from mean	9.03		8.33
<b>Planned interruption</b>	1.75 sd from UQ	8.67	8.09	7.50
	0.5sd up, 1.75sd down from UQ	8.25		7.50
	1.75sd from mean	8.52		7.35

1.41. Table A4.2 provides an example of the rewards/penalties associated with each increase and decrease of 0.05 in score. It assumes that the incentive attracts +/- 0.5% of allowed revenue in total, weighted equally across connections, planned and unplanned works. It illustrates both our and GDNs' proposals on the connections element of the customer satisfaction survey incentive as in this area the respective proposals diverge. The example uses a £250m allowed revenue to illustrate the rewards/penalties in monetary terms for a given year's scores.

**Table A4.2 – Sensitivity of reward / penalty to changes in score**

	UQ	Target max	Target min	Reward per 0.05 score above UQ to maximum reward	Penalty per -0.05 score below UQ to maximum penalty
<b>Unplanned interruption</b>	8.81	9.00	8.00	£109,649	-£25,702
<b>Planned interruption</b>	8.09	8.50	7.50	£50,813	-£35,311
<b>Connection (Ofgem proposals)</b>	8.04	8.50	7.50	£45,290	-£38,580
<b>Connection (GDN proposals)</b>		8.40	7.40	£57,870	-£32,552

1.42. Table A4.3 extends the analysis in table A4.2 to show what incentive revenue would be earned if a GDN achieves a score of 8.4 in each element of this incentive under the assumption that targets are as set out below.

**Table A4.3 – Example incentive calculation**

	Score	Penalty/Reward Ofgem	Penalty/Reward GDNs
<b>Unplanned interruption</b>	8.4	-£210,905	
<b>Planned interruption</b>	8.4	£315,041	
<b>Connections</b>	8.4	£326,087	£416,667
<b>Total</b>		<b>£430,222</b>	<b>£520,802</b>

## Complaints trial data analysis

1.43. Table A4.4 sets out the maximum penalty associated with different standard deviations from the mean score. It also illustrates the score where the maximum penalty would be realised and the penalty associated with different scores. Our proposal is that there is no penalty when the score is 16.57 or lower.

1.44. The final column in table A4.4 illustrates the penalty associated with each 0.05 increase in score between 16.57 and the score associated with the maximum penalty under different standard deviations from the mean. Our proposal is for 1.75 standard deviations from the mean. The illustrative penalty calculation assumes allowed revenue of £250m.

**Table A4.4 – Illustrative penalties and sensitivity of penalty to changes in score**

SD from mean	Max penalty	Penalty with score of 20	Penalty with score of 25	Penalty per 0.05 score above UQ
1.5	28.82	-£350,456	-£860,586	-£5,101
1.75	30.25	-£313,712	-£770,356	-£4,566
2	31.69	-£283,942	-£697,251	-£4,133

### Revenue associated with broad measure incentive

1.45. Table A4.5 sets out the revenue associated with each element of the broad measure incentive in our March Strategy Document and under NGN’s proposals. The calculations assume a GDN with allowed annual revenue of £250m.

**Table A4.5 – Illustrative revenues associated with broad measure of customer satisfaction**

Incentive	March 2011 proposals	NGN proposals
Customer satisfaction survey	+0.5 to -0.5% £1.25m to -£1.25m	+0.8 to -0.5% £2m to -£1.25m
Complaints metric	0 to -0.5% £0m to -£1.25m	0 to -0.5% £0m to -£1.25m
Stakeholder engagement	0 to +0.5% £0m to £1.25m	0 to +0.2% £0m to £0.5m

### Fuel poor network connections

1.46. Table A4.6 sets out the breakdown of forecast annual fuel poor network connections.

**Table A4.6 – Forecast fuel poor network connections by GDN**

		Number of connections:								
Company	Licensee	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	TOTAL
NGGD	East of England	1160	1160	1170	1270	1370	1350	1350	1250	10080
	London	340	340	340	360	380	380	380	360	2880
	North West	1670	1670	1680	1690	1690	1670	1630	1630	13330
	West Midlands	1040	1040	1050	1060	1060	1040	1040	1030	8360
NGN		1500	1500	1500	1500	1500	1500	1500	1500	12000
SGN	Scotland	1375	1375	1375	1375	1375	1375	1375	1375	11000
	Southern	800	800	800	800	800	800	800	800	6400
WWU		1500	1500	1500	1500	1200	1200	1200	1200	10800
<b>Totals</b>		9385	9385	9415	9555	9375	9315	9275	9145	74850
<b>Cumulative</b>		9385	18770	28185	37740	47115	56430	65705	74850	

## Appendix 5 – Connections

---

### Introduction

1.47. This appendix summarises the GDNs' proposals in relation to connection standards for both demand and entry customers.

### GDNs' proposals

1.48. NGGD's business plan sets out its intention to develop a new entry connection process to facilitate the connection of new sources of gas onto its network. However, it does not commit to developing voluntary standards of service for distributed gas connections. Its April 2012 business plan resubmission stated that the distributed gas connections market is in the very early stages of development and so it is too soon to determine the scope of services that customers need to be offered and the timescales they require.


1.49. SGN's business plan sets out its support for developing output measures for distributed gas connections. It suggests that timescales should be aligned with existing gas connections standards of performance as follows:

- respond to an initial enquiry within 15 working days
- issue a feasibility study quotation in response to a request within 15 working days
- issue a feasibility study report within 50 working days
- issue a Connections Agreement within 6 months of the initial enquiry
- where a customer has accepted a Connections Agreement, offer a date for the commencement and substantial completion of work within 20 working days
- where substantial completion has taken place, issue a completion notification within 15 working days.

1.50. WWU's business plan sets out its commitment to work with other GDNs to introduce voluntary standards of service for distributed gas, including arrangements for performance reporting and voluntary compensation payments. It also sets out WWU's view that existing standards of performance for demand should not simply be carried over to distributed gas connections and that standards should not apply where competition exists.

1.51. NGN's business plan sets out its intention to introduce the following voluntary standards of service for distributed gas connections with a minimum performance target of 95 per cent for each:

- respond to initial information enquiries within 10 working days,
- respond to requests for capacity studies within 20 working days.
- respond to requests for indicative connection and quality monitoring within 10 working days, and



## **RIIO-GD1: Supporting document – Outputs, incentives and innovation**

- issues connection quotations within 21 working days.

1.52. SGN intends to publish its performance against these standards on an annual basis. It also made a commitment to work with the wider industry to agree national standards of service for the issuing of quotations, the scheduling of works and the completion of works.

## Appendix 6 - Dealing with uncertainty and investment appraisal

---

1.53. In this appendix, we set out our rationale for adopting a 24-year payback period for all non-mandatory investment. We set out our assessment of GDNs' cost benefit analysis (CBA) in relation to iron mains, and gasholders.

### Dealing with uncertainty in investment appraisal

1.54. This section sets out our proposed approach to dealing with future uncertainty in relation to gas network use, asset data quality, and technology changes, in appraising GDNs' capital investment plans.

1.55. First, we summarise the approach set out in our guidance on aspects of investment appraisal, which we published in response to GDNs' first plans.<sup>30</sup> We then set out GDNs' proposed approach, and our initial proposals for RIIO-GD1.

### March 2012 investment appraisal guidance

1.56. For RIIO-GD1, there is significant uncertainty in relation to: (i) future network flows; (ii) asset data quality, eg asset deterioration rates; and, (iii) availability of technologies such as pipe spraying for managing risk.<sup>31</sup> These factors mean that the payoff to investment undertaken in RIIO-GD1 is uncertain.

1.57. The standard approach to incorporating uncertainty associated with the returns to an irreversible capital investment is to estimate the lost option value if the investment is undertaken.<sup>32</sup> As part of our investment appraisal guidance we required GDNs to include functionality within their CBA model to analyse the net present value (NPV) for different discounted pay-back periods, and present NPV analysis for 16, 24, 32 and 45 years as a means to incorporate an implicit deferral

---

<sup>30</sup> See: Ofgem (March 2012) RIIO-GD1: Guidance on aspects of GDNs' investment appraisal. Attached as Appendix 10.

<sup>31</sup> For example, the industry report commissioned by Redpoint highlights significant uncertainty in relation to future peak day network flows with flows declining from current levels of around 3.3 TWh/day to between 3TWh/day and 0 TWh/day by 2050. Source: Redpoint (October 2010) Gas Future Scenarios Project, and Appendix 1.2.

<sup>32</sup> For example, see Dixit and Pindyck, (1994) Investment Under Uncertainty. p 6. "When a firm makes an irreversible investment expenditure, it exercises, or 'kills,' its option to invest. It gives up the possibility of waiting for new information to arrive that might affect the desirability or timing of the expenditure.... This lost option value is an opportunity cost that must be included as part of the investment."

option value within their investment appraisal. Specifically, in our guidance we stated that:<sup>33</sup>

*"Our preliminary view is that for investment in network assets, to take into account the uncertainty over future network use, we would expect the project to have a positive NPV over a much shorter economic life than 45 years (eg 16 years) to justify inclusion in GDNs' plans. Adopting a shorter economic life provides a heuristic approach to dealing with uncertainty over future network use. Such an approach incorporates an implicit option value or insurance value of deferring the investment decision until a future date when the uncertainty will be at least partially resolved."*

### **GDNs' views**

1.58. In their investment appraisal, NGN adopted a discounted payback of 16 years as a means to incorporate uncertainty over future network use. SGN stated that they adopted a discounted payback period of 16 years to recognise the uncertainty over the future use of gas. However, it appears from our review of its modelling that its investment appraisal is based on a 45-year payback.

1.59. By contrast, both NGGD and WWU used a 45-year payback period to appraise investments, and thus did not incorporate the opportunity cost of the option value within their investment appraisal.

1.60. NGGD agreed that there is uncertainty over future network use. However, it believes our proposed approach to dealing with these uncertainties over future network use (truncating the payback period) is not the correct solution and introduces short-termism into our decision making.

### **Our proposal**

1.61. As our starting point for considering how to incorporate uncertainty into investment decision making, we considered the recent work we have undertaken in the context of gas distribution interruptible contracts.<sup>34</sup>

1.62. As part of our proposed reforms of the interruptible contract auction process, we have recently estimated the (lost) option value associated with investing in incremental capacity on gas distribution networks. As set out in our recent consultation paper, we estimated the option value (as a percentage of the initial project present value or capital investment value) in the range of 17- 25% (and a central point of 22%) drawing on standard techniques for estimating option values.<sup>35</sup>

---

<sup>33</sup> See: Ofgem (March 2012) RIIO-GD1: Guidance on aspects of GDNs' investment appraisal, p4

<sup>34</sup> Ofgem (March 2012) Real Options and Investment Decision Making.

[http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/Real\\_options\\_investment\\_decision\\_making.pdf](http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/Real_options_investment_decision_making.pdf)

<sup>35</sup> See: Ofgem (March 2012) Real Options and Investment Decision Making, Figure 4.6, p .23.



1.63. A heuristic approach to incorporating option values within investment decisions is to increase the discount rate above the WACC or truncate the period over which we discount benefits. For example, we can calculate the payback period equivalent to incorporating an option value of 22% of the capital asset value.

1.64. We have calculated the payback period which is equivalent to adopting an option value of 22%. The equivalent payback period ranges from 22 years (where the discount rate is based on the weighted average cost of capital) to 30 years (using the social rate of time preference (SRTP)).

**Table A6.1: Payback period equivalent to an option value of 22%**

Discount rate	Payback period equivalent to an option value of 22%
<b>SRTP</b>	30
<b>WACC</b>	22

*SRTP = 3.5% (first 30 years), and 3% (>30 years). WACC = 6.1% based on GDPCR1 WACC. Calculated as: = 3.55%\*62.5% + 7.25% / (1-30%)\*(1-62.5%): In order to calculate payback periods for the different option values, we assume the project benefits are constant over the economic life of the asset.*

1.65. We consider that the option values and payback periods set out in table A6.1 provide a useful reference point in considering option values for the non capacity related investment set out in the GDNs’ business plans. However, there are also reasons to suggest that the option value associated with non capacity related investment may differ from the option value of 22%.

1.66. First, in evaluating GDNs’ investment plans, we need to take into account uncertainty in relation to future network use, asset data issues, as well as the development of new technologies, eg spray lining/ pipe insertion. Our estimate of the option value of 22% in relation to incremental capacity investment decisions reflected uncertainty in relation to network flows only but not other sources of uncertainty, and thus potentially understates the option value.

1.67. For example, in relation to data uncertainty, we have considered the impact of GDNs’ assumptions around the deterioration of iron mains which has a material effect on the CBA calculations. GDNs have assumed compounded deterioration rates, which result in very high benefits to mains replacement over the latter part of the life of the iron mains. We have concerns about the reasonableness of the compound growth rates adopted by GDNs, which we consider are uncertain and potentially overstate the expected benefits. The incorporation of an option value within the

---

[http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/Real\\_options\\_investment\\_decision\\_making.pdf](http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/Real_options_investment_decision_making.pdf) In Figure 4.6, we set out an option value (as % of the initial project PV (or capital investment) of 20% for an interruptible contract period of 8 years (ie equating to one price review period), and for central volatility assumption of 7%.

investment appraisal is designed to address uncertainty in relation to key data, ie defer the investment decision until we have an improved understanding of mains deterioration.

1.68. Second, and providing an offsetting effect, there is potentially less uncertainty in relation to the useful economic life of integrity-related expenditure than capacity expenditure. Even in the event of a significant decline in network flows (eg arising from electrification of heat), the network will still need to be maintained to supply the residual loads (and thus, there could be continued benefit in relation to integrity expenditure.)

1.69. We should also differentiate the option value according to the asset class. For example, for investment in relation to Local Transmission System (LTS) assets there are two reasons to suggest that a value of 22% overstates the potential (lost) option value from investing. There is less uncertainty in relation to LTS flows than flows on low pressure mains, as the LTS will need to be maintained even in the event that the low pressure network is rationalised. Combined Cycle Gas Turbines or CCGT (including with carbon capture and storage or CCS) may also constitute an important element of the future UK generation mix in a low carbon energy sector, which would support flows on the LTS. In addition, if LTS assets have a materially longer economic life than 45 years, this would mean a payback period of 45 years already incorporates an implicit option value.

1.70. From the above, we draw the following conclusions:

- Low pressure mains: We consider our estimate of the option value of 22% associated with incremental capacity provides a reasonable estimate of the option value for low pressure mains. In effect, we assume that the benefits associated with integrity expenditure which may (at least in part) accrue irrespective of load, and which supports a lower option value, is offset by the other significant sources of uncertainty (which support a higher option value). We propose to use a payback period of 24 years from the start of RIIO-GD1 (eg by 2037) on the basis of the table above, and the fact that GDNs set out NPV analysis for this precise payback period in their plans.
- Higher pressure mains: We consider that the lost option value from investment is likely to be lower than small pressure mains, and we propose to use 45 years from the start of RIIO-GD1 (eg by 2058).
- Other asset classes: We also propose to use a payback period of 45 years from the start of RIIO-GD1 (eg by 2058) for assets where the future benefits are independent of network flows, and there are no material data quality issues. For example, the benefits associated with gasholder decommissioning will be realised irrespective of future flows, and for this asset class we assume a zero option value (ie a payback of 45 years).

## **Assessment of GDNs' iron mains investment appraisal**

1.71. This sections set out our assessment of GDNs' iron mains investment appraisal, and the principal adjustments to determine the optimal replacement volumes.

### **NGGD**

1.72. NGGD includes CBA for approximately 50 per cent of their proposed low pressure (LP) and medium pressure (MP) workload for tier 2 mains (below the risk threshold) and tier 3 mains. NGGD has based its CBAs on a 45 year life from date of investment; the benefits that have been used include opex savings (repairs), leakage and societal benefits (safety (fatalities, injuries and damage to property) and carbon emissions).

1.73. For MP mains in North London, NGGD identifies various projects over RIIO-GD1 and GD2 and these have been grouped into interdependent schemes. NGGD acknowledges that some of these projects have a negative NPV, but includes them as they form part of an overall scheme.

1.74. We have disallowed all of the workload which was not justified based on CBA. Using our CBA model we have found that none of NGGD's proposed workload for LP pays back within the 24 year threshold. We have found that for MP only 86km (54km in North London) of its proposed workload of 136km (99km in North London) pays back.

### **NGN**

1.75. NGN has submitted CBA for 10 per cent of its high operating costs pipes (those that can realise the greatest benefit) for tier 2 below the threshold and tier 3. NGN has then determined the population of mains to be replaced based on extrapolating the results from the sample to the population as a whole, and applying a reduction factor (to account for the fact that the sample is not representative of the population). NGN has assumed a payback of 16 years from date of investment.

1.76. NGN identifies approximately an annual workload of 40km based on its costs benefit analysis and then identified an additional workload of c.15-20km through creation of efficient projects, which have not been justified by CBA. It has then applied a reduction factor to this 55-60km annual workload and plans to reduce this to 25km per annum. We consider the proposed replacement is justified on CBA grounds, and we propose to fund this level.

## **SGN**

1.77. SGN has provided CBA models for the majority of its capital investment. SGN includes assumed avoided penalties/fines within its CBA. We do not agree with this assumption as avoided penalties/fines potentially represent a transfer as opposed to an economic cost and should be excluded from CBA.

1.78. SGN states that all of its proposed workload would payback within 16 years from the investment date. However, it appears that in fact SGN has included benefits accruing over 45 years within its investment appraisal (in its final year benefit calculation). We have excluded such amounts in our assessment of its CBA.

1.79. Our assessment suggests that none of the workload proposed by SGN's Southern GDN has a positive payback within the 24-year threshold, and that 15 per cent of Scotland's proposed investment. Therefore, we propose to disallow all of SGN's Southern's iron mains replacement of 85km and to disallow around 4km of Scotland's proposed 30km volume.

## **WWU**

1.80. WWU provided a CBA model for the entire population for mains (ie not disaggregated by discrete projects) and for a 45 year payback period only. We requested a flexible CBA model which would enable us to assess whether projects enjoyed a positive payback over different payback periods. Thus, we were unable to assess WWU's proposed investment for our proposed payback period of 45 years, and we have consequently disallowed the full workload for WWU.

## **Gasholder decommissioning**

8.17. All GDNs submitted CBAs or a cost analysis to support their gasholders removal programme.

8.18. Our first step of the assessment was to determine whether there is an economic justification for the removal of gasholders.

8.19. Based on GDNs CBA we constructed our own 'representative' CBA models to examine the net present value of holder demolition. The diverse types of holders, from fixed to spiral column to below and above ground tanks, and the range of holders' size, adds to the challenges in developing a representative CBA for the demolition of the asset.

8.20. Our representative CBA models allowed us to examine the NPV of a holder demolition project under different assumptions regarding demolition costs; avoided maintenance costs; and societal benefits such as reduced leakage and safety risk.

8.21. As we stated in our CBA guidance, we think the appropriate timeframe for a CBA of gasholders is 45 years. We considered that the initial investment—the demolition costs—will be made at a zero capitalisation rate.

8.22. Our analysis showed that under reasonable ‘worst case’ scenarios, the demolition of holders results in a positive NPV after 45 years. Given the large uncertainty regarding societal benefits associated with holders demolition—an uncertainty that was reflected in the wide range of assumptions made by the GDNs—we were particularly interested to examine the CBA without those benefits. Removing societal benefits from our CBA still resulted in a positive NPV for most plausible scenarios under a 45 and 24-year timeframe.

8.23. We recognise that there are some benefits that are not easily quantifiable and were not included in our analysis, such as the visual amenity aspect. In addition, the removal of redundant holder structures allows remediation and development of the site and of land adjacent to the site. These benefits were not captured within our analysis and would act to strengthen the case for demolition.

## Appendix 7 - Safety and environmental outputs and secondary deliverables

---

1.81. This appendix sets out the safety risk scores that we will require GDNs to deliver over the RIIO-GD1 period. We also set out the secondary deliverables that will inform our assessment of the GDNs' performance in relation to their primary output.

1.82. We also set out the basis for our shrinkage output.

### Primary risk output

1.83. Table A7.1 shows the primary output risk removal over the RIIO-GD1 period for submitted and adjusted values resulting from iron mains abandonment workload adjustments.

1.84. In relation to finalising and monitoring GDNs' risk scores for RIIO-GD1, we note the following points:

- We have been unable to validate all of the risk values submitted to us by GDNs, in particular for SGN. We will complete the validation process, and make any required adjustments in time for final proposals.
- GDNs are currently reviewing the MRPS risk output to improve the calculation of risk by incorporating the consequence of an incident in to the model. This may result in changes to risk scores within size bands, and overall risk scores. We will need to take any changes into account in our assessment.

1.85. Table A7.1 shows the primary risk removal output, by year, through the RIIO-GD1 period with adjustments taking account of disallowed abandonment workload. The unit of measurement is the number of incidents per year.

**Table A7.1: Risk removal primary output – GDNs’ business plan submission and our proposals**

		2014	2015	2016	2017	2018	2019	2020	2021	Total over RIIO-GD1 period
NGGD EoE	GDN forecast risk removed	0.028	0.024	0.024	0.023	0.023	0.024	0.024	0.024	0.194
	Ofgem adjusted risk removed	0.025	0.022	0.021	0.021	0.021	0.021	0.022	0.022	0.176
NGGD Lon	GDN forecast risk removed	0.019	0.015	0.017	0.016	0.019	0.024	0.023	0.020	0.153
	Ofgem adjusted risk removed	0.015	0.013	0.014	0.013	0.015	0.019	0.019	0.017	0.125
NGGD NW	GDN forecast risk removed	0.026	0.025	0.024	0.023	0.023	0.022	0.022	0.022	0.187
	Ofgem adjusted risk removed	0.021	0.020	0.019	0.018	0.018	0.018	0.017	0.017	0.147
NGGD WM	GDN forecast risk removed	0.019	0.019	0.018	0.018	0.018	0.018	0.018	0.018	0.145
	Ofgem adjusted risk removed	0.016	0.016	0.015	0.015	0.015	0.015	0.015	0.015	0.122
NGN	GDN forecast risk removed	0.022	0.015	0.013	0.013	0.013	0.014	0.020	0.011	0.121
	Ofgem adjusted risk removed	0.019	0.013	0.012	0.012	0.012	0.013	0.018	0.010	0.108
SGN Sc	GDN forecast risk removed	0.008	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.038
	Ofgem adjusted risk removed	0.007	0.004	0.004	0.003	0.003	0.004	0.004	0.004	0.033
SGN So	GDN forecast risk removed	0.023	0.012	0.011	0.011	0.011	0.011	0.012	0.012	0.104
	Ofgem adjusted risk removed	0.023	0.013	0.011	0.011	0.011	0.012	0.012	0.012	0.105
WWU	GDN forecast risk removed	0.021	0.019	0.017	0.015	0.012	0.010	0.010	0.009	0.113
	Ofgem adjusted risk removed	0.016	0.014	0.012	0.011	0.009	0.008	0.007	0.007	0.085

## Secondary deliverables

1.86. Table A7.2 sets out our proposed levels for secondary deliverables, ie for (i) length of mains “off risk”; (ii) gas in buildings (GIB) events; and (iii) iron mains fracture and failure events.

### **Length of mains “off risk”**

1.87. GDNs proposed a reduction in the length of mains off risk of between 35% and 45% of the total qualifying at risk mains over the RIIO-GD1 period. As a result of our proposed disallowance of mains abandonment, we have revised the proportion of mains off risk reduce to between 33% and 38% of the total qualifying at risk mains.

### **Gas in buildings events**

1.88. A gas in building (GIB) event sourced from the network is the final stage of the risk path leading up to ignition and the consequences of an explosion. Where gas concentrations reach certain limits, the event is reportable to the HSE under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR).

1.89. In their business plans, we required GDNs to forecast incidences of GIBs over the RIIO-GD1 period for both reportable and non-reportable events. We note that only two GDNs, NGN and WWU, forecast figures for reportable occurrences. GDNs have provided more consistent forecasts for the number of GIBs caused by network failure for any gas concentration level.

1.90. We have revised the GDNs’ GIBs upwards pro rata to our upper proposed levels for length of mains abandoned on a pro rata basis.

### **Iron mains fractures and failures**

1.91. GDNs forecast number of fractures and failures is a function of their iron mains populations. We have increased the expected fractures/failures pro rata to our upper proposed volumes.



**RIIO-GD1: Supporting document – Outputs, incentives and innovation**

**Table A7.2: Safety outputs secondary deliverables**

			<b>EoE</b>	<b>Lon</b>	<b>NW</b>	<b>WM</b>	<b>NGN</b>	<b>Sc</b>	<b>So</b>	<b>WWU</b>
<b>Length of mains off risk</b>	Length of iron mains off risk (proposed)	km	5137	3293	4209	3028	4579	2201	5201	3569
	Adjusted length of mains off risk (adjusted)	km	4644	2700	3319	2559	4072	1939	5250	2677
	Proportion of at risk mains removed (proposed)	% change	39.7%	42.0%	44.7%	39.5%	42.9%	40.0%	34.7%	45.3%
	Proportion of at risk mains removed (adjusted)	% change	35.9%	34.5%	35.3%	33.4%	38.2%	35.3%	35.1%	33.9%
	Percentage reduction in mains off risk from proposed to adjusted lengths	% adjustment	(-9.6%)	(-18.0%)	(-21.1%)	(-15.5%)	(-11.1%)	(-11.9%)	0.9%	(-25.0%)
<b>GIB events</b>	RIDDOR Reportable GIB events - iron mains over RIIO-GD1 period	Number of reportable events	0	0	0	0	339	0	0	4
		% change	-	-	-	-	(-7.7%)	-	-	(-3.9%)
	Adjusted RIDDOR Reportable GIB events - iron mains over RIIO-GD1 period	Number of reportable events	0	0	0	0	377	0	0	5
		% change	(-21.4%)	(-22.0%)	(-21.4%)	(-21.5%)	(-7.7%)	(-37.8%)	(-35.9%)	(-3.9%)
	GIB events (any concentration level) - iron mains over RIIO-GD1 period	Number of events	915	349	1112	651	1157	512	594	589
% change		(-21.4%)	(-22.0%)	(-21.4%)	(-21.5%)	(-7.7%)	(-37.8%)	(-35.9%)	(-3.9%)	
Adjusted GIB events (any concentration level) - iron mains over RIIO-GD1 period	Number of events	1003	412	1347	752	1286	573	588	736	
<b>Fracture &amp; failure events</b>	GDN forecast number of fractures/failures (CI/SI/DI) over RIIO-GD1	Number of events	13441	3993	12362	7421	21844	10386	13001	9099
		% change	(-5.9%)	(-5.9%)	(-5.9%)	(-5.9%)	(-2.0%)	4.8%	(-3.0%)	1.2%
	Ofgem adjusted number of fractures/failures (CI/SI/DI) over RIIO-GD1 resulting from workload disallowance	Number of events	14732	4713	14975	8570	24264	11622	12879	11372
		% change	(-5.9%)							
<b>Emergency Response</b>	Emergency response - proportion of uncontrolled gas escapes attended to within one hour	% uncontrolled gas escapes attended to within one hour	97.0%	97.0%	97.0%	97.0%	97.3%	97.0%	97.0%	97.0%
	Emergency response - proportion of controlled gas escapes attended within two hours	% controlled gas escapes attended within two hours	97.0%	97.0%	97.0%	97.0%	97.3%	97.0%	97.0%	97.0%
	Proportion of gas escapes prevented within 12 hours	Average yearly %	42%	43%	34%	36%	57%	60%	60%	40%
	Proportion of gas escapes prevented outside 12 hours	Average yearly %	58%	57%	66%	64%	43%	40%	40%	60%

## **RIIO-GD1: Supporting document – Outputs, incentives and innovation**

### **Tier 2 risk action thresholds**

1.92. The following table sets out the GDNs submitted tier 2 risk action thresholds, and the proposed adjusted values for WWU.

**Table A7.3 GDNs submitted tier 2 risk action thresholds**

<b>GDN</b>	<b>Tier 2 risk action threshold score</b>	<b>Ofgem revised risk action threshold score</b>
<b>NGGD EoE</b>	165	-
<b>NGGD EoE</b>	180	-
<b>NGGD EoE</b>	191	-
<b>NGGD EoE</b>	222	-
<b>NGN</b>	142.88	-
<b>SGN Sc</b>	185	-
<b>SGN So</b>	232	-
<b>WWU (Low)</b>	295	1466
<b>WWU (Medium)</b>	197	282
<b>WWU (High)</b>	91	130
<b>WWU (Very High)</b>	63	90

1.93. In their November 2011 submission, WWU proposed an approach to setting risk thresholds for mains in Tier 2 that was different to the other GDNs, which took into account building density, population density and incident fatality rates in four different location categories based on building density, ranging from very high to low. Ofgem supported this approach in principle, because it appeared to be a more targeted approach at identifying risk.

1.94. Following dialogue with all GDNs and HSE about the methodology for setting the risk thresholds, SGN adopted the approach adopted by NGN and NGG, including the use of an occupancy factor of one person per building. WWU maintained its approach and updated their methodology with revised risk thresholds for each location category.

1.95. We do not consider that WWU has presented sufficient empirical evidence to substantiate their revised thresholds or that the other GDNs have substantiated the assumption used for occupancy. Nevertheless, we recognise that there is an absence of data that necessary to transition from the use of MRPS as a means of predicting the risk of an incident to a more robust approach of estimating the overall risk to people from iron mains.

1.96. We are also aware of the GDNs as duty holders and of the role of HSE in ensuring that the arrangements for risk management proposed by the GDNs satisfy those duties. In view of the fact that the methodologies proposed by each of the GDNs were acceptable to HSE, we have used the proposed risk thresholds as the basis for setting allowances. However, in the case of WWU, it was necessary to adjust the risk thresholds proposed because the methodology effectively used a

lower figure of the number of fatalities per incident than that used by the other GDNs.

**Adjustment of WWU Tier 2 Risk Thresholds**

1.97. Work commissioned by the GDN companies<sup>36</sup> using national incident data, established, with a confidence of 99%, that the number of fatalities per incident from iron mains does not exceed 0.444. This number was rounded to 0.45 fatalities per incident.

1.98. WWU flexed the UK fatality rate by taking into account the building densities in different parts of their networks. In applying these different fatality rates, WWU assumed that the UK average fatality rate of 0.45 per incident applied to the location category described as "Medium density". WWU then adjusted the average fatality rate, corresponding to the number of properties per km, as indicated in the table below:

WWU Location Categories	Properties per km	Fatality Ratios	Risk Threshold
<b>Very High</b>	167	2.64	63
<b>High</b>	103	1.13	91
<b>Medium</b>	89	0.45	197
<b>Low</b>	30	0.03 <sup>37</sup>	295

1.99. By maintaining the same distributions of properties per km specified by WWU but applying the average fatality rate to the average number of properties per km, adjusted risk thresholds are indicated in the table below.

WWU Location Categories	Properties per km	Adjusted Fatality Ratios	Adjusted Risk Threshold
<b>Very High</b>	167	1.84	90
<b>High</b>	103	0.79	130
<b>Medium</b>	89	0.31	282
<b>Low</b>	30	0.02	1466
<b>Average</b>	72.2	0.45	160

**Shrinkage output levels**

1.100. Expected improvements in shrinkage levels are a function of reductions in the iron mains population as well as other operational changes GDNs may introduce in RIIO-GD1, eg in relation to pressure management.

<sup>36</sup> By the Industrial Statistics Research Unit of the University of Newcastle upon Tyne

<sup>37</sup> WWU rounded the fatality ratio from 0.03 to 0.1

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

1.101. GDNs' April submissions on leakage are set out below:

**Table A7.4: GDNs proposed reductions in leakage (GWh pa)**

GWh	2012/13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	Proposed reduction over period
<b>NGGD</b>	<b>1532</b>	<b>1493</b>	<b>1454</b>	<b>1414</b>	<b>1375</b>	<b>1335</b>	<b>1296</b>	<b>1256</b>	<b>1216</b>	<b>21%</b>
EoE	525	513	501	489	478	466	454	442	430	18%
Lon	279	272	264	256	248	240	231	223	214	23%
NW	408	396	384	372	360	348	337	325	313	24%
WM	319	312	304	297	289	282	274	267	259	19%
<b>NGN</b>	<b>445</b>	<b>451</b>	<b>432</b>	<b>414</b>	<b>397</b>	<b>386</b>	<b>376</b>	<b>365</b>	<b>354</b>	<b>20%</b>
<b>SGN</b>	<b>858</b>	<b>821</b>	<b>805</b>	<b>788</b>	<b>773</b>	<b>756</b>	<b>740</b>	<b>724</b>	<b>707</b>	<b>18%</b>
ScGN	237	228	223	218	214	209	205	200	195	18%
SoGN	620	593	582	570	559	547	536	524	512	17%
<b>WWU</b>	<b>423</b>	<b>415</b>	<b>407</b>	<b>399</b>	<b>391</b>	<b>382</b>	<b>374</b>	<b>365</b>	<b>357</b>	<b>16%</b>

1.102. We do not consider that WWU's leakage baselines (incentivised under the environmental emissions incentive or EEI) take sufficient account of the effect of its planned reduction in their metallic mains population. We have therefore applied a downward adjustment to their submitted baselines for consistency with other GDNs' submissions. Specifically, we have adjusted WWU's proposed reductions to equal the proposed reduction set out by SGN's Scotland GDN, as the SGN's GDN proposes an approximate similar reduction in metallic mains at risk (but a much greater reduction in leakage).

1.103. We have also amended all the GDNs' baselines to take account of the adjustments we have made to the repex allowances because we have reduced (in most cases) the length of mains to be decommissioned over GD1. (We have made adjustments on a pro rata basis based on the reduction to the length of mains to be decommissioned.)

1.104. The net effect of both these adjustments is shown below:

**Table A7.5: GDNs and our proposed reductions in leakage (GWh pa)**

GWh	GDN GPCR1 2012/13 leakage baseline GWh	GDN 2020/21 leakage baseline GWh	Submitted GD1 leakage reduction GWh	Our proposed GD1 2020/21 leakage baseline GWh	Our proposed GD1 leakage reduction GWh	GDN proposed reduction (%)	Our proposed reduction (%)
<b>NGGD - EoE</b>	525	430	95	438	87	-18%	-17%
<b>NGGD - Lon</b>	279	214	65	224	55	-23%	-20%
<b>NGGD - NW</b>	408	313	96	330	78	-23%	-19%
<b>NGGD - WM</b>	319	259	60	267	52	-19%	-16%
<b>NGN</b>	445	354	91	363	82	-20%	-18%
<b>SGN - Scotland</b>	237	195	42	199	38	-18%	-16%
<b>SGN - Southern</b>	620	512	108	511	109	-17%	-18%
<b>WWU</b>	423	357	66	365	58	-16%	-14%

1.105. The overall Shrinkage Proposals (following the addition of the respective submitted OUG and Theft figures) are set out below:

**Table A7.6: GDNs and our proposed reductions in leakage (GWh pa)**

<b>GWh</b>	<b>GDPCR1 2012/13 shrinkage baseline GWh</b>	<b>GDN 2020/21 shrinkage baseline GWh</b>	<b>GDN shrinkage reduction GWh</b>	<b>Our proposed 2020/21 shrinkage baseline GWh</b>	<b>Proposed shrinkage reduction GWh</b>	<b>GDN proposed reduction (%)</b>	<b>Our proposed reduction (%)</b>
<b>NGGD - EoE</b>	559	462	97	470	89	-17%	-16%
<b>NGGD - Lon</b>	297	230	67	241	56	-23%	-19%
<b>NGGD - NW</b>	431	333	97	351	80	-23%	-19%
<b>NGGD - WM</b>	334	272	61	280	53	-19%	-16%
<b>NGN</b>	471	380	91	388	82	-19%	-18%
<b>SGN - Scotland</b>	254	212	42	216	38	-17%	-15%
<b>SGN - Southern</b>	653	545	108	544	109	-17%	-17%
<b>WWU</b>	448	381	67	389	59	-15%	-13%

## Appendix 8 - Network Innovation Allowance

---

1.106. This annex set out our reasons for our proposed Network Innovation Allowance (NIA) funding for the GDNs.

### WWU's NIA

#### Our Initial Proposals

1.107. Our Initial Proposals are that WWU's Innovation Allowance (IA) should be set at 0.5% allowed annual revenue. WWU should be able to utilise both the NIC and IRM mechanisms.

#### Innovation strategy and NIA

1.108. WWU submitted an innovation strategy as part of its updated plan. Its strategy set out: the key challenges the company faces; what may change the focus of their innovation plans and key stakeholders WWU intends to engage with. It has also set out a range of innovation deliverables from 2013 onwards.

1.109. WWU has requested an IA of a maximum of 1% of allowed revenues per annum. WWU justify the need for enhanced funding in terms of its experience from managing innovation under the Innovation Funding Incentive in GDPCR1 and the need to accelerate effort towards innovation in RIIO-GD1.

#### *Assessment of WWU's plan*

1.110. We note WWU made a number of improvements made to their strategy between November 2011 and April 2012 resubmission. Primarily WWU clarified what potential innovations could be explored beyond 2013, and clarified their request for funding beyond the default of 0.5%.

1.111. However, we consider the strategy could provide more information on how deliverables beyond 2013 will be prioritised and reviewed to determine their continued relevance. There is limited information on the business processes the companies will have in place assess innovation on an ongoing basis and its justification for funding beyond the default is limited and not linked to the specific challenges the company faces.

1.112. With regard to WWU's justification for additional funding, we note the importance of considering the overall support provided by the innovation stimulus package (NIC, NIA and IRM) together with the opportunities which companies have to fund innovation activities through other revenues. We consider that the base level of NIA funding provides a considerable stimulus for the companies alongside these other incentives. WWU needed to make a clear justification around the additional value that would be delivered by a request for further funding.

1.113. We do not consider that WWU has provided sufficient justification for their proposed additional allowance. We need to be satisfied that an additional allowance will provide clearly defined additional value to existing and future consumers. Therefore we are proposing an NIA of the default 0.5%.

## **SGN's NIA**

### **Our Initial Proposals**

1.114. Our Initial Proposals are that SGN's IA should be set at 0.5% allowed annual revenue. SGN should be able to utilise both the NIC and IRM mechanisms.

### **Innovation strategy and NIA**

1.115. SGN submitted an Innovation Strategy as part of their first business plan submission in November 2012. Following resubmission in April 2012, they did not update their strategy but provided some additional explanation around innovation in their business plan appendices and summary documents.

1.116. SGN requested an innovation allowance of a maximum of 1% of allowed revenues per annum.

#### *Assessment of SGN's plan*

1.117. SGN's innovation strategy was very short in comparison to the other GDNs' strategies and there were limited changes made between business plan resubmissions. Overall, we consider that SGN failed to provide sufficient detail to demonstrate that an additional allowance will provide clearly defined additional value to existing and future consumers.

1.118. SGN has not provided a clear justification for why funding beyond the default of 0.5% is warranted and what benefits any additional funding can bring to consumers over and above the 0.5% default. Therefore we are proposing an NIA of 0.5%.

## **NGN's NIA**

### **Our Initial Proposals**

1.119. Our Initial Proposals are that NGN's IA should be set at 0.6% allowed annual revenue. NGN should be able to utilise both the NIC and IRM mechanisms.

### **Innovation strategy and NIA**

1.120. NGN submitted an Innovation Strategy as part of its updated plan, and provided an additional section on Innovation in their resubmission which sought to provide additional details on their innovation programme and justify funding beyond default of 0.5%.

1.121. NGN requested an innovation allowance of a maximum of 1% of allowed revenues per annum. It stated that without an enhanced level of funding they would only be able to focus on shorter term, less risky “incremental” innovation and that additional funding would be spent on “transformational” innovation that is typically more risky research and development type activities.

### *Assessment of NGN’s plan*

1.122. NGN has provided thorough explanation of the challenges they face. It has done this by providing an overview of six high-level challenges their business faces over the course of GD1 and beyond, and then has subsequently broken this down into specific challenges under each of these. NGN has also provided a detailed annex of potential projects and have labelled each project as high, medium or low value<sup>38</sup> and provided estimated costs for these projects where possible. It has also set out the potential risks, benefits and customer impacts of these projects its strategy also sets out a high level overview of their governance and business process that will be in place to support innovation, which provides some confidence there are processes in place to ensure consumer’s money is well spent.

1.123. However there remain some issues with NGN’s Innovation Strategy. For instance they could be more specific about the methods and results of stakeholder consultations and how stakeholders have influenced the strategy.

1.124. We note that NGN have been clear about the types of innovation they would pursue with the default funding and those innovations they would pursue with an enhanced level of funding. However, it has not demonstrated this justification is supported by stakeholder consultation. We also consider that the base level of NIA funding provides a considerable stimulus for the companies alongside other incentives within the RIIO framework. This should incentivise all types of innovation including incremental and transformational innovations. We do not consider that NGN’s justification has provided sufficient explanation as to why all transformational information would not be possible without funding beyond 0.5% or how this approach delivers value for money to consumers.

1.125. However, on balance, we do consider that the overall quality of the strategy warrants some funding above the default level. As such, we are proposing an NIA value of 0.6%.

---

<sup>38</sup> The innovation strategy will not give regulatory approval for any specific project. Rather projects will need to meet the requirements of the NIC and NIA governance arrangements – which are being developed through the course of 2012.



## **NGGD's NIA**

### **Our Initial Proposals**

1.126. Our Initial Proposals are that NGGD's IA should be set at 0.6% allowed annual revenue. NGGD should be able to utilise both the NIC and IRM mechanisms.

### **Innovation strategy and NIA**

1.127. NGGD submitted an innovation strategy as part of its updated plan. It's strategy set out: the challenges that industry as a whole will face and also the specific challenges they will face; it set out their priority work areas; provided stakeholder feedback and have set out how they will prioritise projects.

1.128. NGGD requested an innovation allowance of a maximum of 1% of allowed revenues per annum. It felt that an enhanced level of funding was required beyond the default of 0.5% to address specific challenges within its business as opposed to those common across all GDNs.

#### *Assessment of NGGD plans*

1.129. We note that NGGD made a number of improvements made to its strategy between November 2011 and April 2012 resubmission. NGGD made an attempt to justify funding beyond the default and provided additional information on the criteria it will use to prioritise innovation investment in the price controls. NGGD has provided a range of challenges that warrant innovation funding and have distinguished between challenges facing the whole gas industry and challenges specific to their business. It has also provided some details of governance processes in place to evaluate the potential value of projects before they can ahead.

1.130. However, there remain some issues with NGGD's innovation strategy. For instance, when discussing stakeholder feedback, NGGD should be more specific about which stakeholders have been consulted and how. They could also be more specific about the potential benefits and how value for money will be delivered within their chosen innovation priority areas.

1.131. We do not consider that NGGD has provided sufficient justification for their proposed additional allowance. We need to be satisfied that an additional allowance will provide clearly defined additional value to existing and future consumers. However, on balance, we do consider that the overall quality of the strategy warrants some funding above the default level. As such, we are proposing an NIA value of 0.6%.

## Appendix 9 - Guidance on aspects of GDNs' investment appraisal (Published March 2012)

---

1.132. Following our initial assessment of the gas distribution networks' (GDNs') business plans, we stated that we would provide guidance on aspects of GDNs' approach to investment appraisal.<sup>39</sup>

1.133. The purpose of this guidance is to introduce a common approach to investment appraisal in order to: (i) facilitate a comparison of GDNs' investment plans; and, (ii) ensure consistency with investment appraisal in a regulated context. This appendix focuses on the material issues and differences we identified with GDNs' plans (eg in relation to discount rates, economic asset lives, and sensitivity analysis) and is not intended as a comprehensive guidance to investment appraisal. In undertaking investment appraisal, the GDNs should draw on the HM Treasury Green Book.<sup>40</sup> The additional guidance we set out below is consistent with the Green Book.

1.134. A key aspect of our assessment of GDNs' second plans will be their consistency with the investment appraisal guidance set out in this appendix. As part of their second business plan submissions, we require GDNs to submit their CBA spreadsheet models and supporting documents for all areas where they have employed CBA, and to confirm that their analysis is consistent with the framework set out (or alternatively identify the areas where it is not, and the reason for departing from it). We have also developed a spreadsheet model along with this guidance which we will require the GDNs to submit as part of their 27 April business plan submission.

1.135. This appendix covers the following areas:

- Identification of options
- Identification and quantification of costs and benefits
- Time period for discounting costs and benefits
- Sensitivity analysis
- Decision rule
- Affordability
- Link to business plans

---

<sup>39</sup> Ofgem (February 2012) Initial assessment of RIIO-GD1 business plans, para 3.12  
[http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/120217\\_GDN\\_initial\\_assessment\\_annex.pdf](http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/120217_GDN_initial_assessment_annex.pdf)

<sup>40</sup> HM Treasury (2003) Green Book. See: [http://www.hm-treasury.gov.uk/data\\_greenbook\\_index.htm](http://www.hm-treasury.gov.uk/data_greenbook_index.htm)

## Identification of options

1.136. Consistent with the HM Treasury Green Book, GDNs should clearly identify the range of options that were considered to meet the stated aim. The list should include an option that takes the minimum action necessary (a 'do minimum option' or 'base case') against which other options are compared.

1.137. The list of options should include both those that have been considered and rejected before full costing, and those that have been considered and costed, with clear rationale for including/excluding.

1.138. For example, in considering the options in relation to maintain the integrity of a mains pipe, the options could include: the do minimum option; an option based on (heightened) maintenance of the asset; and, replacement of the asset.

## Identification and quantification of costs and benefits

1.139. For the short-list of options, the GDN should identify the costs and benefits of options relative to the base case or do minimum option. We set out guidance in relation to discounting the costs and benefits, valuing of marketed and non-marketed goods, and other assumptions. We address the economic period for the CBA (or economic life of the investment) in section 3.

### (i) Discounting and the cost of capital

1.140. CBA is concerned with social costs and benefits and the Treasury specifies a social time preference discount rate (STPR) for comparing such costs and benefits over time. When CBA includes the costs of proposed new assets that will be privately financed the financing costs need to be included. The Joint Regulatory Group (JRG) has published guidance on this as "*Discounting for CBAs involving private investment, but public benefit*"<sup>41</sup> and this approach, described by the JRG as the Spackman approach, is the approach adopted here. It is the approach adopted by other regulatory bodies, and in comparable circumstances in central government (i.e. where the investment is private but the benefits are public).<sup>42</sup>

1.141. In short, the approach involves discounting all costs (including financing costs as calculated using the weighted average cost of capital (WACC)) and benefits at the STPR. This involves the following two-steps<sup>43</sup>

---

<sup>41</sup> Joint Regulators Group (4 October 2011) Discounting for CBAs involving private investment but public benefit. See: <http://stakeholders.ofcom.org.uk/consultations/discounting-for-cbas/summary>

<sup>42</sup> See for example, Ofwat (19 December 2007) Further Guidance on the use of cost benefit analysis at PR09 <http://www.ofwat.gov.uk/legacy/aptrix/ofwat/publish.nsf/Content/pr0908.html>

<sup>43</sup> Joint Regulators Group (4 October 2011) op. cit., para 3.10

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

- Convert capital costs into annual costs using the company's cost of capital.
- Use the STPR of 3.5% in discounting all costs and benefits, as recommended by the HM Treasury Green Book<sup>44</sup>

1.142. The capital costs should be converted into the equivalent annual costs that are recovered through customers' bills. We will require companies to convert the capital cost into the annual cost using the sum-of-the-years' digits (SOYD) depreciation method in line with our regulatory depreciation policies. The annual capital costs should also be calculated over the assumed economic life of the asset (as we discuss below).

1.143. To convert capital costs into the annual cost recovered through consumers' bills, we require companies to use a pre-tax WACC of 5.4% which is based on the pre-tax allowed rate of return for GDP1 (See table A9.1 for derivation).

### (ii) Financial costs and benefits

1.144. The financial costs and benefits should correspond to the financial/market values set out in the GDNs business plan (where applicable). For example, the expected reduction in any cost of repairs (a benefit) arising from an investment should be consistent with the assumptions on unit repair costs set out in the plan.

1.145. The financial costs and benefits should also include real price effects (RPEs) net of expected productivity improvements. However, GDNs should build functionality within their CBA to enable the analysis of alternative assumptions.

### (iii) Treatment of non-marketed goods

1.146. The CBA should include the non-marketed goods that can be monetised. We expect the principle monetised non-marketed goods to be the value of carbon abatement and the value of preventing fatalities and injuries.

1.147. In relation to carbon abatement values, we require GDNs to use the DECC non-traded carbon values.<sup>45</sup> For the benefits associated with preventing fatalities and injuries, we require GDNs to draw on guidance set out in HM Treasury Green Book<sup>46</sup> and the CEPA April 2011 report.<sup>47</sup>

---

<sup>44</sup> HM Treasury (2003) Green Book, Appendix 6. The Green Book recommends the use of STPR of 3.5% for period 1-30 years declining to 3% for years 31-75.

<sup>45</sup> See:

[http://www.decc.gov.uk/assets/decc/what%20we%20do/a%20low%20carbon%20uk/carbon%20valuation/1\\_20100610131858\\_e\\_@@\\_carbonvalues.pdf](http://www.decc.gov.uk/assets/decc/what%20we%20do/a%20low%20carbon%20uk/carbon%20valuation/1_20100610131858_e_@@_carbonvalues.pdf)

<sup>46</sup> See HM Treasury (2003) op. cit., p 61.

<sup>47</sup> See <http://www.hse.gov.uk/research/rrpdf/rr888.pdf>

1.148. The HSE and JRG guidance notes that a lower discount rate can be used for health and safety benefits.<sup>48</sup> That is, if we assume that that health and safety impacts measured in *today's* monetary value have a constant marginal utility impact over time, such benefits may simply be discounted at the “pure time preference rate” or PTPR for marginal utility.<sup>49</sup> The Green Book estimates the PTPR at 1.5%.<sup>50</sup>

1.149. GDNs should not use the PTPR for discounting DECC's carbon values but instead should use the STPR. This approach is consistent with DECC's and HMT guidance.<sup>51</sup>

1.150. GDNs should also set out any non-marketed impacts or factors that cannot be monetised within the wider investment appraisal.

#### **(iv) Other assumptions regarding discounting**

1.151. The base year should be set at 2012/13. The GDNs should assume that 50% of benefits are realised in the first year of the project.

### **Period for discounting costs and benefits**

1.152. The period for the CBA should be the useful economic life of the asset. The maximum value should be the technical/accounting life assumption of 45 years.<sup>52</sup>

1.153. There is significant uncertainty over future gas distribution network flows, and thus the economic life of new assets and the prospective benefits. For example, the industry report commissioned by Redpoint highlights significant uncertainty in relation to future peak day network flows with flows declining from current levels of around 3.3 TWh/day to between 3TWh/day and 0 TWh/day by 2050.<sup>53</sup>

---

<sup>48</sup> See: HSE (undated) HSE principles for Cost Benefit Analysis (CBA) in support of ALARP decisions. See: <http://www.hse.gov.uk/risk/theory/alarpcba.htm> Applying a 1.5% discount rate is a short cut. It assumes that, before using this 1.5% discount rate, future fatalities and injuries are given the same monetary value (in real terms) as those of today.

<sup>49</sup> NERA (9 August 2007) Discount Rates for the Office of Rail Regulation, p.3

<sup>50</sup> HM Treasury Green Book (2003) op. cit., p. 98.

<sup>51</sup> DECC refers the reader to the HM Treasury Green Book for discounting carbon savings. See: DECC (October 2011) Valuation of energy use and greenhouse gas emissions for appraisal and evaluation, p.11. In turn, the HM Treasury Green Book recommends the use of STPR. See HM Treasury Green Book (2003) op. cit, Appendix 6.

<sup>52</sup> The 45 year technical/accounting life represents our estimate of the average technical/accounting life for GDNs' assets, but predominantly reflects the technical/accounting life of network pipeline assets (as the dominance asset class). Where the investment appraisal concerns an asset with an economic life shorter than 45 years (eg in relation to the replacement of a fleet of vehicles), the GDN should adopt a shorter economic life than the 45 year average.

<sup>53</sup> Redpoint (October 2010) Gas Future Scenarios Project, and Appendix 1.2.

1.154. We require GDNs to consider the uncertainty over the future use of gas networks in modelling the prospective benefits, and in the assumption relating the economic life of the investment. That is, we expect GDNs to consider both the diminution of expected project benefits and potential shorter economic asset lives (relative to 45 years) in the investment appraisal.

1.155. For example, where the expected benefits accruing to the investment are a function of network flows (eg shrinkage), GDNs should consider whether to model a decline in net benefits over time (eg consistent with the range of future gas scenarios set out in ENA Redpoint report as set out in Appendix 1.2). The GDNs should also consider the potential impact on asset lives of any future rationalisation of gas networks in the event of a sharp decline in network flows (eg as characterised by three of the four Redpoint scenarios).

1.156. We note that not all investment decisions will be affected by the uncertainty over future of gas networks. As one potential example, the costs and benefits associated with decommissioning gasholders might be largely unaffected by the uncertainty over future network use. That is, the gasholder will still need to be maintained even where future flows decline to zero.

1.157. We also require GDNs to present sensitivity analysis relative to the central assumption for the economic life of the asset as we discuss below.

1.158. Where GDNs assume economic asset lives less than 45 years, in converting the capital investment cost into a customer bill impact, we expect you to annuitise the investment cost based on SOYD and 45 year asset life for  $x$  years (where  $x < 45$ ), and include the unrecovered investment cost in year  $x$  as a lump sum.<sup>54</sup>

### Assessing risks and uncertainties, and sensitivity analysis

1.159. The GDNs should set out sensitivity analysis for the key risks and uncertainties. Based on our review of the plans, we consider that the main uncertainties/risks relate to: the economic life of the asset (as discussed above); and the current assumed performance of the asset (eg in terms of repairs, public reported escapes (PREs), shrinkage, fault rates etc), and the expected deterioration in the performance of the asset over time.

1.160. In particular, to accommodate uncertainty over the economic life, we expect GDNs to include functionality within their CBA model to analyse the NPV for different pay-back periods, and present NPV analysis for 16, 24, 32 and 45 years. GDNs should also set out the switching value for the economic life of the asset.<sup>55</sup>

---

<sup>54</sup> We have set out the proposed approach in the investment appraisal model.

<sup>55</sup> The HMT Green Book states: *The calculation of switching values shows by how much a variable would have to fall (if it is a benefit) or rise (if it is a cost) to make it not worth undertaking an option. This should be considered a crucial input into the decision as to*

1.161. Our preliminary view is that for investment in network assets, to take into account the uncertainty over future network use, we would expect the project to have a positive NPV over a much shorter economic life than 45 years (eg 16 years) to justify inclusion in GDNs' plans. Adopting a shorter economic life provides a heuristic approach to dealing with uncertainty over future network use. Such an approach incorporates an implicit option value or insurance value of deferring the investment decision (until a future date when the uncertainty will be at least partially) within the investment decision.<sup>56</sup>

1.162. In relation to asset performance, we would expect GDNs to set out a sensitivity based on the assumption of no further deterioration in the asset's performance relative to the base year assumption.

### Decision rule

#### Overall rule

1.163. The CBA analysis should be undertaken at the project level, and (subject to any significant factors that are not monetised) the overall investment plan should constitute all projects which have positive (or strictly non-negative) NPVs. In other words, at a strategic level the GDN should invest up to the point that the marginal project has a NPV greater or equal to zero.

1.164. Where the project has a marginally positive or negative NPV the GDNs should consider the inclusion/exclusion of such a scheme drawing on identification of any non-monetised benefits or costs. As an example, such non-monetised costs/benefits might include (non monetised) engineering judgement on what constitutes an efficient project.

---

*whether a proposal should proceed. It therefore needs to be a prominent part of an appraisal."*

Source: HM Treasury Green Book (2003) para 5.79

<sup>56</sup> Our proposed approach to using a shorter economic life than 45 years is consistent with the proposed changes we have set out for evaluating interruptible gas contract offers where we will also propose to include option values in their evaluation of such contract offers. See: [http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/Real\\_options\\_investment\\_decision\\_making.pdf](http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/Real_options_investment_decision_making.pdf). As set out in para 2.6 of this note, companies adopt a number of rules-of-thumb to incorporate (deferral) option values in their investment decision making, eg adopting a higher hurdle rate than the WACC. The adoption of a shorter economic life than the mean expected life is one such heuristic approach to recognising option values.

### Project and project components

1.165. In some instances GDNs have proposed the replacement of an entire population of an asset class (eg mains or gasholders) on the basis that at the population level the NPV is positive, although within the population of mains/gasholders we expect there are separable projects which have a negative NPV and should be excluded. Consistent with the above decision rule, we require that each individual project within the population has a positive NPV.

1.166. A project can also comprise a number of different components. For example, a GDN might propose a project with the principal aim of replacing a specific leaky main, but also propose the replacement of a contiguous main within the same project (eg on the basis that the marginal cost of replacing the contiguous main is low). In such a case, there are two clear components: the leaky main, and the contiguous main. In this instance, the GDN needs to demonstrate that the separable components have a positive NPV. If the NPV of the contiguous main component has a negative NPV this should be excluded even where the overall NPV of the components taken together is positive.

1.167. We accept that in some instances the rationale for the replacement of the contiguous pipe might be based on engineering judgement rather than explicit cost benefit analysis. In such cases, the engineering judgement supporting the contiguous pipes inclusion (in this case) needs to be set out.

### Gasholders

1.168. To take the example of gasholders, as set out above, we expect the GDN to undertake investment appraisal at the project level. In this case, we consider that the CBA should be undertaken for each individual holder. Of course, assumptions in regard to costs and benefits may be common for specific gasholder types (eg, annual maintenance costs for below ground holders), and NPV analysis for specific holder types can be presented in aggregate where cost and benefit assumptions for each individual holder within the wider group are identical.

1.169. We would expect the CBA to identify separately any costs and benefits associated with remediation beyond the statutory minimum. We will only allow funding for remediation beyond the statutory minimum where the marginal benefit of doing so (eg in terms of increase land values) is greater than the marginal cost of remediation.

### Benefit cost ratios (BCRs)

1.170. GDNs should also present benefit cost ratios (BCR) for the proposed schemes. The BCR is the ratio of discounted benefits to discounted financial costs, and will be greater than 1 for projects with a positive NPV. The BCR should be used to help prioritise projects where there is a funding or delivery constraint. For example, in the context of gasholder decommissioning, the BCR will help identify those schemes that should be prioritised ahead of others.



## Affordability

1.171. The GDN should show the actual customer bill impacts of the proposed investment for each individual asset class as well as the overall investment plan for the period RIIO-GD1 and RIIO-GD2. The impact of the investment programme on customers' bills should be evident from the proposed approach to CBA as discussed above where costs and benefits are set out in terms of customers' bills.

## Links to business plan

1.172. GDNs should clearly show the links between their CBA and the business plan and business plan data tables. For example, the GDNs should show how the workload and cost reductions underpinning the proposed asset investment and CBA plans feed through into the overall business plan proposals.

1.173. Table A9.1 sets out the derivation of the recommended pre-tax WACC.

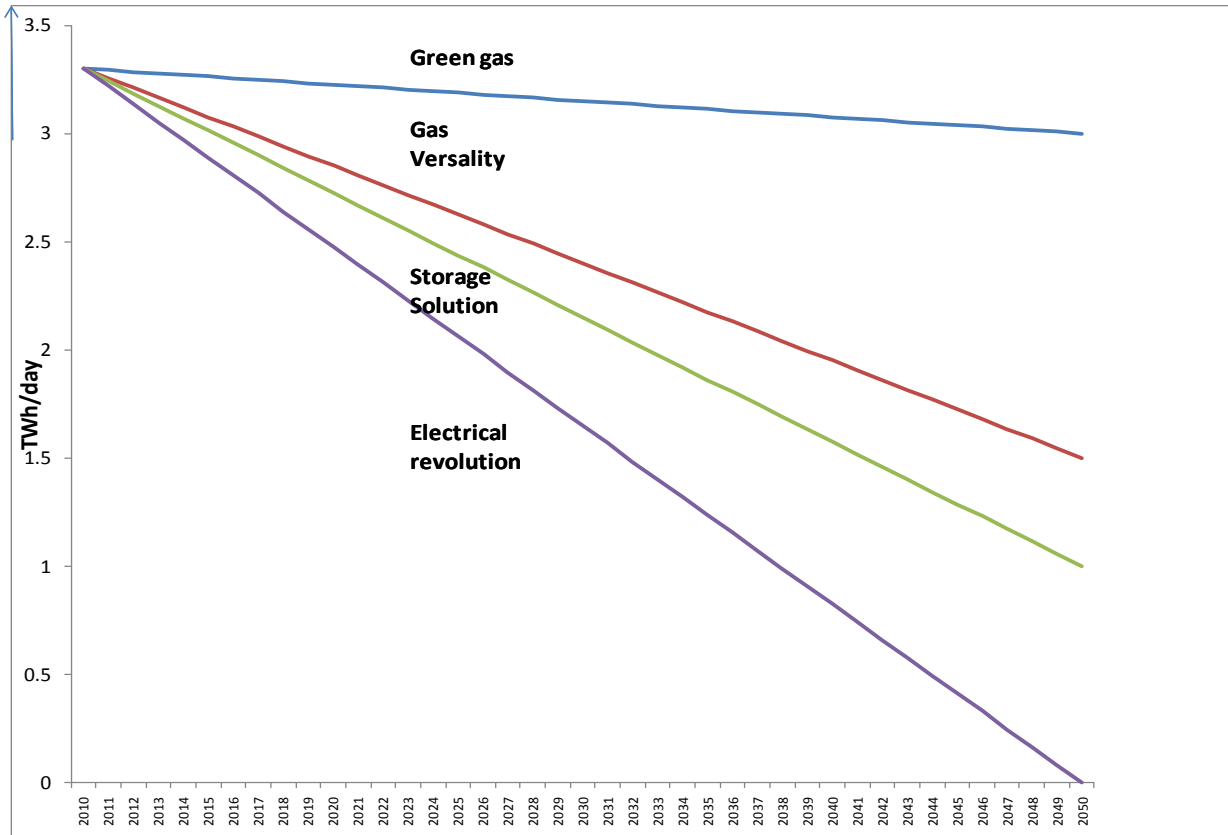
**Table A9.1: Derivation of WACC to convert capital costs into equivalent annual cost**

Ref	Parameter	Value	Calc
C4	CoD	3.55%	
C5	CoE	7.25%	
C6	Gearing	62.50%	
C7	Tax rate	15.00%	Ofgem estimate of marginal effective tax rate, ie incorporating value of capital tax allowances
C8	Vanilla WACC	4.94%	$=C4*C6+C5*(1-C6)$
C9	Pre-tax WACC	5.42%	$=C4*C6+C5/(1-C7)*(1-C6)$

1.174. Figure A9.1 sets out demand scenarios for gas distribution network drawing on an industry commissioned report by Redpoint.<sup>57</sup> For example, Redpoint's green gas scenario is characterised by the rapid development of CCS but slow development of electricity and heat storage technologies. Under this scenario, gas flows decline marginally over the period to around 3TWh/day in 2050. By contrast, under the electrical revolution scenario – characterised by slow CCS development but high heat storage technologies – peak gas flows on the distribution network fall to zero by 2050.

<sup>57</sup> Redpoint (October 2010) Gas Future Scenarios Project, page 32

Figure A9.1: Redpoint Peak Day Gas Distribution Network Flow Scenarios



## Appendix 10 – End of period assessment of asset health, capacity secondary deliverables, and safety risk output

---

1.175. This appendix sets out how we intend to undertake our assessment of GDNs output performance in relation to asset health/risk, asset load/capacity utilisation secondary deliverables, as well as safety risk primary output at the end of RIIO-GD1.

### Evaluation of GDNs' asset health/risk metrics (or NOMs)

1.176. We propose to review the asset health/risk metrics (or network output measures, NOMs) performance in RIIO-GD1 as part of the RIIO-GD2 price control. This section sets out our initial views on how we will undertake this assessment.

1.177. As with the other ex post reviews set out in this section, our review of GDNs performance in relation to NOMs will not consider GDNs' cost efficiency; our assessment will focus only on output performance. For example, a company that meets the output target but underspends will retain the benefit of such outperformance subject to the IQI incentive rate (there will be no ex post clawback).

1.178. In general, we propose to take the NOMs secondary deliverable target for the end of RIIO-GD1 as the opening position in determining funding levels to meet RIIO-GD2 NOMs target. Any under-delivery or over-delivery against the NOMs target during RIIO-GD1 would either require catch-up or be carried forward in order to meet its RIIO-GD2 NOMs target.<sup>58</sup>

1.179. We note that as the GDNs' asset health and criticality measures are at a relatively early stage of development we propose to set the NOMs target based on a delta between asset health and criticality at the end of GD1 without any intervention and the output measures with intervention. This means that if there are any changes in the definition of the asset health and criticality measures the delta measure/target remains constant.

---

<sup>58</sup> For example: *Carry-over*: GDN over-delivers primary output by X units in RIIO-GD1. We assess over-delivery in customer interest. We measure required output for GD2 relative to the output level we expected GDN to deliver in RIIO-GD1. Assume GD2 output target relative to GD1 expectation is 2X. At GD2, we fund GDN for 2X of which GDN has already delivered X. *Catch-up*: GDN under-delivers primary output by X units in RIIO-GD1. We measure required output for GD2 relative to the output level we expected GDN to deliver in RIIO-GD1. Assume GD2 output target relative to GD1 expectation is 2X. At GD2, we fund GDN for additional 2X but GDN has to deliver 3X.

## RIIO-GD1: Supporting document – Outputs, incentives and innovation

1.180. We propose a two tier approach to assess the RIIO-GD1 NOMs performance as follows:

- *Tier 1:* assess the actual NOMs against target as set out in the RIIO-GD1 price control, and reach one of three possible conclusions: on target, above target, or below target;
- *Tier 2:* review the required replacement volumes that underlie the under or above target delivery. This volume will enable us to estimate the costs associated with the under or over delivery against the NOMs target. The estimate will be based on the underlying asset volume and relevant unit costs.

1.181. We would only proceed to tier 2 if the GDNs had not delivered on target. The purpose of the tier 2 assessment would be to identify the asset intervention volumes and costs required to achieve the end of RIIO-GD1 NOMs target. The identified costs associated with under or over delivery would be used to determine a financial reward or penalty, eg where the penalty/reward is set equal to X% of the identified cost. Figure A10.1 set out the assessment process

**Figure A10.1 - NOMs assessment process flow chart**



## RIIO-GD1: Supporting document – Outputs, incentives and innovation

1.182. If a company achieves its NOMs target<sup>59</sup> we would not apply any financial reward or penalty. In assessing whether the company has met the target, we would take into account trade-offs in NOMs between asset classes. As a result the company would be able to under deliver against NOMs targets in one asset class provided that it can demonstrate that it has over-delivered for another asset class, leading to an equivalent level of risk at a network level.

1.183. If a company delivers above target or below target, it would need to justify this variance in its RIIO-GD2 business plan. We would still take the RIIO-GD1 NOMs target as an opening position when setting out the allowance for the company to deliver its RIIO-GD2 NOMs target. This ensures that any under-delivery is not funded twice, and that any over-delivery receives funding provided that is justified.

1.184. As part of agreeing outputs and cost allowances for RIIO-GD2, we propose to determine the extent of justified and unjustified variances, and treat them in the following way:

**Table A10. 1 - Treatment of under/over delivery against NOMs**

	Justified	Unjustified
Over delivery	<ul style="list-style-type: none"> <li>- Cost of the over delivery (net of the amount that has already been funded through the IQI incentive efficiency rate) will be funded on a NPV neutral basis at RIIO-GD2</li> <li>- Reward for delivering additional output</li> </ul>	<ul style="list-style-type: none"> <li>- Cost of the over delivery (net of the amount that has already been funded through the sharing factor) will be funded when output is required</li> <li>- GDN exposed to the financing costs associated with this output plus an additional penalty</li> </ul>
Under delivery	<ul style="list-style-type: none"> <li>- Costs of catching up with the RIIO-GD1 targets will not be funded in the RIIO-GD2 allowance</li> <li>- GDN will be rewarded for an efficient deferral of outputs</li> </ul>	<ul style="list-style-type: none"> <li>- Costs of catching up with the RIIO-GD1 targets will not be funded in the RIIO-GD2 allowance</li> <li>- GDN penalised for an inefficient deferral of outputs</li> </ul>

1.185. We propose to set the size of reward /penalty as a proportion of the costs associated with the under delivery. For example, as part of DPCR5, we have proposed a reward/penalty equal to 2.5% of the costs associated with the over-delivery (or avoided costs associated with the under-delivery).

<sup>59</sup> We are also considering using a dead-band around this target to take into account inherent uncertainties in the assessment methodology.

### True-up of NOMs (for forecast 2021 vs. actual 2021 levels)

1.186. The RIIO-GD2 price control review will be completed prior to the end of RIIO-GD1, ie we will only have access to NOMs data for 2019/2020. Therefore, we propose to use the forecast NOMs for 2020/2021 to evaluate the RIIO-GD1 NOM's performance over RIIO-GD1, and undertake a true-up in RIIO-GD2 to take into account the difference between the forecast and actual NOMs.

### Safety risk (MPRS) primary output

1.187. In chapter 5, we set out our proposed improvements in safety risk. We intend that our review of GDNs' performance against this output measure will follow the proposed review of NOMs, as set out above. Of note, as with NOMs, we propose to assess GDNs against the difference (or delta) between the opening safety risk score and the expected score at the end of RIIO-GD1. This approach acknowledges that there is dynamic growth in safety risk scores over time.

1.188. Specifically, we propose to monitor the GDNs' risk removal by summing the risk score of GDNs' individual pipes at the beginning of the RIIO-GD1 period. To enable this process, GDNs will be required to submit an inventory of pipes, by way of an MRPS report, by 31 March 2013. We will monitor risk reduction by reference back to individual pipe's risk value at the beginning of the RIIO-GD1 period.

### The capacity outputs incentive mechanism for GDNs

1.189. In broad terms our proposal to assess capacity outputs follows the proposed review of NOMs. However, the review is complicated by how we deal with demand risk. Thus, we set out our approach in detail below.

#### *Strategy document*

1.190. In our strategy document, we stated that we would assess GDNs' performance in relation to network capacity against asset utilisation/ capacity charts (ie the secondary deliverable).<sup>60</sup> Our assessment of the secondary deliverables would inform our assessment of whether GDNs have met the primary output of delivering the 1 in 20 peak day demand scenario.

1.191. We proposed to incentivise the delivery of outputs by means of an ex-post review of outputs with *carry forward* or *catch-up* of the incremental output over-delivery or shortfall in the next period. We also proposed introducing penalties linked to financing costs to encourage companies to deliver outputs within period.

1.192. We also noted the possibility of a reopener to cover off the possibility of material changes in required expenditure in the event of differences between expected and outturn demand.

---

<sup>60</sup> Ofgem (March 2011) RIIO-GD1: Outputs and associated incentive mechanisms, p. 60.

*Our views on demand risk*

1.193. We do not propose to protection against demand risk *during* the RIIO-GD1 review period. This is because:

- (i) Most GDNs expect peak day flows to decline over period. As a consequence, capacity related expenditure is minimal, and the financial implication of variations in outturn demand relative to forecast is likely to be relatively immaterial (in the context of overall revenues).
- (ii) We propose to allow uncertainty mechanism in relation to new large connections, which mitigates risk of the impact of specific new loads on the network. (See Finance and Uncertainty Supporting Document.)

1.194. However, we propose to take into account demand outturn relative to forecast at the end of the RIIO-GD1 period when assessing GDNs' performance against the primary output/ secondary deliverables. We set out our proposed approach below.

*Financial penalties, carry-over, and catch-up of outputs*

1.195. We propose that the delivery of capacity outputs is incentivised through ex-post review of output performance with GDNs incurring the cost/benefit of under or over delivery to the next period. That is, we propose GDNs offset over-delivery of asset utilisation against next period targets ("carry-over" or "carry-forward") or required to make good under delivery ("catch-up"). These terms are defined as above.<sup>61</sup>

1.196. As with the proposed review of NOMs and safety outputs, our ex post review will not consider GDNs' cost efficiency; our assessment will focus only on output performance. For example, a company that meets the output target but underspends will retain the benefit of such outperformance subject to the IQI incentive rate (there will be no ex post clawback).

1.197. Below, we describe how we will treat under or over-delivery, and the imposition of penalties to incentivise output performance. We also discuss how we propose to deal with demand risk.

*On target delivery (ie GDN has met primary output)*

1.198. Where demand outturn is less than or equal to forecast at RIIO-GD1, and where GDN delivers the required capacity we will not undertake any action at the end of period review. (Figure A10.2, middle row, left and middle cell).

---

<sup>61</sup> See footnote 58

1.199. Where demand outturn is greater than forecast, and the GDN delivers the required output, we will fund the GDN for the additional capacity that it has delivered during RIIO-GD1 including the financing cost.<sup>62</sup>

1.200. That is, our approach to demand risk is asymmetric (compare outcomes in middle row Figure A10.2).

1.201. As with NOMs, we propose to consider a deadband around the expected output level. We will also consider a deadband around forecast demand relative to outturn demand. Our expectation would be that most GDNs would fall into the middle row, middle cell in Figure A10.2.

*Under-delivery (ie GDN has not met the primary output)*

1.202. Where demand outturn is less than or equal to demand forecast and the GDN has not undertaken the investment in incremental capacity identified at RIIO-GD1 we propose to introduce a penalty. Otherwise there is no consequence from failure to deliver the output. We would propose that the penalty will be equal to the value of the financing benefit of undertaking expenditure plus a proportion of the avoided cost, say 2.5%.<sup>63</sup> (See Figure A10.2, top row, left and middle cells).

1.203. However, where outturn demand is greater than forecast, and GDNs have undertaken at least the level incremental capacity funded at review, then we would not propose a penalty. (See Figure A10.2, top-right).

*Over-delivery (ie GDN has exceeded primary output)*

1.204. We do not consider that we need to introduce penalties where GDNs' *over deliver* within the period. The IQI efficiency incentive rate should incentivise GDNs to minimise expenditure within the period (subject to meeting the required outputs).

1.205. In terms of recognising the over-delivery against the output measure, we note that in general, where GDN has delivered more than funded incremental capacity, and the over-delivery of incremental capacity was in the customer interest, eg facilitated delivery of efficient scale, we would allow GDNs to carry-forward the additional incremental capacity into RIIO-GD2. (Figure A10.2, bottom row).

1.206. However, if the GDN cannot provide customer interest reason for over-deliver, we would not allow carry-over of output until the output is required (in effect, the GDN would incur the financing cost associated with over-delivery, ie additional cost\*IQI incentive rate).

---

<sup>62</sup> That is, at RIIO-GD1, GDN will have incurred additional cost = additional incremental capacity\*IQI. We will fund GDN for additional incremental capacity\*(1-IQI) + financing cost.

<sup>63</sup> GDNs will have the opportunity to justify why they have under delivered, eg in relation to investment lead times. Where the GDNs can justify under delivery no financial penalty will be applied.



## RIIO-GD1: Supporting document – Outputs, incentives and innovation

1.207. We also need to distinguish case where GDN has delivered less than incremental capacity but over-delivered on the capacity measure (Figure A10.2, bottom left.). In this case, the GDN will benefit equal to the avoided expenditure (subject to IQI). That is, the GDN benefits from lower demand. (Figure A10.2, bottom-left).

**Figure A10.2: Overview of end of period capacity output assessment**

Asset utilisation compared to target	Outturn demand compared to forecast at RIIO-GD1		
	Lower	Same	Higher
<p><i>Higher (catch-up)</i></p> <p>(That is, GDN has not delivered primary output/secondary deliverable)</p>	<p>Catch-up to output level required at RIIO-GD2 (but no additional funding)</p> <p>Recovery of financing cost benefit of allowances already received.</p> <p>Penalty = X%*avoided cost</p>	<p>Catch-up to output level required at RIIO-GD2 (but no additional funding)</p> <p>Recovery of financing cost benefit of allowances already received.</p> <p>Penalty = X%*avoided cost</p>	<p><b>Where DN has delivered less than business plan incremental capacity</b></p> <p>Catch-up (=incremental capacity funded – delivered)</p> <p>Recovery of financing cost benefit of allowances already received.</p> <p>Penalty = X%*avoided cost</p> <p><b>Where DN has delivered same as business plan incremental capacity</b></p> <p>No action.</p> <p><b>Where DN has delivered more than business plan incremental capacity</b></p> <p>Carry-forward (=incremental capacity delivered - funded), inc financing cost</p>
<p><i>Same</i></p>	<p>No action. (GDN benefits from lower outturn demand)</p>	<p>No action</p>	<p>Carry-forward (=incremental capacity delivered - funded), inc financing cost.</p> <p>That is, GDN does not bear demand risk.</p>
<p><i>Lower (carry-forward)</i></p> <p>(That is, GDN has delivered primary output/secondary deliverable)</p>	<p><b>Where DN has delivered less than business plan incremental capacity</b></p> <p>For incremental capacity installed &lt; forecast, GDN retains benefit.</p> <p>Carry-forward = 0.</p> <p><b>Where DN has delivered same as business plan incremental capacity</b></p> <p>Carry-forward = 0.</p> <p><b>Where DN has delivered more than business plan incremental capacity</b></p> <p>Carry-forward (= increment capacity delivered – funded) into next period baselines if over-delivery justified.</p>	<p>Carry-forward of over-delivery into next period baselines if over-delivery justified, inc financing cost.</p>	<p>Carry-forward of over-delivery into next period baselines if over-delivery justified, inc financing cost.</p>