ofgem

Making a positive difference
for energy consumers

RIIO-GD1 Annual Report 2014-15

ofgem Making a positive difference for energy consumers

RIIO-GD1 Annual Report 2014-15

Annual report

Reference:

Publication date: 22 March 2016

Response deadline:

Contact: Mick Watson

Team: Head of RIIO Gas Networks

Tel: 020 7901 7416

Email: mick.watson@ofgem.gov.uk

Overview

RIIO-GD1 is the first gas distribution price control, along with its transmission equivalent, that uses the RIIO price control model. RIIO stands for revenue = incentives + innovation + outputs.

This price control began on 1 April 2013 and runs for eight years, to 2021.

This report is for all stakeholders and reviews the progress companies have made in the second year and their forecast for the remainder of the eight-year period. It compares their performance with the outputs they signed up to and the costs they have incurred against allowed revenues.

Context

Gas is an important part of the energy mix meeting the needs of consumers today and tomorrow. There are significant energy policy decisions to take on how we heat and power our homes in future, factoring in the challenges of the energy trilemma – security, affordability and sustainability. It is in this context that many see gas playing a role in both the short and longer term. Gas distribution networks, therefore, need to be managed effectively and efficiently to ensure gas remains available through this price control period and beyond.

Each of the eight gas distribution networks (GDNs) operating in Great Britain is a monopoly provider of gas distribution services. We use our regulatory powers to protect against monopoly abuse and to make a positive difference for present and future energy consumers.

For the GDNs, we help to achieve this by setting the revenue which they are allowed to recover from their customers in return for delivering a range outputs that represent good value for money.

We set these outputs to ensure the GDNs:

- maintain a safe and reliable network
- contribute to sustainability and protect the environment
- provide connections to supply new consumers and support connecting new gas entry points into the network
- meet their social obligations
- provide an agreed standard of service to consumers and other stakeholders.

Associated documents

RIIO-GD1 Annual Report 2013-14

RIIO-GD1 Final Proposals

RIIO GD1 Financial Model (Annual Iteration Processes for 2014-15 and 2015-16)

Consultation on our minded-to position for specified streetworks costs under the RIIO-GD1 price control review

Consultation - RIIO-T1/GD1 uncertainty mechanisms for enhanced security upgrades

Fuel Poor Network Extension Scheme Review final decision document

GDPCR1 End of Period Review

Contents

Executive Summary

In December 2012, we published our final proposals on the revenues the gas distribution networks (GDNs) could recover and the outputs they would deliver for the eight-year period starting 1 April 2013.

At the time of Final Proposals, the GDNs were given an allowance of £17.1 billion for the eight-year period to deliver the required safety, reliability, environmental, new connections, social obligations and customer outputs. In September 2015, we allowed several of the GDNs an additional £140 million of costs as part of the pre-set RIIO Uncertainty Mechanism process. Therefore, in this report, we measure performance against the adjusted allowances of £17.2 billion.

This report covers the second year of the RIIO-GD1 price control period. The GDNs are required to deliver specific outputs as part of the price control arrangements and are incentivised to look continually for new ways to innovate and deliver the outputs at a lower cost than the allowances, benefiting both the companies and their customers. The GDNs are forecasting to outperform the cost allowances by £2.1 billion (12.5%) over the eight-year period. The companies retain approximately 64% of the incentive earned and are given an allowance for tax due on that incentive. Customers are expected to benefit from the remainder through a reduction in the gas distribution component of their bill *(an average reduction of 9.3% is forecast by the end of RIIO-GD1).*

Several factors contribute to the outperformance. These are: a more efficient delivery of outputs; lower than expected increases in real price effects including labour and materials; the slower recovery of the economy leading to a reduced workload in connecting new consumers; and GDNs benefitting from a second mild winter, which meant network assets were less affected by cold weather. GDNs are forecasting that innovation will allow them to take a holistic approach to deliver outputs and this will drive down costs.

The second year performance has shown that GDNs, in the main, can achieve output commitments and reduce their costs. The totex approach to spending and the longer price control period, in particular, have encouraged the GDNs to be more flexible, and to develop and adopt more innovative ways of working. The longer eight-year period has also encouraged the GDNs to implement more efficient and cost-effective long-term strategies, such as changes to their contracting arrangements, which has reduced costs in many areas across the business.

Although outputs are overall in line with or exceeding expectations, we are concerned about some of the safety, reliability and customer satisfaction outputs, particularly in relation to National Grid Gas Distribution (NGGD). For the second year running, it has failed to meet its management of repairs output. We are committed to taking action when companies fail to meet outputs and in this case NGGD has agreed with Ofgem to pay out £3 million to fuel poverty charity National Energy Action to acknowledge their failure of the annual repair risk output for the last two years. We will also be consulting on introducing a licence condition to ensure delivery of this output going forward. Whilst GDNs are incentivised to outperform cost allowances, the RIIO arrangements require them to meet their output commitments. In some cases, output performance is rewarded or penalised through incentives, such as for the customer and environmental outputs.

Safety – all safety outputs are being achieved other than management of repair risk for NGGD, which it has failed for the second year running in three out of four of its GDNs

(North London, North West and West Midlands) as noted above. Repair risk measures the annual safety impact of gas escapes that are not severe enough to justify emergency action, and are scheduled into a non-emergency work programme.

Reliability - the availability of the distribution network was 99.997%. For customer interruptions, several issues came to light during the first two years' reporting. We are working with the GDNs to understand the issues, with a view to reviewing the interruptions output and including it in the licence. We will consult on any changes later this year.

Customer - customer satisfaction improved year-on-year, with the exception of NGGD's London network. All companies scored significantly higher than the target for emergency response and repair score. However, several of NGGD's GDNs fell below the target for both planned interruptions and connections, and will be penalised £2 million through the incentive mechanism based on performance against targets.

Social obligation – the fuel poor extension scheme review was completed in September 2015, with GDNs committing to an increase in the volume of fuel poor connections to over 90,000. So far, the GDNs have connected over 27,000 fuel poor households, around 30% of their revised eight-year commitment.

A primary output for **environment** is the reduction of transportation losses (shrinkage). All companies met this output for the second year and predict they will outperform it over the eight-year period.

As part of the annual performance review, NGGD told us it has revised the plans for replacing the medium pressure iron mains in its London network. This has resulted in a 65% reduction to the planned length of medium pressure iron mains to be replaced during the eight years of the RIIO-GD1 price control, which is funded as part of the overall allowances given to NGGD. We are working with NGGD to clarify how we will treat any failure to meet this output at the end of the period.

Overall, customers are currently receiving a level of service broadly in line with or exceeding expectations. The companies forecast they will maintain this through the remainder of the price control period. Customer service has continued to be strong in Northern Gas Networks (NGN), Scotia Gas Networks (SGN) and Wales and West Utilities (WWU).

All companies are pursuing and sharing innovative ideas using funding from both the network innovation competition and allowance, which aim to benefit customers during and beyond the price control period.

When setting the price control, we said that GDNs could achieve double-digit returns on regulatory equity (RoRE) for exceptional performance. Based on GDNs' forecast performance for the RIIO-GD1 period, we have calculated that returns will range from 8.9% to 11.9%. As stated above, there are incentives in place to drive networks to deliver outputs efficiently, with consumers sharing any underspend in the current price control and benefitting when we consider future cost allowances. We will continue to monitor GDNs' performance to ensure they deliver the outputs they have committed to over the full RIIO-GD1 price control period.

1. Introduction

Each of the eight GDNs owns and operates network assets within a defined geographical area. The GDNs transported 508 TWh (534 TWh when corrected to seasonal normal weather conditions) of gas in the year from the National Transmission System to the homes and businesses of around 22 million consumers in Great Britain. GDNs are responsible for operating, maintaining, and extending the network and for providing a 24-hour gas emergency service. We regulate the GDNs to ensure consumers and other stakeholders receive the network services they need at an efficient cost. We do this by setting the allowed revenues which GDNs can recover from their customers. We specify in their licences the agreed services and standards of performance they must achieve, incentivising good performance and penalising companies for poor performance.

The GDNs are listed in figure 1.1 together with the companies that manage them.[1]

Figure 1.1: Gas distribution networks

Company	Gas Distribution Network (GDN)	GDN abbreviation
National Grid Gas plc (NGGD)	East of England	EoE
	North London	Lon
	North West	NW
	West Midlands	WM
Northern Gas Networks Limited	Northern	NGN
Scotia Gas Networks Limited (SGN)	Scotland	Sc
	Southern	So
Wales & West Utilities Limited	Wales and West	WWU

[1] In November 2015, National Grid publicly stated that it is planning to sell a majority stake in its UK Gas Distribution Network business – Ofgem's Open letter: Sale of National Grid's Gas Distribution Networks Business

RIIO-GD1 is the first price control, along with its transmission equivalent (RIIO-T1), that uses the RIIO (Revenue = Incentives + Innovation + Outputs) price control model. We set out the details of our allowances and the outputs that companies are committed to delivering in our Final Proposals publication in December 2012.[2] The price control began on 1 April 2013 and runs to 31 March 2021.

At the time of setting allowed expenditure for RIIO-GD1, there was uncertainty around some costs and because of this, the price control3 allows the GDNs to apply for relevant adjustments to their allowed expenditure by means of a reopener mechanism, in order to accommodate uncertain costs such as connection charging boundary change costs, enhanced physical site security, large load connections, specified streetworks and smart metering roll-out costs. The GDNs may apply for relevant adjustments during two defined reopener windows, May 2015 and May 2018, with the exception of smart metering adjustments which may be applied for at any time.

In September 2015, we allowed several of the GDNs an additional £122 million of costs as part of the pre-set RIIO Uncertainty Mechanism process and £18 million as part of the Fuel Poor Network Extension Scheme review.

This report gives stakeholders information on the performance of GDNs against their price control obligations and incentives for the second year of the price control. It also provides information on GDNs' updated forecast for the remaining six years. It is structured to reflect the new RIIO framework, and discusses:

- **Revenue:** the revenue we have allowed companies to charge their customers and the impact this has on the average gas bill
- **Incentives:** how incentives have driven cost efficiency, and what this means in terms of companies' overall financial performance
- **Innovation:** innovative practice that lets GDNs deliver more efficiently and effectively, both now and in the future
- **Outputs:** performance achieved against the six output areas, which are:
    - network safety
    - network reliability
    - customer service
    - new connections
    - social obligations
    - protecting the environment.

Companies submit to us an annual report for each of their licensed networks so we can monitor performance against the price control. Our representatives have visited the four companies to discuss technical and financial aspects of their submissions, and we find out further information through supplementary written questions and answers. This process helps us to understand more and gives us an opportunity to ask questions about the accuracy of the data. This report brings together the information gathered from these sources.

[2] Ofgem's final proposals for RIIO-GD1 contain an overview document and a number of supporting annex documents which can be found on the Ofgem website at: https://www.ofgem.gov.uk/publications-and-updates/riio-gd1-final-proposals-%E2%80%93-overview.

[3] Under Special Condition 3F, entitled 'Arrangements for the recovery of uncertain costs'.

Unless otherwise stated, all financial values in this report are in 2014-15 prices.

2. Revenue and customer bill impact

Chapter summary

This chapter explains how revenue allowances set for the gas distribution networks (GDNs) in RIIO-GD1 will affect customer gas bills.

Analysis of gas distribution allowed revenue

2.1. Allowed revenue is the maximum amount of revenue that GDNs may recover each year from network transportation charges. Allowed revenue for 2014-15 was set at £3.63 billion and actual revenue reported by the companies for 2014-15 was broadly consistent with this, with a slight under-recovery of about £2 million which will be carried forward and recovered in future years.

Components of allowed revenue

2.2. Table 2.1 shows the components that made up allowed revenues in 2013-14 and 2014-15.

Table 2.1: Breakdown of maximum allowed revenue for 2013-14 and 2014-15

£m (2014-15 prices)	**2013-14**	**2014-15**
Core price control costs	2,975.3	2,923.5
MOD		(15.9)
Pass - through costs	696.8	708.6
Incentive adjustments	10.3	16.1
Correction factor (previous price control)	3.0	
Maximum allowed revenue	**3,685.5**	**3,632.4**

2.3. The companies' maximum allowed revenue in 2014-15 is made up of the following:

- *Core price control costs* – This figure represents the base revenue allowance (weighted average cost of capital earned on regulated asset value, depreciation and costs paid in year as 'fast money') set by the Authority for each GDN in Final Proposals and includes any additional allowance provided for under the uncertainty mechanisms. It is updated through the Annual Iteration Process (AIP)[4] (see following bullet point) and adjusted for inflation. In Final Proposals, we set out the components of base revenue and the role of the AIP.
- *MOD* – This is the adjustment in a formula year to the Distribution Network's Opening Base Revenue Allowance, derived in accordance with the AIP. This year, the MOD

[4] AIP 2015 Price Control Financial Model (PCFM). The 2014-15 values for MOD can be found in the "live results" worksheet in the recorded MOD section. The total MOD value has been uplifted by an RPIF factor (1.205) to convert from 2009-10 to 2014-15 prices.

value represents a reduction to the base revenue allowance of £16 million across the industry. The MOD includes adjustment for the totex incentive mechanism, which shares with customers the penalties and benefits if GDNs out-/under-perform their totex allowances. If a GDN outperforms its totex, around 64% is retained by the company and a percentage is returned to the customer through reduced future revenue. The sharing is symmetrical if the GDNs underperform. The amount returned to the customer is subject to a tax adjustment. Totex performance is discussed in chapter five. It should be noted that for a number of items in MOD, and also a number of other revenue allowances items outside of MOD, there is a two-year lag between performance and that performance being reflected in allowances. For example, the outperformance against totex achieved in 2014-15 will be reflected in MOD affecting allowed revenues in 2016-17. This is because it takes two years for the out-/under-performance to be identified and reported and for allowances to be subsequently adjusted for this performance.

- *Pass-through costs* – These costs are outside the GDNs' control and can be passed on to the customer – for example business rates, pension deficit, licence fees, NTS exit capacity charges and wholesale cost of gas. Because these are uncertain, we forecast the likely cost at the start of the price control and make adjustments annually. This is explained in chapter five.

- *Incentive adjustments* – In 2014-15, these were revenues earned through the Network Innovation Allowance (NIA) and the Discretionary Reward Scheme (DRS)[5]. Revenues from these two incentives amounted to £16.1 million in 2014-15 (and £10.3 million in 2013-14). There is further information on NIA in chapter four and on DRS in chapter three. Other incentive adjustments include: NTS exit capacity incentive; broad measure of customer satisfaction incentive; environmental emissions incentive; and shrinkage incentive. These incentives will affect revenue only from 2015-16 onwards due to the two-year revenue lag mentioned above, which forms part of the allowance mechanism.

- *Correction factor* – This is the revenue adjustment for under-/over-recovery of charges versus allowed revenue. In RIIO-GD1, the adjustment for the current year's over- or under-recovery will be recovered two years in arrears.

Allowed revenue compared to actual revenue

2.4. Table 2.2 shows the GDNs' maximum allowed revenues, actual revenues and the resulting over- or under-recovery for 2014-15. Over- or under-recovery of revenue can arise as charges are set in advance when there are uncertainties outside the GDNs' control, for example the price of gas and uncertain peak day demand. Where over- or under- recovery occurs it is corrected for by the correction factor (as described above).

[5] DRS revenue earned in respect of the licensees' performance in formula years 2011-12 and 2012-13.

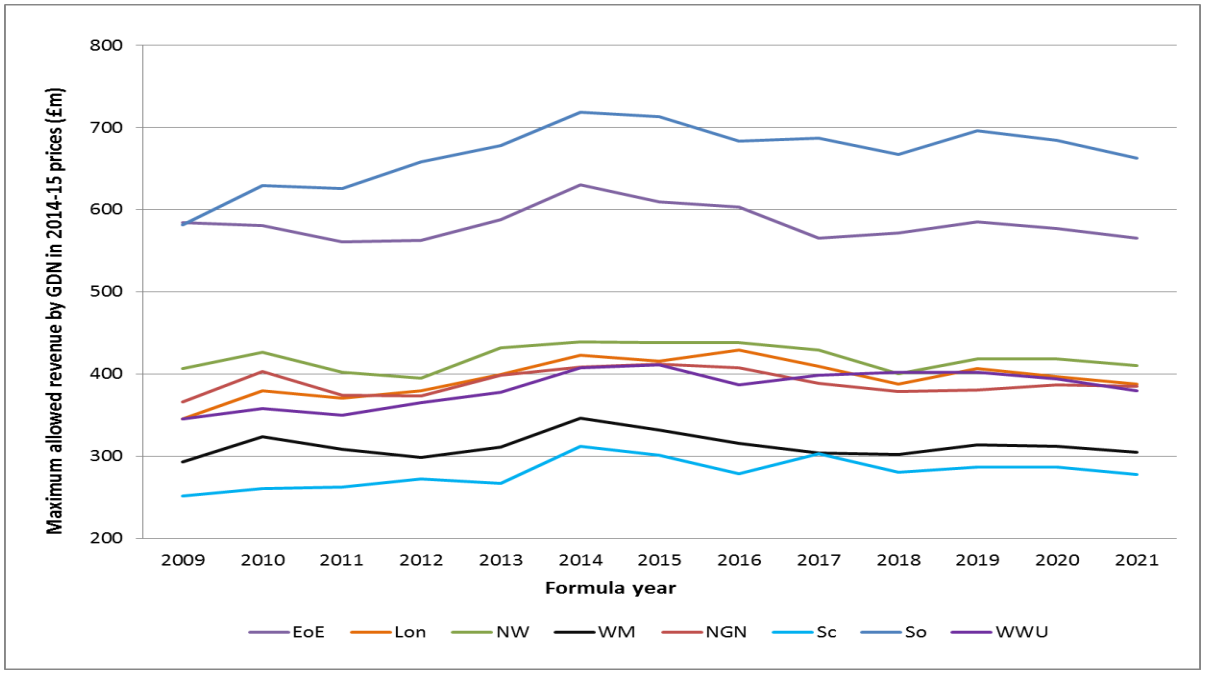
Table 2.2: Comparison of actual revenue against allowed revenue for 2014-15

Company	GDN	Actual Revenue	Maximum Allowed Revenue	Over/(under) Recovery	
		£m	£m	£m	%
NGG	EoE	609.5	609.2	0.3	0.0%
	Lon	416.8	415.6	1.3	0.3%
	NW	434.8	437.9	(3.1)	(0.7%)
	WM	332.3	331.7	0.6	0.2%
NGN	NGN	409.5	412.1	(2.6)	(0.6%)
SGN	Sc	299.7	301.4	(1.7)	(0.6%)
	So	716.3	712.9	3.3	0.5%
WWU	WWU	411.3	411.2	0.1	0.0%
Industry		**3630.3**	**3632.1**	**(1.8)**	**(0.9%)**

Movement in revenue over the price control period

2.5. Figure 2.1 shows the trends in actual maximum allowed revenue over GDPCR1 (the previous price control) and the first two years of RIIO-GD1 by GDN, and the forecast values for the remaining six years of RIIO-GD1.

Figure 2.1: Maximum allowed revenue[6] (£m) profile for 2008-09 to 2020-21

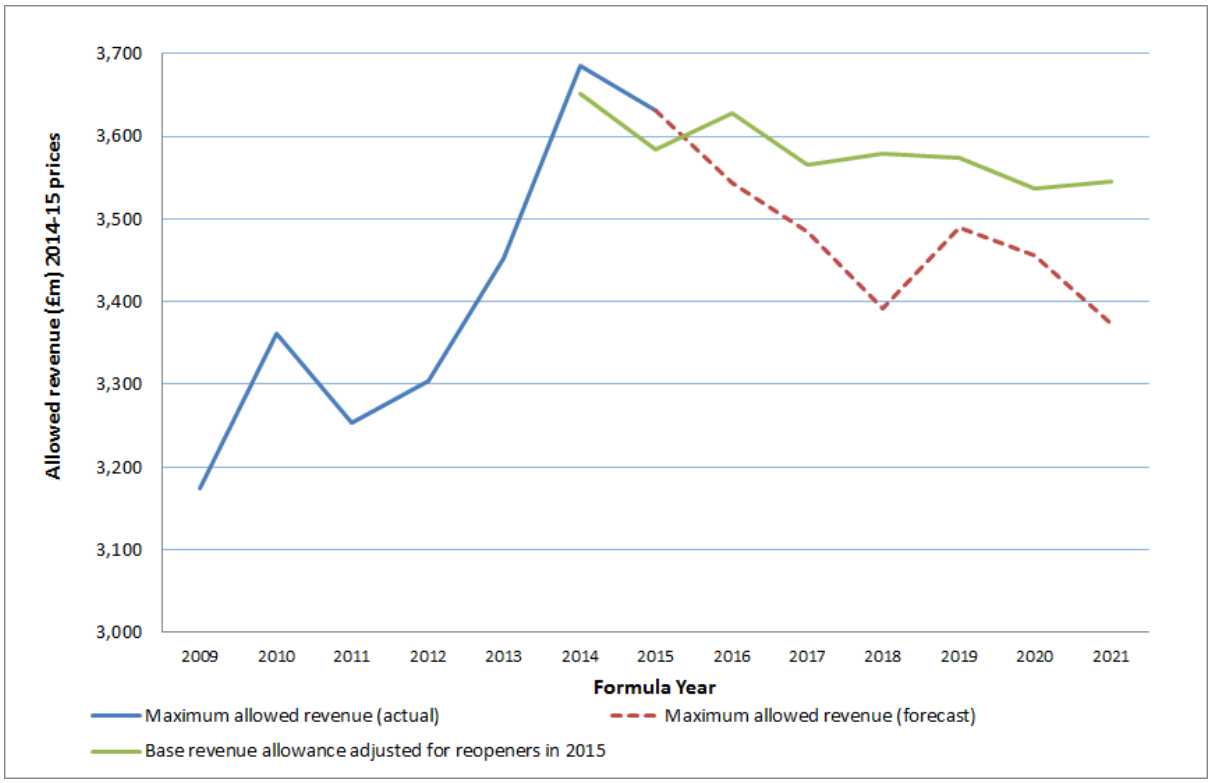


2.6. Figure 2.2 shows actual and forecast maximum allowed revenues, at an industry level, as well as the base revenue allowances as at Final Proposals (adjusted for reopener decisions made in 2015 for all years of RIIO), represented by the green line. Base revenues can differ from maximum allowed revenues, as they do not include adjustments for items such as output incentives and changes in pass-through costs. At Final Proposals, base revenue allowances were forecast to be broadly flat over the RIIO-GD1 period. However, maximum allowed revenues, derived from the GDNs' latest revenue return submissions and MOD 186 reports, are showing an aggregate reduction from £3,685.5 million in 2013-14 to £3,373.5 million in 2020-21 (in 2014-15 prices). This reflects a range of factors including improved cost efficiency by the networks (further details on the cost movements are set in chapter five), a lower cost of debt, a lower inflation rate, lower corporation tax rates and a lower gas price (which has reduced the shrinkage allowance[7]).

[6] Maximum allowed revenue figures for 2008-09 to 2014-15 are derived from the GDNs' revenue return submissions, whilst forecasts for 2015-16 to 2019-20 comprise forecasts as per the October 2015 published MOD 186 reports. The forecast revenue for 2020-21 can be found in the December 2015 published MOD 186 reports. From October 2012 onwards, National Transmission System (NTS) exit capacity costs were gradually phased in as an in-year pass-through cost increasing the revenue allowance, with GDNs recovering NTS exit capacity charges from shippers (prior to this National Grid NTS levied exit capacity charges directly on GDN shippers)..

[7] NGGD requested that we amend its Shrinkage Allowance to reflect the forecast price of gas between now and the end of the price control period which resulted in savings for gas customers in the years before the end of the price control rather than waiting for a true-up at the end of the period. Decision on amendments to the Shrinkage Allowance

Figure 2.2: Maximum allowed revenue and RIIO-GD1 base revenue (£m) at industry level from 2008-09 to 2020-21



Customer bill impact

2.7. The GDNs recover their charges for owning and operating the gas distribution networks through consumers' gas bills. Network costs are one element of the gas bill they receive from their energy supplier. In calculating the impact on bills of GDN allowed revenues, we assume that 100% of gas distribution transportation charges are passed on from suppliers to customers. The details of the (new) method we use to calculate bill impact, which we have worked on with the GDNs, are provided in Appendix 1. This new method uses GDN specific values, including for annual consumption and load factor.

2.8. This year, the gas distribution network costs for an average domestic customer were £130.49. This figure represents 11% of the average domestic dual fuel customer bill estimated at £1,190.[8] The gas distribution network costs for an average customer fell in 2014-15 by £3.25, from £133.74[9] in 2013-14, a reduction of just over 2%.

2.9. Over the duration of RIIO-GD1, we predict that the gas distribution element of an average domestic customer's bill will fall by £12.49: from £133.74 in 2013-14 to £121.25 in 2020-21.[10] In part, this reflects forecast totex efficiency, from 2017-18 to

[8] Data table- large suppliers: domestic dual fuel bill breakdown over time; last updated in 2014.
[9] Networks costs were reported as £141.02 in last year's RIIO GD1 Annual Report. The comparative value of £133.74 for 2013-14 is a revised value based on the new customer bill impact method explained in Appendix 1 of this report.
[10] This statement is based on calculations made using the most up-to-date forecast information, which might

2020-21. Other drivers of the customer bill impact calculation are explained in Appendix 1. The forecast element of distribution charges to an average domestic customer by GDN across RIIO-GD1 are shown in Table 2.3. These forecasts are uncertain for a number of reasons including that maximum allowed revenues, consumption levels and charging methodologies can all change. We will continue to monitor customer bill impact throughout RIIO-GD1.

Table 2.3: Forecast gas distribution element of an average domestic customer bill (2014-15 prices)

GDN	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
	£	£	£	£	£	£	£	£
EoE	125.57	121.33	120.91	112.35	113.96	115.38	112.76	111.00
Lon	145.63	141.55	149.36	141.69	133.77	139.48	134.76	132.42
NW	131.58	123.23	125.49	122.24	113.52	118.48	117.27	115.47
WM	130.46	129.13	123.90	119.25	118.23	121.75	120.07	117.88
NGN	128.38	131.25	132.83	125.24	122.11	121.40	122.44	122.74
Sc	132.49	133.41	123.21	132.34	122.06	124.20	123.51	122.82
So	146.61	140.37	135.97	135.76	130.91	135.26	131.11	129.65
WWU	126.12	124.93	119.15	120.52	123.87	123.40	122.29	120.02
Industry	**133.74**	**130.49**	**128.88**	**125.70**	**122.27**	**124.90**	**122.79**	**121.25**

change in next year's calculation. Values have been reported in 2014-15 prices and will be rebased to current prices each reporting year.

3. Outputs

Chapter Summary

This chapter examines GDNs' performance against their RIIO-GD1 output commitments in the second year, and their forecast future performance for the remaining years of the price control. Where GDNs' performance has failed or is forecast to fail, we explain the reasons and what is being done in response.

General

3.1. As part of RIIO-GD1, we set a range of outputs which the GDNs have committed to deliver during the price control period. Outputs form the cornerstone of the RIIO price control framework[11] and reflect the minimum that customers require of a GDN. Outputs fall into six categories:

- Network safety
- Network reliability
- Protection of the environment
- Social obligations
- New connections
- Customer service

3.2. Tables 3.1 and 3.2 summarise companies' achievements against these outputs. Some output commitments must be achieved each year of the price control, while others are to be achieved over the total eight-year RIIO-GD1 period. The two tables identify whether the 2014-15 annual commitments were met and whether the eight-year output commitments are forecast to be met.

3.3. The tables are colour-coded to indicate the level of success achieved in 2014-15 or forecast to be achieved over the RIIO-GD1 period:

- **Red** – companies have failed to achieve an annual output or we forecast that an eight-year output commitment will fail
- **Amber** – the eight-year output commitment is at risk of failing
- **Green** – companies have successfully achieved an annual output or are on-target to meet the eight-year output commitment
- **Grey** – a report is not included for this year while a review of the output is being completed.

3.4. Where companies do not meet their output commitments we will take appropriate action, as we have done with NGGD's failure to meet their repair risk target in three of their four networks.

[11] Further detail of the outputs framework in RIIO-GD1 is available on the Ofgem website at https://www.ofgem.gov.uk/ofgem-publications/48155/2riiogd1fpoutputsincentivesdec12.pdf.

Table 3.1: 2014-15 one-year outputs

Primary output	Deliverable	Incentives [1]	Unit	EoE	Lon	NW	WM	NGN	Sc	So	WWU
Connections	Guaranteed standards performance	n/a		✓	✓	✓	✓	✓	✓	✓	✓
Environmental	Shrinkage (leakage)	⇔	GWh	435	234	335	289	375	198	542	376
Safety (emergency response)	97% Controlled gas escapes	n/a	%	98.47%	97.73%	98.93%	98.29%	99.99%	99.59%	99.37%	99.60%
	97% Un-controlled gas escapes	n/a	%	97.60%	97.39%	98.20%	97.52%	99.85%	98.75%	98.50%	98.48%
Safety (management of repairs)	GS(M)R 12 hour escape repair requirement	n/a		✓	✓	✓	✓	✓	✓	✓	✓
	Management of repairs (Repair risk)	n/a		✓	✗	✗	✗	✓	✓	✓	✓
Safety (major accident hazard prevention)	GS(M)R safety case acceptance by HSE	n/a		✓	✓	✓	✓	✓	✓	✓	✓
	COMAH safety report reviewed by HSE	n/a		✓	✓	✓	✓	✓	✓	✓	✓
Customer service	Planned interruptions survey	⇔	scores out of 10	8.0	7.9	7.9	7.9	8.7	8.7	8.5	8.7
	Emergency response and repair survey	⇔		9.3	8.9	9.2	9.2	9.4	9.3	9.2	9.4
	Connections survey	⇔		7.7	6.5	8.3	7.9	9.0	8.4	8.3	9.0
	Complaints metric	⇩		9.9	11.4	10.1	9.9	2.7	8.8	9.6	6.9
	Stakeholder engagement	⇧		5.9				5.5	6.4		7.05

[1] **Incentive keys:** ⇧ = incentive reward only; ⇩ = incentive penalty only; ⇔ = incentive reward and penalty.

Table 3.2: Forecast eight-year outputs

Primary output	Deliverable	Incentives [1]	Unit	EoE	Lon	NW	WM	NGN	Sc	So	WWU
Connections	Introduce distributed gas entry standards	n/a	scmh connections	4,160	-	1,423	900	1,200	3,760	4,650	3,250
Social obligation	Fuel poor connections [2]	n/a	number	12,046	2,824	13,306	8,345	14,500	17,130	10,376	12,590
	Carbon monoxide awareness	n/a		✓	✓	✓	✓	✓	✓	✓	✓
Environmental	Shrinkage (leakage)	⇔	GWh	435	234	335	289	375	198	542	376
	Provide biomethane connections information	n/a		✓	✓	✓	✓	✓	✓	✓	✓
Reliability (loss of supply)	Duration of planned supply interruptions	n/a		This area is under review - refer to chapter 3 Outputs, "Reliability"							
	Duration of unplanned supply interruptions	n/a									
	Number of planned supply interruptions	n/a									
	Number of unplanned supply interruptions	n/a									
Reliability (network capacity)	Achieving 1 in 20 obligation [3]	⇔		✓	✓	✓	✓	✓	✓	✓	✓
Reliability(network reliability)	Maintaining operational performance	n/a		✓	✓	✓	✓	✓	✓		✓
Safety (mains replacement)	Iron mains risk reduction (based on MPRS)	n/a		✓	✓	✓	✓	✓	✓	✓	✓
	Sub-deducts networks off-risk	n/a		✓	✓	✓	✓	✓	✓	✓	✓

[1] **Incentive keys:** ⇧ = incentive reward only; ⇩ = incentive penalty only; ⇔ = incentive reward and penalty.

[2] The incentive at the end of RIIO-GD1 is dependent on any over/under delivery of the fuel poor connections commitment

[3] Achieving the 1 in 20 obligation is related to the provision of NTS exit capacity at the GDN's offtakes

Secondary deliverables relating to safety and reliability outputs are discussed in appendices 2 and 3.

Operating a safe network

3.5. There are five primary network safety outputs:

- iron mains risk reduction (mains replacement) – eight-year output
- emergency response – annual output
- management of repairs (repair risk)– annual output
- major accident hazard prevention – annual output
- sub-deduct networks off-risk – eight-year output.

Iron mains risk reduction

3.6. The gas distribution network consists of 72,000 km of iron mains, representing 27% of the total mains population. The remainder is constructed mainly from polyethylene and steel. Iron mains are known to fail in service and can potentially cause major incidents (fires and explosions) which can injure or kill people, or damage property. The companies are therefore required by the Health and Safety Executive (HSE) to carry out a programme of iron mains replacement.

3.7. The HSE updated its iron mains policy to coincide with the start of the RIIO-GD1 price control period in 2013. Their new policy means GDNs can develop their replacement programme with fewer constraints than before. It also allows for risk to be controlled on larger diameter pipes by alternatives to conventional full replacement if the relative costs and total benefits of a full replacement do not justify the work. This has allowed GDNs to identify innovative ways to replace iron mains, which has contributed to GDNs outperforming their totex allowances. Further information on the three-tier policy can be found in Appendix 4.

3.8. The established iron mains risk measurement tool, Mains Replacement Prioritisation System (MRPS),[12] assesses whether companies have met this output. Companies produced an inventory of the risk of each pipe at the beginning of the price control period, and the total risk reduction is determined against this inventory as the iron mains are individually decommissioned or the risk specifically controlled.

3.9. The second year of RIIO-GD1 has seen the industry remove 80% more iron mains risk than would be required on a straight line basis to achieve the eight-year output. However, there were significant variations between GDNs. Table 3.3 shows the iron mains risk reduction for each GDN reported in 2014-15 and for the two years of RIIO-GD1. In 2014-15, London removed 12% less iron mains risk, while Scotland removed 231% more iron mains risk than would be required to achieve the eight-year target. All companies explained in their annual reports that they were targeting the higher-risk mains as a way to achieve this primary output early. As a consequence, across Great Britain, the iron mains risk has reduced by 0.22 incidents per year because of this iron mains risk removal policy work.

[12] MPRS is a model used for assessing the risk of an incident caused by individual iron mains.

Table 3.3: Iron mains risk reduction 2014-15

Company	GDN	Risk reduction 8 year commitment	Proportionate annual risk reduction for one year	Actual risk reduction achieved		Risk removal outperformance	
				2015	2-year total	2015	2-year total
		Incidents/year x 10^6					
NGGD	EoE	192,567	24,071	35,559	79,356	48%	65%
	Lon	102,281	12,785	11,305	26,362	-12%	3%
	NW	154,428	19,304	34,232	70,338	77%	82%
	WM	131,394	16,424	17,904	38,633	9%	18%
NGN	NGN	111,191	13,899	17,904	61,023	29%	120%
SGN	Sc	44,277	5,535	18,300	35,324	231%	219%
	So	137,287	17,161	35,751	80,152	108%	134%
WWU	WWU	98,727	12,341	24,061	49,032	95%	99%

3.10. Most[13] GDNs have taken the decision to target the smaller diameter Tier 1 iron mains,[14] which tend to have a higher risk score. This has led to the larger diameter iron mains, which are traditionally more expensive, being forecast for replacement in the later years of RIIO-GD1. This focus has also contributed to the financial outperformance of the GDNs. Although all GDNs are on target to remove the required level of risk-associated mains, they also have an obligation to take off-risk an HSE-required length of iron mains over the eight-year control period. The relative performance of the GDNs is shown in Table A2.1 in Appendix 2.

3.11. The abandonment workload for iron mains in Tiers 2 and 3, the larger diameter pipes, again was significantly lower than expected for all GDNs, with two of NGGD's networks, Northern and Wales and West, abandoning less in the second year than they did in the first year of RIIO-GD1. However, there are no annual outputs that the GDNs must achieve, and the GDNs stated that they are committed to meeting the target over the eight years. The GDNs anticipate that permitted, innovative techniques will be developed to manage the risk for these larger diameter iron mains as possible alternatives to full replacement. Further details of the iron mains secondary deliverable for mains off-risk can be found in Appendix 2.

3.12. When setting the price control, NGGD identified the replacement of some of its medium pressure Tier 2 & 3, mains in London as a significant issue. This was part of its London medium pressure (LMP) strategy to allow NGGD to manage risk by replacing high consequence mains in and around London. This strategy required a number of large complex engineering schemes to be completed, which would allow NGGD also to increase system pressures; however, to achieve the benefits, many of the schemes are dependent on each other. We set allowances based on an assumption that around 70km of mains would be replaced. NGGD forecasts that it will now replace only around 24km during RIIO-GD1. We are continuing to consider the price control implications of this proposed reduction in its LMP workload.

[13] NGN select projects for replacement based on cost benefit analysis using the wider range of factors available under the revised HSE approach.
[14] Tier 1 pipes are iron mains falling under the HSE iron mains risk reduction policy having a nominal internal diameter of up to eight inches. Tier 1 iron pipes represent approximately 95% of all the at-risk iron mains population, the remaining 5% are above eight inches in diameter.

Emergency response

3.13. Emergencies fall into one of two categories:

- Uncontrolled escapes (ie where the source of the leak cannot be confirmed as having been isolated by turning off an emergency control valve)
- Controlled escapes (ie if the source of the leak is confirmed as having been isolated by the closure of the emergency control valve).

3.14. GDNs have a licence requirement to attend at least 97% of uncontrolled escapes within one hour and controlled escapes within two hours from the time of the report of the gas escape being received. Table 3.4 shows that all GDNs met this standard. However, we note that all four of NGGD's GDNs' performance for attending controlled escapes deteriorated for the second year running.

Table 3.4: Percentage of gas emergencies attended within standard

GDN		Percentage of **uncontrolled** gas emergencies jobs to within the one hour standard		Percentage of **controlled** gas emergencies jobs to within the two hour standard	
		2014	**2015**	**2014**	**2015**
NGGD	EoE	97.91%	97.60%	98.99%	98.47%
	Lon	97.72%	97.39%	98.53%	97.73%
	NW	98.52%	98.20%	99.23%	98.93%
	WM	97.91%	97.52%	98.83%	98.29%
NGN	NGN	99.85%	99.85%	99.97%	99.99%
SGN	Sc	99.02%	98.75%	99.80%	99.59%
	So	98.52%	98.50%	99.51%	99.37%
WWU	WWU	98.33%	98.48%	99.49%	99.60%

Repair management

Proportion of gas escapes prevented within 12 hours

3.15. GDNs have an obligation under the Gas Safety (Management) Regulations 1996 (GS(M)R) to prevent reported gas escapes within a 12-hour period unless they can prove it is not reasonably practicable to do so. We expect companies to deliver the 12-hour standard as proposed in their business plans, while complying with statutory requirements.[15]

3.16. Table 3.5 shows that all GDNs met and outperformed their output commitment and all GDNs (with the exception of both SGN's GDNs) improved their performance compared to 2013-14 though both SGN networks have higher targets than the other

[15] The requirement to meet the 12 hour escape prevention standard is detailed in the GS(M)R Regulations 7(4) and 7(10), with further clarification in HSE's circular SPC/ENFORCEMENT/140.

GDNs. NGGD reported that the increased focus on this output had a detrimental impact on its repair risk performance (see below).

Table 3.5: Gas escapes prevented within 12 hours

Company	GDN	2013-14		2014-15	
		Target	Actual	Target	Actual
NGGD	EoE	42%	50%	42%	54%
	Lon	43%	44%	43%	48%
	NW	34%	45%	34%	48%
	WM	36%	43%	36%	50%
NGN	NGN	60%	62%	60%	63%
SGN	Sc	60%	73%	60%	69%
	So	60%	64%	60%	63%
WWU	WWU	40%	47%	40%	49%

Repair risk

3.17. Repair risk measures the safety risk presented by escapes which have been individually assessed as not warranting urgent emergency action. The escapes are monitored until it is reasonable and proportionate to carry out the necessary repair work. This enables the GDNs to risk assess escapes and factor in considerations such as labour and material availability and public impact of completing the repair.

3.18. Annual repair risk is the total risk score associated with all gas escapes which require repair, recorded on a daily basis and totalled over a year. The repair risk primary output measure is based on maintaining, as a minimum, the total actual risk for 2012-13.

3.19. Five networks (East of England, Northern, Scotland, Southern and Wales and West) met their required output, but the remaining NGGD networks (London, North West and West Midlands) fell short. It is the second year running that these three networks failed to meet their required output and their performance has deteriorated from 2013-14. Table 3.6 below shows performance by GDN.

Table 3.6: Repair risk performance[16]

Company	GDN	output requirement	2013-14		2014-15	
			Actual	Variance	Actual	Variance
NGGD	EoE	5.2	3.0	41.5%	5.0	3.3%
	Lon	4.6	4.9	(5.2%)	8.9	(93.6%)
	NW	4.9	5.3	(8.4%)	7.8	(58.2%)
	WM	2.5	3.0	(21.4%)	3.3	(33.0%)
NGN	NGN	34.5	34.4	0.4%	24.8	28.1%
SGN	Sc	2.5	1.9	23.3%	2.0	18.2%
	So	17.7	10.3	42.1%	10.0	43.3%
WWU	WWU	24.2	24.7	(2.0%)	18.6	23.0%

[16] The GDNs have different methodologies and the output requirements were set based on the methodology employed by the GDN

3.20. NGGD recognises that performance against this output has deteriorated across all four of its GDNs, with only East of England meeting the output. NGGD has put in place repair risk initiatives to ensure resources are allocated more effectively. It identified a number of causes of the failure:

- A focus on attending escapes quickly and resolving network escapes within 12 hours detracted from its focus on the network repair risk
- The use of technology such as 'key hole' excavation, which reduces disruption to the public, meant that some jobs were deferred until the required plant was available
- An increase in the number of Local Authority permit schemes resulting in jobs being scheduled around highway access.

3.21. We have reviewed the failure of NGGD to meet this output in three of its networks for the second year and following this a settlement figure of £3 million was agreed with NGGD to acknowledge their failure to meet this output. This £3 million will go to the fuel poverty charity National Energy Action (NEA) and will contribute to delivering activities that reduce fuel poverty. We will also be consulting on introducing a licence condition to ensure delivery of this output.

3.22. WWU failed to meet this target in the first year as a result of a single large uncontrollable event but, following increased management focus, it outperformed the target in the second year.

Major accident hazard prevention

3.23. The major accident hazard prevention output requires companies to prepare their safety case as required by GS(M)R[17] for approval by the HSE, and to submit a safety report for approval by the HSE in accordance with Control of Major Accident Hazards Regulations 2015. All companies have complied with this obligation.

Sub-deduct networks off-risk

3.24. A sub-deduct network has an unusual configuration consisting of a primary meter and one or more secondary meters. The ownership of such networks is sometimes unclear, presenting a safety issue.

3.25. Companies have primary output commitments to remove the safety risk associated with these networks. They can do this by either identifying a third party that formally accepts full responsibility for them, or carrying out physical alterations to remove the uncertainty of ownership.

3.26. The GDNs continue to remove the risk where it is less complex to resolve, and are planning their strategy for the remainder. NGGD plans to resolve all the outstanding sub-deduct networks in two of its networks by the end of 2016 and in its other two networks in 2017. All companies have forecast to achieve this output by removing the risk associated with these networks by the end of the price control period as shown in

[17] Regulations 3 and 4 of the GS(M)R require the companies to have up-to-date safety cases that explain how they ensure the safe conveyance of gas, accepted by the Health and Safety Executive.

Table 3.7. All networks have been successful in finding alternative ways to remove the risks associated with sub-deduct networks without the need for physical works resulting in a significant financial outperformance.

Table 3.7: cumulative % off sub-deduct networks taken off risk[18]

GDN	2014	2015	2016	2017	2018	2019	2020	2021
EoE	50%	78%	103%	103%	103%	103%	103%	103%
Lon	52%	75%	100%	100%	100%	100%	100%	100%
NW	44%	54%	77%	100%	100%	100%	100%	100%
WM	42%	54%	77%	100%	100%	100%	100%	100%
NGN	7%	65%	86%	91%	95%	100%	100%	100%
Sc	35%	52%	98%	100%	100%	100%	100%	100%
So	41%	71%	95%	100%	100%	100%	100%	100%
WWU	8%	10%	70%	90%	100%	0%	0%	0%

Secondary deliverables

3.27. Improved safety risk can be confirmed through secondary deliverables of mains safety. These are:

- length of mains off risk (km)
- numbers of pipe fractures and corrosion failures from iron mains
- number of occurrences of 'gas in buildings' events caused by iron mains
- number of incidents[19]
- number of steel service pipes decommissioned.

3.28. Secondary deliverables for safety are discussed in Appendix 2 - Safety Secondary Deliverables.

Reliability – operating a reliable network

3.29. Consumers need a reliable and continuous gas supply, and output commitments require companies to achieve minimum levels of network reliability performance. Network availability to GB consumers in 2014-15 was 99.997%, consistent with the distribution network's performance in the previous year.

3.30. There are three primary outputs relating to network reliability:

- Loss of supply (duration and number of planned and unplanned interruptions) – eight-year output
- Achieving the 1-in-20 supply capacity obligation – annual output
- Maintaining operational performance – eight-year output.

[18] Since the start of RIIO-GD1 a number of additional sub-deduct networks have been identified and as a result the table can show that over 100% of the sub-deduct networks have been taken off risk
[19] Incidents are defined as major structural damage, injury or loss of life.

Minimising planned and unplanned supply interruptions

3.31. Measures for this output are in the categories:

- Planned supply interruptions
  - Number of interruptions
  - Duration of interruptions

- Unplanned supply interruptions
  - Number of interruptions
  - Duration of interruptions

Review of the reliability output

3.32. Concerns have been raised that some of the interruptions targets (both planned and unplanned) may be unachievable based on GDNs first two years performance. This may have been due to errors when setting the targets. We also consider that some of the targets may not be challenging enough. We are therefore reviewing this output.

3.33. We want to ensure that this output drives the right behaviour and consider the current output may not do this as companies strive to meet it. For example, the current interruptions target could influence companies when planning mains replacement and scheduling work. Sometimes it is in the interest of the customer to delay work to a more convenient time for the customer rather than to carry it out as quickly as possible, which could lead to shorter interruption durations but greater inconvenience for the customer.

3.34. We are reviewing the output targets and intend to consult on this in Spring/Summer 2016. Any change may include modifying the licence and/or improving guaranteed standards of performance. We have asked the companies to provide us with updated forecasts, with supporting evidence, for the remainder of RIIO-GD1.

Summary of interruptions performance

3.35. To understand how GDNs are performing so far, based on the current targets, on this eight-year output, we compare performance against a linear interpolation of the overall output level for the first two years, based on the assumption that any eight-year output is delivered evenly each year. Only networks which failed to meet the linear annual output commitment or are at risk of failing the eight year output are summarised in table A5.5 in Appendix 5.

3.36. There is also a detailed performance assessment in Appendix 5: Planned and Unplanned Interruptions Performance. There is further explanation of GDNs' performance below.

3.37. In the first year NGGD were unable to submit data on their interruptions performance due to a system reporting error. This is now resolved.

Planned interruptions

3.38. The number of planned interruptions depends on the level of mains replacement workload and the number of services replaced or transferred. Planned interruptions often allow work to take place which improves safety and reliability for consumers. The mains replacement programme is a large contributor to planned interruptions.

3.39. WWU have accelerated their Tier 1 mains replacement programme which has impacted number and duration of planned interruptions. They are continuing to increase the use of 'live insertion' to reduce planned interruption duration and number and are still forecasting to meet the eight year output.

3.40. Northern and Southern have also carried out more mains replacement in the first two years of RIIO than originally forecast, and other GDNs (East of England, London, Southern and Wales and West) have replaced more services than anticipated. This has led to more planned interruptions.

3.41. We anticipate the number and duration of planned interruptions to increase in North West and West Midlands as they have carried out less mains replacement work than was intended in 2014-15, but plan to increase workload in 2015-16.

3.42. NGGD have chosen to carry out more mains replacement towards the end of RIIO-GD1. This is to allow further innovation to be implemented and potentially cause less disruption and fewer interruptions to consumers. Whether companies are successful in causing less disruption to consumers through innovation will be shown in the planned work customer satisfaction survey.

3.43. Northern explained that the number of planned interruptions in 2014-15 was due to an increase in Tier 1 mains replacement. But service replacement was lower than the allowance because of projects being developed in areas where the services had previously been replaced. Northern acknowledged that a higher number of service replacements could have led to more planned interruptions than the average allowance for the first two years of RIIO-GD1. It plans to increase the use of 'live insertion' to reduce the number of interruptions and the impact of planned work on consumers.

Unplanned interruptions

3.44. Performance for unplanned interruptions depends on the emergency response to network failures, damage to network assets, capacity-related network failures and upstream gas supply failures. Companies have some influence over the performance of unplanned interruptions. As the mains replacement programme progresses, we expect to see the number of unplanned interruptions reduce.

3.45. Northern is forecasting to not meet its commitment for number of unplanned interruptions in RIIO-GD1. Its explanation for this is an increase in the number of leaking services being reported. It believes this is down to an increase in Emergency Control Value faults which lead to interruptions.

3.46. SGN has indicated that it will be unable to meet the RIIO commitment for unplanned interruptions in both its Scotland and Southern networks. The data submitted for unplanned interruptions in its business plan was based on leaking services only, meaning interruptions based on current reporting criteria were underestimated. This will be investigated in the review of the interruptions output.

3.47. Wales and West had a large increase in unplanned interruption duration in 2014-15 due to third party action, caused by the Nantyglo burst water main incident. This took the number of unplanned interruptions for 2014-15 above the linear annual commitment.

3.48. NGGD told us that unplanned interruptions in London, East of England and West Midlands took longer because of interruptions in multi-occupancy buildings (MOBs) increasing in these GDNs. When there are failures on MOBs, gas supplies can be isolated for long periods while a repair is planned. This means more and longer interruptions.

NGGD is investigating innovative riser technologies to manage unplanned interruptions in MOBs. SGN already has a policy to manage interruptions affecting MOBs.

3.49. NGGD is carrying out a survey programme on MOBs during RIIO-GD1 to identify risk levels and create a replacement programme.

Achieving the one-in-20 supply capacity obligation

3.50. Under companies' licence conditions, GDNs are required to maintain supplies for the daily demand conditions that are statistically experienced in the worst winter in 20 years. This ensures companies will safely and securely distribute gas to consumers through their networks even when demand for gas is high.

3.51. The capacity of above-ground assets may change as a result of wholesale or part replacement of an installation. We set the primary output to ensure any work carried out on these assets increases or maintains the overall capacity, and capacity does not gradually erode in pursuing lower-cost, short-term solutions. The output compares the capacity capability of above-ground installation sites with the demand required under a one-in-20 winter condition.

3.52. Tables 3.8 and 3.9 show the profile of the number of above-ground installations that fall within various capacity bands at the start of RIIO-GD1 and after the second year.[20] Sites listed in the >100% category will require a special management plan to ensure supplies are maintained under one-in-20 conditions, whereas sites in the other percentage categories are able to provide the required capacity without special measures.

3.53. Similar capacity tables will be used to monitor trends in capacity availability against the profiles set as outputs for the mid-period (31 March 2017) and end of RIIO-GD1. We will work with the companies to determine a suitable and consistent methodology to assess their performance.

Table 3.8: Position at start of RIIO-GD1 (number of installations)

	EoE	Lon	NW	WM	NGGD	NGN	Sc	So	WWU
</= 50%	No individual GDN commitments for NGGD				182	54	96	88	167
>50% to </=70%					142	55	29	49	97
>70% to </=80%					81	29	5	15	30
>80% to </=100%					164	40	14	11	52
>100%					41	13	3	0	0
Total no. of sites					**610**	**191**	**147**	**163**	**346**

[20] The GDNs are required to maintain sufficient capacity to meet a 1 in 20 peak day demand requirement. Their NTS offtake capacity is set as the lower of GDNs" forecasts or constant offtake volumes. The GDNs NTS offtake volumes is updated to reflect their latest capacity bookings

Table 3.9: Position at end of 2014-15 (number of installations)

	EoE	***Lon***	***NW***	***WM***	**NGGD**	**NGN**	**Sc**	**So**	**WWU**
</= 50%	*82*	*31*	*50*	*43*	206	59	88	118	164
>50% to </=70%	*92*	*19*	*37*	*34*	182	56	32	28	80
>70% to </=80%	*47*	*16*	*13*	*19*	95	27	7	10	39
>80% to </=100%	*45*	*8*	*21*	*21*	95	44	15	8	51
>100%	*11*	*9*	*7*	*7*	34	9	6	0	0
Total no. of sites	***277***	***83***	***128***	***124***	**612**	**195**	**148**	**164**	**334**

Maintaining operational performance

3.54. Maintaining operational performance is measured through six secondary deliverables:

- Number and value of offtake meter errors - annual commitment
- Duration of telemetry faults - annual commitment
- Pressure systems safety regulations (PSSR) fault rate - annual commitment
- Gas holder demolition – eight-year commitment
- Maintenance of network records - annual commitment
- Health, criticality and risk metrics – eight-year commitment

3.55. Achievement of each of these deliverables confirms that the network is operating within agreed criteria; each must be met to achieve the overall primary output. We will review this at the end of the price control period, but we monitor the secondary deliverables annually and will take action if we have any material concerns in respect of delivery of these commitments.

3.56. Appendix 3 provides information on performance in each of these areas by GDN. The main deficiencies in the second year relate to the duration of telemetry faults:

- NGGD identified a reporting error in its 2013-14 submissions that resulted in the understatement of the telemetered faults. This error has now been corrected but as can be seen in Table A3.1 NGGD overall met the target.

- Southern exceeded the maximum duration of telemetered faults for the second year but showed significant improvement from the previous year from being 122% above threshold in 2014 to 30% above the threshold in 2015. SGN have confirmed that they are now meeting this target and forecasting to deliver this output for the remainder of RIIO-GD1.

Customer service

3.57. Most consumers rarely need to communicate with their GDN. When they do need to, it is essential that they receive a good standard of customer service and that questions are dealt with promptly and professionally. We also encourage companies to engage with their stakeholders effectively, and to reflect stakeholders' views in the planning and operation of their business.

Broad measure of customer service

3.58. A 'broad measure of customer service' is used in RIIO-GD1 to incentivise GDNs to deliver good customer service and engage with stakeholders. GDNs can earn financial rewards or penalties based on how well they perform. The incentive has three components:

- Customer satisfaction survey
- Complaints metric
- Stakeholder engagement

3.59. While companies are performing well, we consider to maintain and improve their performance will still require significant focus by the companies.

Customer satisfaction survey

3.60. The customer satisfaction survey monitors performance within three customer categories:

- **Planned interruptions:** Customers who have been affected by planned work carried out by the GDN on service pipes which is likely to have caused an interruption to their gas supply

- **Emergency response and repair:** Consumers who report a gas escape or loss of supply

- **Connections:** Customers who have had work completed on a new or existing gas connection

3.61. This incentive is symmetrical. GDNs can be rewarded or penalised a sum of up to 0.5% of base revenue, depending on how well they perform against the target.[21] The customer satisfaction scores and incentive gained for 2014-15 are shown in table 3.10. The average customer satisfaction scores for RIIO-GD1 so far are shown in table 3.11.

[21] The target is based on the GDN upper quartile performance during the trial customer satisfaction survey that took place prior to RIIO GD1.

Table 3.10: GDN customer satisfaction survey data 2014-15[22]

Company	GDN	Score out of 10					Ranking of average score(2014-15)	Financial Reward/ (Penalty) (£m)			
		Planned interruption	Emergency response and repair	Connection	Average (2014-15)	Average (2013-14)		Planned interruption	Emergency Response and Repair	Connection	Total financial Reward/ (Penalty)
NGGD	EoE	8.03	9.29	7.73	8.35	8.31	6	(0.10)	1.03	(0.43)	0.51
	Lon	7.91	8.87	6.55	7.78	7.79	8	(0.22)	0.23	(0.70)	(0.69)
	NW	7.89	9.20	8.30	8.46	8.31	5	(0.26)	0.74	0.54	1.02
	WM	7.86	9.15	7.95	8.32	8.18	7	(0.22)	0.56	(0.07)	0.27
NGN	NGN	8.65	9.38	9.01	9.01	8.75	2	0.70	0.70	0.70	2.09
SGN	Sc	8.75	9.25	8.37	8.79	8.72	3	0.51	0.51	0.47	1.49
	So	8.48	9.18	8.26	8.64	8.56	4	1.15	1.21	0.75	3.10
WWU	WWU	8.68	9.44	9.01	9.04	8.69	1	0.70	0.70	0.70	2.09
Target		**8.09**	**8.81**	**8.04**			Total reward/ penalty	**2.26**	**5.67**	**1.95**	**9.89**

Table 3.11: GDN customer satisfaction survey data – two-year cumulative

Company	GDN	Score out of 10				Ranking of average score
		Planned interruption	Emergency response and repair	Connection	Average	
NGGD	EoE	8.10	9.24	7.66	8.33	6
	Lon	7.91	8.86	6.58	7.78	8
	NW	7.78	9.21	8.17	8.39	5
	WM	7.91	9.10	7.73	8.25	7
NGN	NGN	8.52	9.32	8.81	8.88	1
SGN	Sc	8.71	9.23	8.33	8.76	3
	So	8.46	9.11	8.24	8.60	4
WWU	WWU	8.64	9.29	8.67	8.87	2
Target		**8.09**	**8.81**	**8.04**		

[22] The survey asks customers about the service provided and they are asked to score the GDN out of 10. Only the answer to the final question (overall, how satisfied were you with the service provided) is used to measure performance for the purpose of this incentive.

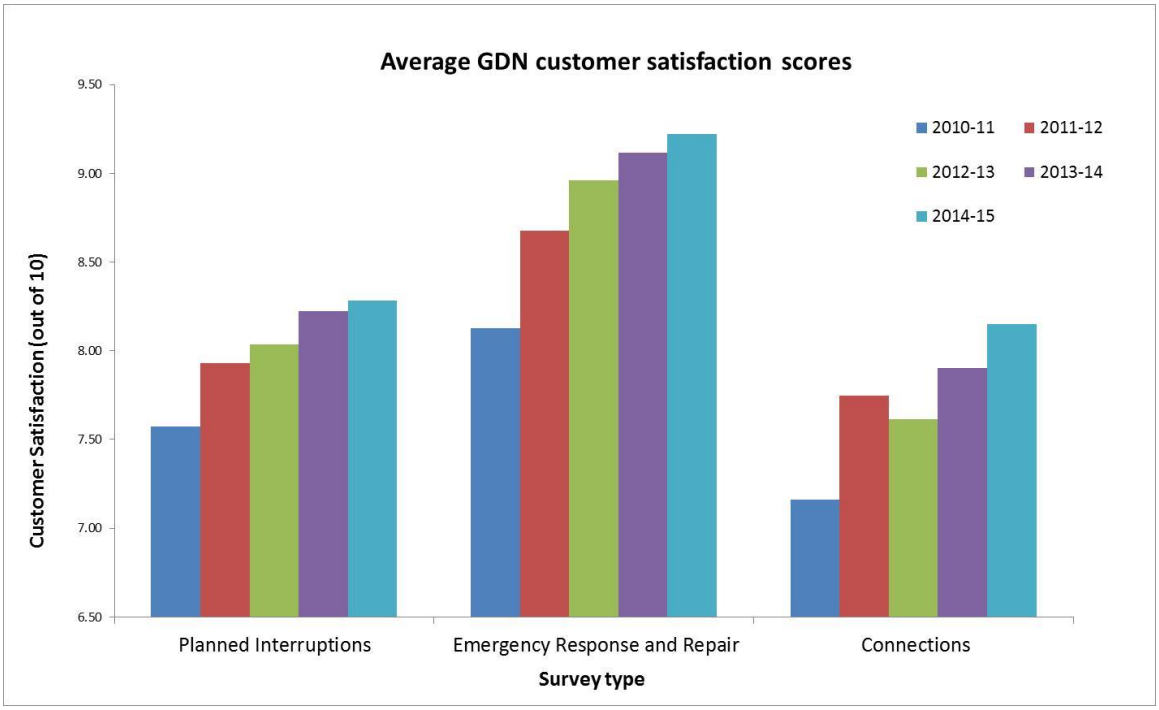
3.62. It can be seen that all four of NGGD's GDNs failed to meet the required target score for the planned interruptions surveys in 2014-15, and three of the four NGGD GDNs failed to achieve the required target score for connection surveys. This is the second year that three GDNs have failed to meet the target score for planned interruptions and connections. They were penalised £1.7 million for their performance in these areas.

3.63. Wales and West achieved the highest average score across the three survey categories in 2014-15, while the four NGGD GDNs achieved the lowest for the second year running. Northern maintains the highest average score across all surveys for RIIO-GD1.

3.64. Despite NGGD failing to meet target scores, overall industry performance has improved on previous years. Figure 3.1 shows the level of improvement since 2010-11.

3.65. Northern, Scotland, Southern and Wales and West are performing well and outperforming their targets.

Figure 3.1: Average GDN customer satisfaction survey scores from 2011 to 2015.[23]



3.66. Some of NGGD's GDNs did not achieve the minimum number of connection surveys necessary to inform the incentive. This is the second year that NGGD has been unable to meet the required number of surveys. Wales and West also failed to meet the minimum number of surveys for emergency response and repair surveys. We will be working with the GDNs to determine if the type of survey used (paper survey) is still suitable. If we think this is restricting the number of surveys completed we will look to update how surveys can be collected to ensure the method is future proof and appropriate for all consumers to provide the most accurate overview of customer

[23] The customer satisfaction survey incentive commenced at the start of RIIO-GD1. In 2010-11 customer satisfaction scores were calculated on a slightly different basis to subsequent years.

satisfaction. We would seek to ensure any change to the customer survey is incentive neutral.

Customer complaints

3.67. The complaints output incentivises GDNs to resolve complaints quickly and effectively. Complaints performance is measured against four indicators based on the percentage of:

- complaints resolved in one day
- complaints resolved in 31 days
- repeat complaints, and
- Energy Ombudsman (EO) decisions against the GDN.

3.68. This incentive is asymmetric. Performance in each of these categories is combined to derive an overall score. The lower the score, the more effective the GDN is at resolving complaints. Where companies do not meet the target, they can be penalised up to 0.5% of base revenue.

Table 3.12: GDN number of complaints for 2014-15

Company	GDN	Unresolved at day +1 (%)	Unresolved at day +31 (%)	Repeat complaint (%)	Energy ombudsman decision against GDN (%)	Complaint metric score 2014-15	Complaint metric score 2013-14	2014-15 Ranking	RIIO- GD1 ranking
NGGD	EoE	79	6	0	0	9.90	10.41	6	5
	Lon	83	10	0	0	11.45	11.45	8	8
	NW	78	7	1	0	10.08	10.30	7	6
	WM	80	6	0	0	9.88	10.70	5	7
NGN	NGN	19	1	1	0	2.66	4.99	1	1
SGN	Sc	72	5	0	0	8.81	9.04	3	3
	So	79	5	1	0	9.63	10.15	4	4
WWU	WWU	52	5	0	0	6.93	7.38	2	2
Industry average		68	5	1	0	8.67	9.30		
Target						11.57			

3.69. As can be seen from table 3.12 all GDNs performed better than the target,[24] therefore avoiding a financial penalty. The industry average has improved since last year, as have all GDNs except NGGD's London network which has remained static. The average percentage of complaints unresolved at 31 days has reduced from nearly 20% prior to RIIO-GD1, to 5% during 2014-15. The industry average for percentage of complaints unresolved at day +1 has reduced from 74% in 2013-14 to 68% in 2014-15, with Northern making the biggest improvement. Northern and Wales and West are performing the best in RIIO-GD1 on this measure so far.

Stakeholder engagement

3.70. The stakeholder engagement incentive incentivises GDNs to engage with stakeholders to inform their business decisions. This incentive is asymmetric and GDNs can be rewarded up to 0.5% of base revenue where they meet the minimum standard. Where companies do not demonstrate improvements on previous year's stakeholder engagement they can expect to receive a lower score and therefore a reduced reward.

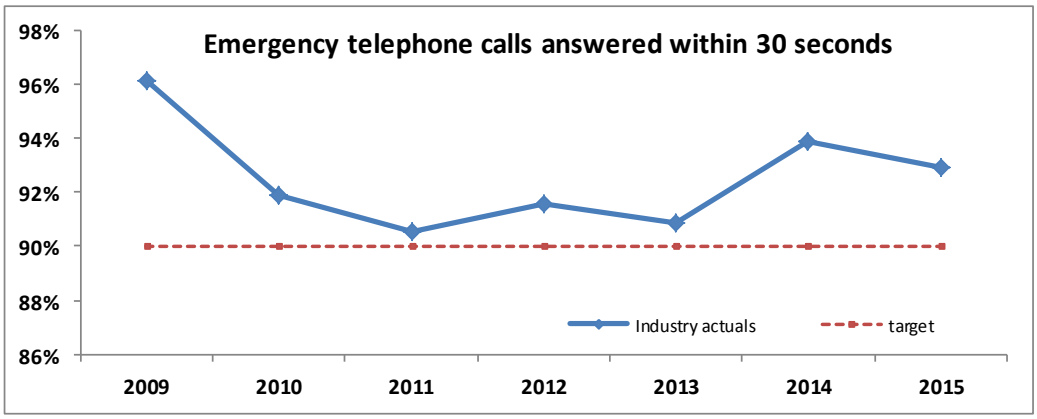
[24] There are a number of ways in which a score of 11.57 can be achieved. For example, a company that has 51% of complaints outstanding after one day, 20% of complaints outstanding after 30 days, 1% repeat complaints and 0% of total complaints being found against the GDN by the EO.

3.71. To be eligible for a reward, the company has to meet certain minimum criteria.[25] Performance under this incentive is then assessed by an independent panel on a company basis. The panel comprises acknowledged experts in communications and stakeholder engagement.[26] The scores and financial rewards are outlined in Table 3.13. A detailed report can be found on our website.[27]

Emergency telephone service

3.72. All GDNs have an obligation to maintain a continuously manned telephone service. This is operated by NGGD on behalf of all the GDNs but it is the responsibility of all the GDNs. Standard Special Condition D10 "Quality of Service Standards"[28] requires that 90% of calls to a GDN's emergency telephone line are answered by a person adequately trained to process such calls within 30 seconds. Whilst there was a reduction in the response time for answering emergency calls, performance remained above the average of the last price control as shown in figure 3.1.

Figure 3.1: Emergency telephone calls



[25]The minimum criteria are outlined in the Stakeholder Engagement Incentive Guidance Document; https://www.ofgem.gov.uk/ofgem-publications/87495/gdseincentive-guidancedoc.pdf

[26] Details of the panel members can be found at: https://www.ofgem.gov.uk/publications-and-updates/stakeholder-engagement-panel-members-2014-15

[27] The decision on the Stakeholder Engagement Incentive 2014-15: Gas Distribution can be found at: https://www.ofgem.gov.uk/publications-and-updates/decision-stakeholder-engagement-incentive-2014-15-gas-distribution

[28] Standard Special Condition D10, paragraph (2)(f) imposes obligations in relation to responding to telephone calls.

Table 3.13: GDN stakeholder engagement results

Company	GDN	Minimum criteria	Panel score (out of 10) 2014-15	Panel score (out of 10) 2013-14	Reward (£m) 2014-15	Reward (£m) 2013-14
NGGD	EoE	√	5.9	7.15	1.16	1.97
	Lon	√			0.8	1.32
	NW	√			0.83	1.43
	WM	√			0.63	1.05
NGN	NGN	√	5.5	6.75	0.61	1.11
SGN	Sc	√	6.4	6.05	0.72	0.62
	So	√			1.71	1.49
WWU	WWU	√	7.05	6.3	1.25	0.94

3.73. The panel acknowledged the progress made by the GDNs, with Wales and West scoring highest. All companies are performing well and NGGD and Northern Gas scored lower than previous year but continued innovation and development leads to upwards movement in scores as demonstrated by WWU and SGN's scores this year.

Connections

3.74. New connections to the gas distribution networks, which enable new customers to be supplied with gas and enable gas to enter the network from alternative sources. Gas entering the network from alternative sources is known as distributed gas, for example from a biomethane plant.

3.75. Customers contribute towards the cost of connecting a new supply, either in part or in full. New consumers will then pay a transportation charge as part of their gas bill.

3.76. There is no target for the number of new connections but GDNs have to meet guaranteed standards in terms of time taken to connect. There are also customer service standards for connections (discussed above), obligations on fuel poor connections (under social objectives) and objectives around facilitating biomethane connections (under environmental objectives below).

New gas connections

3.77. In the second year of RIIO-GD1 the GDNs made just under 60,000 new gas connections. Of these, approximately 20% were for new housing, 45% were to existing housing, 4% were non-domestic and 21% were fuel poor connections as part of the GDNs' social obligation output. All GDNs provide a connection service that meets the needs of customers.[29] NGGD's stated strategy is different to the other GDNs in that they encourage competition in connection services whether that is from Utility Infrastructure Providers (UIPs) or Independent Gas Transporters (iGTs) though they continue to provide a connection service that meets the needs of customers who either do not wish

[29] Standard Special Condition D13 – Provision of services for specific domestic customer groups. GDNs have a licence condition to provide services for specific customers which includes vulnerable domestic customers.

to exercise choice or where there is a failure by market participants to provide a service. The iGTs and UIP provide a connection service in all GDNs and are in addition to the connections made by the GDNs. Table 3.14 provides a GDN breakdown by type of connection.

Table 3.14: Breakdown of new gas connections activity by GDN 2014-15

Company	GDN	New Housing	Existing Housing	Fuel Poor			Non-domestic	Total
				One-offs	Community Schemes	Other scheme types		
NGGD	EoE	2,746	4,206	994	311	0	135	8,392
	Lon	936	1,450	229	0	0	170	2,785
	NW	739	1,742	1,247	464	0	80	4,272
	WM	787	1,396	515	434	0	87	3,219
NGN	NGN	2,257	2,504	982	725	0	398	6,866
SGN	Sc	848	4,725	1,620	2,079	50	361	9,683
	So	5,787	5,442	736	472	0	612	13,049
WWU	WWU	3,595	5,508	975	686	0	530	11,294
Industry		**17,695**	**26,973**	**7,298**	**5,171**	**50**	**2,373**	**59,560**

Guaranteed standards of performance

3.78. Customers seeking a new connection rely upon the companies to provide a good service. Guaranteed standards of performance relate to the timely delivery of connections services. GDNs have a licence condition to meet the standards on at least 90% of occasions. They all achieved this in 2014-15.

3.79. On occasions when GDNs fail to meet the required standard, for a particular customer they must make a payment to the affected customer. The GDNs paid over £409,000 to customers during 2014-15 for not meeting guaranteed standards of performance for connections, and of this NGGD paid £284,000, 70% of the total payments. A summary of GDNs' performance against the guaranteed standards and the compensation paid is shown in Appendix 6.

Social Obligations

3.80. Given the essential nature of gas and electricity, we expect network operators to play their part in supporting vulnerable customers and delivering against social obligations, which are primary outputs.

Fuel Poor Network Extension Scheme

3.81. Ensuring fuel poor households can access affordable energy supplies remains a key energy policy priority. The Fuel Poor Network Extension Scheme (the Scheme) helps fuel poor households to switch to natural gas by offering funding towards the cost of connecting to the network. This scheme should provide these households with access to a potentially less expensive form of heating.

3.82. We concluded our review of the Fuel Poor Network Extension Scheme[30] in September 2015 with the GDNs committing to an increase in fuel poor volumes from around 77,000 to over 91,000, an overall increase of 18%, ranging from 6% in NGGD to 37% in SGN. The GDNs were given additional allowances of £18 million to fund the additional fuel poor connections. So far, the GDNs have connected 27,283 fuel poor households, around 30% of their revised eight-year commitment, slightly higher than the linear two-year target. Additional changes are that District Heating is now covered by the Scheme and that partner approvals have an additional eligibility criterion for assessment. The changes to Scheme are effective from 1 April 2016.

3.1. We continue to expect the GDNs to work collaboratively with various organisations including suppliers and IGTs to provide the best outcome for the vulnerable consumers.

Table 3.15: Fuel poor connections – actual and RIIO-GD1 forecast

Number of fuel poor connections	2 year cumulative			RIIO-GD1 8 year		
	Commitment	Actual	% variance	Revised commitment [1]	Forecast	% variance
EoE	2,320	2,930	*20.8%*	12,046	12,046	*0.0%*
Lon	680	499	*(36.3%)*	2,880	2,824	*(2.0%)*
NW	3,340	3,496	*4.5%*	13,330	13,306	*(0.2%)*
WM	2,080	2,079	*(0.0%)*	8,360	8,345	*(0.2%)*
NGN	3,000	2,871	*(4.5%)*	14,500	14,500	*0.0%*
Sc	3,100	8,732	*64.5%*	17,130	17,130	*0.0%*
So	1,970	2,383	*17.3%*	10,367	10,376	*0.1%*
WWU	3,000	4,293	*30.1%*	12,590	12,590	*0.0%*
Industry	**19,490**	**27,283**	***28.6%***	**91,203**	**91,117**	***(0.1%)***

[1] *the original price control volumes for fuel poor were increased as part of the Fuel Poor Network Extension Scheme published in September 2015, with the exception of Lon, NW and WM*

Gas Discretionary Reward Scheme

3.2. The aim of the Gas Discretionary Reward Scheme (DRS) is to encourage gas distribution network operators (GDNs) to undertake activities to help address a range of social or environmental issues.

3.3. The incentive is designed to reward exceptional outcomes achieved by the GDNs that can be regarded as best practice and replicated across the industry. It recognises leading performance within the industry and aims to drive innovation. It is not intended as a means to fund GDN activities.

3.4. Under the RIIO-GD1 price control, the total reward available to the GDNs under this reward scheme is £12 million. We will be awarding this in three tranches of £4 million (with assessment taking place every three years). This is the first year of the scheme under the RIIO-GD1 price control and assessed performance in 2013-2015.

[30] Fuel Poor Network Extension Scheme Review final decision document

3.5. To be eligible for a reward, the company has to demonstrate that it meets the minimum requirements. Only those GDNs that pass our internal assessment of minimum requirements are forwarded to the Gas DRS expert panel. The allocation of the reward is based on the Panel's assessment of the GDNs' submissions. A detailed report on this year's Gas DRS can be found on our website.[31]

3.6. Table 3.16 outlines the financial rewards for this scheme, which will be added to their revenue for the year and will be recovered through customer bills in 2017-18 (two-year lag). The initiatives the GDNs were rewarded for are summarised in table 3.17.

Table 3.16: Rewards allocated for 2013-2015 Gas DRS

DRS category	NGGD	NGN	SGN	WWU	Total reward for each category
Social outputs	£0.15m	£0.20m	£0.20m	£0.20m	£0.75m
Environmental outputs	£0.15m	£0.30m	£0.20m	£0.40m	£1.05m
Carbon monoxide outputs	£0.15m	£0.20m	£0.20m	£0.30m	£0.85m
Collaborative work	£0.10m	£0.10m	£0.10m	£0.10m	£0.40m
Total awarded	**£0.55m**	**£0.80m**	**£0.70m**	**£1.00m**	**£3.05m**

[31] Decision on RIIO-GD1 Gas Discretionary Reward Scheme 2013-15.

Table 3.17: Gas DRS Initiatives

DRS category	NGGD	NGN	SGN	WWU
Social outputs	for its work with the Children's Society and NEA on the research study in Tamworth, and partnership work with Leicester City Council.	for its work with the Children's Society and NEA on the research study in Tamworth, and partnership work with Leicester City Council.	for its work on locking cooker valves for vulnerable customers and for its dementia awareness training.	for its leadership on the mapping of off gas grid properties and its 'whole house' approach to delivering a solution for vulnerable community in Bridgend.
Environmental outputs	for its trials on the use of high pressure plastic pipe and for its established theft of gas team	for its 'Premier League contractors' initiative and its hydrogen work including the H21 project.	for its biomethane connections and virtual biomethane pipeline.	for its biomethane work and its approach to re-use treated sludge from gas holders.
Carbon monoxide outputs	for its partnership work with the fire service and for demonstrating good learning from experiences in the shopping centre initiative.	for its work with specific community groups to raise awareness of CO safety issues, and for developing the iCOP app further.	for its work with the charity 'Dying to Keep Warm' to develop a training programme for front line care workers.	for its range of initiatives to raise carbon monoxide awareness, including its collaboration with the arts, and its dedication and enthusiasm to deliver these initiatives.
Collaborative work	The GDNs presented a range of initiatives in the collaborative report including, establishing a process for the GDNs and IGTs to work together on fuel poor connections; developing the 'Ignite' project which aims to provide access to cheaper alternative forms of energy; and improving CO safety by developing a gas mapping tool showing where dangerous/at risk appliances have been found.			

3.7. The Panel provided some comments for all of the GDNs to consider for future submissions:

- It is important in the submissions to be clear on how initiatives are over and above any existing funding or regulatory requirements.
- The GDNs should continue to demonstrate how they are working collaboratively.
- When describing any activities or initiatives (in particular with stakeholders other than the GDNs) it is important to be clear on what your role was and what role any other parties played.
- It is important to show continuity in future RIIO-GD1 submissions and demonstrate how initiatives have developed since this year's scheme.

Carbon monoxide (CO) awareness

3.8. The GDNs have made extensive efforts to improve awareness of the dangers of CO and to reduce the CO risk of certain groups. It is clear that the GDNs are collaborating positively together to improve their initiatives further but we would like to see more quantitative information on the effects of these in next year's Regulatory Reporting Pack.

3.9. Northern carried out extensive and wide-ranging initiatives on carbon monoxide. It has completed the full rollout of over 1,200 hand held devices capable of detecting

both natural gas and CO to all emergency staff, enabling it to identify specific instances of CO dangers. It has also engaged extensively with the community via classrooms, customer briefings and partnerships with organisations including difficult to access vulnerable groups.

3.10. Wales and West distributed over 3,800 CO alarms in the year; it has given safety briefings to targeted vulnerable customers and its campaigns have demonstrated an increase of awareness of 35%. It has also been externally recognised for its CO awareness work in the community.

3.11. Scotland and Southern have contributed to a CO awareness campaign via social media and press releases and have focussed on educating pupils and students though a Community Action Programme . Both networks have continued to issue CO monitors to vulnerable customers and have raised customer awareness of CO dangers by 39%.

3.12. NGGD has increased the awareness of CO by 29% following its direct engagement with customers and is now beginning to focus on the more at risk customers.

Protection of the environment

3.13. These outputs fall into two categories:

- **Broad environmental** objectives to ensure that companies contribute to the delivery of wider environmental objectives, in particular through the facilitation of connections of renewable gas, and
- **Narrow environmental** objectives to ensure companies minimise the environmental impact of their own activities, for example minimising transport losses (shrinkage) and minimising their business carbon footprint.

Broad environmental objective

3.14. There are two aspects of the broad environmental objective:

- Introducing a voluntary standard of service for biomethane connections; and
- Reporting on the progress of connecting biomethane gas entry facilities.

Introducing a voluntary standard of service for biomethane connections

3.15. Biomethane is a renewably-sourced substitute for natural gas, which can be injected into the gas network bringing environmental benefits. It is derived mainly from domestic and agricultural waste products and from waste water treatment. Biomethane injection to the distribution network is a growing technology with an increasing number of enquiries and studies underway.

3.16. As part of the price control settlement, we encouraged companies to introduce voluntary connection standards for gas customers to connect into the gas distribution networks. This should better enable future connections. As part of their RIIO-GD1 commitments, the companies have agreed to introduce common voluntary connections standards for initial enquiries (15 working days) and capacity studies (30 working days).

3.17. We will take into account the extent to which GDNs have facilitated the connection of distributed gas, including efforts to develop voluntary standards, as part of our evaluation of the Discretionary Reward Scheme submissions.

3.18. All GDNs have adopted the voluntary standards, though we have seen some variation in the quality and accessibility of information provision to customers.

Reporting on the progress of connecting biomethane gas entry facilities

3.19. As part of the broad environmental output, companies report:

- the total capacity of biomethane enquiries and applications currently in progress but not yet connected, and
- the total capacity of biomethane connected.

3.20. These figures are shown in Table 3.17. There is no financial incentive associated with this, but we believe there is a reputational incentive in making clear to stakeholders which companies are being most successful in this space.

Table 3.17 - 2014-15 Capacity of biomethane studies and capacity of biomethane connected

Biomethane Connections		Enquiries	Connection Studies	Connections	Capacity of studies(scmh)	Capacity connected(scmh)
NGGD	EoE	239	44	6	33,287	4,160
	Lon	5	1	0	600	0
	NW	20	2	2	1,350	1,423
	WM	54	3	1	1,650	900
NGN	NGN	59	6	1	3,960	1,200
SGN	Sc	95	9	2	7,450	3,760
	So	78	13	6	6,767	4,650
WWU	WWU	68	17	4	16,200	3,250
All GDNs		618	95	22	71,264	19,343

3.21. We note particular success in the East of England, Southern and Wales and West networks and note the total biomethane capacity connected to all GDNs has seen a twelve-fold increase, from 1,640m^3/hour in 2013-14 to almost 20,000m^3/hour in 2014-15. We note particular success where water and waste treatment providers have been engaged.

Narrow environmental objectives

3.22. There are two incentives related to the narrow environmental objective:

- The Shrinkage Incentive, which aims to reduce the costs of gas purchased by the GDNs; and
- The Environmental Emissions Incentive (EEI), which incentivises GDNs to reduce leakage from their systems.

These incentives focus on the gas leaked from the network.

3.23. The Shrinkage Incentive looks at the financial impact of all gas purchased, while the Environmental Emissions Incentive looks at the environmental effects of unburnt natural gas lost through leakage. Some constituent parts of unburnt natural gas, such as methane, are powerful greenhouse gases.

Shrinkage

3.24. 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% of Great Britain's greenhouse gas emissions. Shrinkage comprises:

- leakage from pipelines (approximately 95%)
- theft from the GDN network (approximately 3%)
- own-use gas[32] (approximately 2%).

3.25. Companies are incentivised through the RIIO price control to reduce leakage from the network through the Environmental Emissions Incentive (EEI) and to purchase gas to cover this shrinkage in a cost-effective manner by purchasing at a lower price than allowed for revenue adjustment through the Shrinkage Incentive.

3.26. The EEI incentivises companies to help protect the environment by achieving a further reduction in environmental emissions above their leakage targets and rewards them with a financial value based on Department of Energy and Climate Change (DECC) non-traded carbon value. This year, GDNs achieved a combined additional reduction in environmental emissions in excess of a quarter of a million tonnes[33] of CO_2 equivalent (tCO_2e), attracting incentive revenue of £15.5 million through the EEI mechanism[34].

3.27. In 2014-15, the GDNs earned £3.6 million through the shrinkage incentive scheme by purchasing gas in a more cost-efficient manner, which also reduced costs to customers.

3.28. Table 3.18 shows that all GDNs outperformed their shrinkage and leakage output commitments and will receive incentive payments.

[32] 'Own use gas' refers to that used for operational purposes on the GDNs' network. This is predominantly for gas pre-heating at pressure reduction stations to protect outlet pipelines against the damaging effects of frost heave.
[33] This figure is based on the previous year's methodology for determining the potential global warming potential of the leaked natural gas. These figures will be updated when a reporting methodology is agreed by Ofgem and the GDNs.
34 It should be noted that there is a two-year lag between performance and that performance being reflected in allowances. For example, the performance achieved in 2013-14 will be reflected in allowed revenues in 2015-16.

Table 3.18 - Shrinkage[35] and leakage volumes in 2014-15

Company	GDN	Shrinkage			Leakage		
		RIIO-GD1 Commitment	Actual	Shrinkage Incentive Revenue	RIIO-GD1 Commitment	Actual	Environmental Emissions Incentive Revenue
		GWh	GWh	£m	GWh	GWh	£m
NGGD	EoE	515	465	0.6	482	435	2.8
	Lon	282	250	0.4	264	234	1.8
	NW	378	356	0.3	356	335	1.3
	WM	323	303	0.3	309	289	1.2
NGN	NGN	445	397	0.6	420	375	2.8
SGN	Sc	226	214	0.2	210	198	0.8
	So	622	571	0.7	589	542	2.9
WWU	WWU	429	395	0.5	403	376	1.9
Industry		**3,220**	**2,950**	**3.6**	**3,033**	**2,784**	**15.5**

3.29. All GDNs predict that they will outperform their leakage output commitment over RIIO-GD1.

3.30. Most system leakage is due to gas escaping from metallic mains, through poorly sealed joints and corroded mains. Replacing metallic mains with polyethylene (PE) pipe results in significant leakage reductions, as PE pipe is largely leak-free. We would therefore expect to see reductions in leakage from the replacement of the metallic mains as required under the mains replacement programme.

3.31. We also expect GDNs to adopt other techniques to further reduce leakage, such as actively monitoring and managing system pressure, which is a significant driver of gas leakage. Most GDNs managed their systems with reduced pressures when compared to the previous year.

Business carbon footprint

3.32. The GDN's reported business carbon footprint (BCF) for 2014-15 is summarised in Table 3.19. This includes a comparison with the previous year's results and shows the annual change in footprint in terms of tCO_2e and percentage reduction. We note some variance in the NGN BCF. WWU have stated that the increase in their emissions is largely due to acceleration of their Repex programme. We also note the reductions in the BCF across all NGGD GDNs. NGGD has stated that this is partly due to reduced business miles and lower Defra emission factors for the car mileage. For general energy consumption, a minor reduction was seen, with NGGD noting a correlation between consumption and seasonal temperatures.

[35] Shrinkage Incentive Revenue Footnote is linked to cost, not volume of gas

3.33. There is no financial incentive associated with this metric as it is new and reporting is evolving. However, we hope that interested stakeholders will use this information to apply pressure to the companies in this area.

Table 3.19 - Total annual business carbon footprint

Company	GDN	2014-15 BCF (Excluding shrinkage) (tCO2e)	2013-14 BCF (Excluding shrinkage) (tCO2e)	% Change	Change	**Rank**
NGGD	EoE	24,731	26,207	5.6%	(1,476)	4
	Lon	14,896	16,496	(9.7%)	(1,600)	3
	NW	16,248	19,633	(17.2%)	(3,385)	2
	WM	10,843	13,135	(17.4%)	(2,292)	1
NGN	NGN	25,542	21,740	17.5%	3,802	7
SGN	Sc	11,770	12,506	(5.9%)	(736)	6
	So	23,138	22,839	1.3%	299	8
WWU	WWU	18,719	17,323	8.1%	1,396	5
Industry		**145,887**	**149,879**	**3.6%**	**(3,992)**	

Other emissions and natural resource use

3.34. GDNs also reported on other environmental aspects which are set out in table 3.20. These include:

- Land remediation
- The quantity of virgin aggregate used
- The amount of spoil sent to landfill
- ISO 14001 major non-conformities

Land remediation

3.35. Land remediation includes the statutory remediation of sites relating to demolished gas holders and non-gas holder sites, as well as routine site monitoring and maintenance. Remediation of gas holder sites is the key activity in this area, which is under review as part of the general review of the sales/transfers of gas holder sites, to ensure costs are properly declared and accounted for.

Virgin aggregate use and spoil sent to landfill

3.36. As part of their RIIO commitments, GDNs were asked to submit expected volumes of aggregate extraction and spoil to landfill as part of their business plans. We also require GDNs to report annually their performance levels. Their performance over the first two years of the price control is set out in the summary of environmental measures table below. In total, the spoil sent to landfill by the GDNs declined by 112,321 tonnes in 2014/15 when compared to the previous period.

ISO 14001 compliance

3.37. All four companies are accredited against the ISO 14001 international standard for environmental management. The standard does not in itself specify performance criteria, but assures conformity with the companies' stated environmental policies. The accrediting body undertakes periodic surveillance audits to check companies' compliance against the requirements of the standard.

3.38. There were no reported major non-conformities against the standard.

Table 3.20: Summary of environmental measures

Table 3.20 Other emissions and natural resource use		Description	Units	EoE		Lon		NW		WM		NGN		Sc		So		WWU	
				2014/15	2013/14	2014/15	2013/14	2014/15	2013/14	2014/15	2013/14	2014/15	2013/14	2014/15	2013/14	2014/15	2013/14	2014/15	2013/14
Broad environmental measure	Biomethane	Biomethane enquiries	Number	239	179	5	7	20	38	54	47	59	65	95	32	78	93	68	69
		Biomethane connection studies	Number	44	18	1	-	2	6	3	5	6	9	9	2	13	14	17	15
		Capacity of Biomethane connection studies	m3/h	33,287	21,417	600	-	1,350	3,136	1,650	3,173	3,960	5,680	7,450	900	6,767	7,247	16,200	9,675
		Biomethane connections	Number	6	1	-	-	2	-	1	-	1	-	2	-	6	-	4	1
		Capacity of Biomethane connected	m3/h	4,160	600	-	-	1,423	-	900	-	1,200	-	3,760	-	4,650	-	3,250	500
	Unconventional sources of gas	Other unconventional sources of gas enquiries	Number	-	-	-	-	-	2	-	-	-	3	-	1	8	-	-	1
		Other unconventional sources of gas connection studies	Number	-	-	-	-	2	2	-	-	-	-	-	-	2	-	-	-
		Capacity of other unconventional sources of gas connection studies	m3/h	-	-	-	-	20,000	10,000	-	-	-	-	-	-	2,000	-	-	-
		Other unconventional sources of gas connections	Number	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Capacity of other unconventional sources of gas connected	m3/h	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Narrow environmental measures	Land remediation	Sites routinely monitored & maintained - statutory	Number	43	30	7	13	36	13	11	9	40	-	13	-	12	2	25	25
		Non-gasholder demolition sites - statutory remediation	Number	8	7	1	1	3	-	6	2	-	-	-	-	-	-	3	4
		Gasholder demolition sites - statutory remediation	Number	4	17	6	9	18	5	2	3	-	-	-	-	-	-	2	2
		Total sites (statutory remediation)	Number	55	54	14	23	57	18	19	14	40	-	13	-	12	2	30	31
		Total cost	£m	1.66	6.2	2.14	2.97	11.23	0.3	0.08	1.2	0.55	0.01	0.57	0.41	0.98	0.05	2.38	1.25
	Virgin aggregate	Virgin aggregate (as a percentage of total imported backfill)	%	29.0	40.8	2.0	0.3	19.0	27.5	13.0	3.1	23.3	28.6	12.0	17.3	10.0	6.8	87.0	82.0
		Virgin aggregate	Tonnes	27,536	71,106	1,077	1,040	19,258	21,621	5,061	811	29,426	37,863	9,593	116,992	26,629	78,657	107,525	107,229
	Spoil to landfill	Spoil to landfill (as a percentage of total excavated spoil)	%	7.0	6.7	1.0	3.6	2.0	3.3	0.0	1.9	10.3	36.0	3.0	3.0	15.0	2.7	23.0	24.0
		Spoil to landfill	Tonnes	10,441	16,544	592	2,453	4,072	4,920	624	2,746	18,565	61,555	2,868	17,197	430	46,220	45,186	43,464
	ISO 1400	ISO 14001 major non-conformities	Number	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

4. Innovation

Chapter Summary

This chapter identifies how GDNs have been encouraged to identify innovation that aims to deliver a more efficient operation of their networks.

Network Innovation Competition

4.1. The gas network innovation competition (NIC) is an annual competition which encourages gas network licensees (distribution and transmission) to innovate in the design, build, development and operation of their networks.

4.2. The NIC provides funds to a small number of large-scale innovation projects. Network licensees compete against each other for up to £18 million of available funding each year. Trials financed through the NIC will generate learning for all network licensees and will be made available to all interested parties. This learning brings potential benefits and cost savings for current and future consumers.

4.3. In 2015, three gas distribution projects were awarded funding through the gas NIC:[36] two gas distribution projects received full funding, and one project for partial funding as summarised in table 4.1. A brief overview of each of the projects is also included in Table 4.1.

4.4. Partial funding was awarded to Northern, along with conditions that will need to be met before it can use any NIC funding. The conditions are to articulate better the learning objectives and deliverables relating to the novel charging arrangement and to change the figures in its submission to reflect the revised level of funding. In order to ensure that the project can progress and deliver valuable learning to other network companies.

[36] Gas Network Innovation Competition: 2015 funding decision

Table 4.1: 2015 Gas distribution NIC projects

Project Title	GDN	Brief explanation	Funding request	Funding awarded
Commercial BioSNG Demonstration Plant	NGGD	The Project will construct a commercial demonstration plant to produce renewable, low carbon methane (Bio-Synthetic Natural Gas by gasification of household waste. BioSNG could eventually meet 40% of UK domestic gas demand, resulting in customers being able to benefit from the continued use of the gas network into the future.	£5.4m	£5.4m
City CNG	NGN	City Compressed Natural Gas (CNG) - will build the UK's first scalable city-based CNG fuelling station for back to depot city based vehicles. It will use a novel charging arrangement to recover the costs of the high pressure connection over time, and provide a proof of concept business case to enable future private sector investment.	£1.1m	£0.7m
Real-time Networks	SGN	This project seeks to develop, install and demonstrate a flexible 'real-time' network that would enable the GB gas network to meet current and evolving needs. The project will install and demonstrate sensing technologies, associated hardware and software, and infrastructure in a representative section of the GB gas network.	£7.1m	£7.1m

Network Innovation Allowance

4.5. A network innovation allowance (NIA) was provided as part of the price control settlement to fund small scale innovative projects at companies' discretion. Companies are allowed to spend between 0.5% and 0.6% of allowed revenue each year.

4.6. In 2014-15, there were 181 active projects costing a total of £14.9 million. Appendix 7 summarises the projects.

4.7. These projects aim to find new ways of working which can lead to benefits for customers. As part of this year's regulatory reporting pack submissions, some of the companies provided examples of how some of these projects will impact their outputs, be incorporated into day to day operations, and ultimately impact customers.

4.8. NGGD stated that, in addition to some simple small solutions, like excavation templates that are being rolled out into the business, it is continuing to develop larger innovations such as Tier 1 Replacement System (TORS), Pipe

Replacement In-Situ Manufacturing (PRISM) and Cured In Place Pipe (CIPP). It is now confident that implementing new techniques from the TORS, PRISM and CIPP projects will reduce its repex (repair expenditure) forecast by a net £25 million for the RIIO-GD1 period. These benefits have been built in from 2017-18 onwards. Customers will benefit through not only a reduction in excavations, potential reductions in congestion and improved traffic flow, but also from the sharing mechanism during RIIO-GD1 and ongoing benefits of lower costs in RIIO-GD2.

4.9. SGN's CISBOT[37] project is an example of one of the current projects which has now progressed into implementation. This technology provides an alternative means of risk management for Tier 3 mains and SGN is implementing the technology in its network, repairing and remediating some of the highest risk pipes covering a distance of over 9km. The learning from the project has been disseminated to the other GDNs and SGN is working closely with them to help make CISBOT a viable option for joint repair and remediation.

4.10. In 2014, Northern brought together acoustic leak detection equipment with the existing Core & Vac minimal excavation technique. The result of trials using this technique has shown average repair time is down from 4 days to 4 hours and 95% of trial jobs delivered a cost saving of 12%. Northern's new innovations for 2014-15 include polyethylene riser lining projects. Northern is collaborating with NGGD and SGN to trial a process for different ways to repair pipes and how to test these repairs with a view to creating a definitive specification for the whole industry to use. It is estimated that using lining technology will save 25%-50% over the current replacement method, equating to approximately £3 million to £6 million for Northern alone over a five-year period. In addition to the financial benefit, this project spares the customer inconvenient disruptions and ultimately increases overall customer satisfaction.

4.11. Wales and West has estimated that its 22 NIA projects, many of which are in collaboration with other GDNs and SMEs, (13 of which started in the year) will deliver a benefit of reducing future expenditure by £250,000 per annum (eight projects have a safety benefit, 15 projects provide a reliable & sustainable gas supply benefit, six projects to help their drive for outstanding service and another eight deliver value for money for their customers). A significant proportion of WWU's innovation is linked to the understanding of the actual condition of iron mains including the inherent strain, thus potentially allowing evaluation of the likelihood of failure to a degree of accuracy never previously possible. This will allow for informed, targeted interventions potentially using new innovative techniques only where necessary, or otherwise extending asset life, thereby minimising both the cost and risk to the consumer.

[37] CISBOT – Cast Iron Joint Sealing Robot

5. Cost efficiency

Chapter Summary

This chapter looks at the GDNs' forecast expenditure over RIIO-GD1 compared with what was allowed in Final Proposals. It also explains how the price control deals with uncertainty.

Total expenditure

5.1. As part of RIIO-GD1, we set a total expenditure allowance (totex)[38] of £17.1 billion to enable companies to deliver their outputs and associated secondary deliverables. However, additional allowances of £140 million were given to the GDNs during 2015, £122 million for relevant costs under the uncertainty mechanism[39] and £18 million as part of the Fuel Poor Network Scheme review to fund an increase in fuel poor connections. Details on the additional allowances are discussed later in the chapter. Therefore, for the purposes of this report, performance will be measured against the adjusted allowances of £17.2 billion.

5.2. The companies are required to report their performance against the outputs and totex annually, and forecast their performance to the end of RIIO-GD1. After the second year, companies are forecasting they will outperform totex by £2.1 billion (12.5%) over the price control period.

5.3. Companies are incentivised to outperform their totex allowance as part of the totex incentive mechanism. Any outperformance is shared with the customer. For RIIO-GD1, around 64% is retained by the company, in addition to an allowance for the tax charge on the amount earned, and the remainder of any outperformance is returned to customers by means of a reduction in allowed revenue. Any underperformance (over-spend) against their allowed totex is similarly shared with the customer.

5.4. The companies' reported annual totex is used to determine future revenue with any out- or underperformance adjusted after a two-year lag. Any outperformance should ultimately have a positive impact on consumers' gas bills. However, this depends on the companies' customers, the gas shippers, passing this on.

5.5. Throughout RIIO-GD1, we will monitor the GDNs' actual totex and will compare this with the allowances set and companies' annual forecast. Companies will have to explain any variances as part of their annual reporting. When looking at the

[38] Totex is the companies' controllable costs, which exclude business rates, license fees, pensions contributions and shrinkage. The totex allowance has been adjusted to reflect the uncertainty of workload associated with Tier 2 above the threshold iron mains.

[39] At the time of setting allowed expenditure for RIIO-GD1, there was uncertainty around some costs and because of this, the price control[39] allows the GDNs to apply for relevant adjustments to their allowed expenditure by means of a reopener mechanism, in order to accommodate uncertain costs - Under Special Condition 3F, entitled 'Arrangements for the recovery of uncertain costs'.

companies' annual performance, it is essential to note the context that some outputs are to be delivered over the full eight-year price control period.

5.6. A fundamental change between the previous price control and the RIIO framework is that companies are free to deliver outputs based on total whole life costs without being limited to using either operating expenditure (opex) or capital expenditure (capex). This enables companies to select the best solutions and optimises costs and benefits, which is much more transparent during the second year of RIIO-GD1.

5.7. Companies' forecast costs also include an assessment of spending on activities that have not been funded as part of totex because of the uncertainty of the costs involved at the time of setting the price control allowances. However, under the uncertainty reopener mechanism,[40] additional allowances were given to NGGD and SGN (discussed later in the chapter).

RIIO-GD1 controllable totex trends and performance

5.8. The GDNs are forecasting an outperformance against adjusted allowances of £2.1 billion (12.5%) over the eight-year period. As part of our analysis, we have compared the companies' performance and forecast against the adjusted totex allowance. Table 5.1 shows variances for the current year, the two-year cumulative and the RIIO-GD1 forecast.

Table 5.1: Totex variances

	Adjusted Allowance[1]	**Actual**	**Variance**	
	£m	£m	£m	%
2014-15	2,153.2	1,870.0	(283.2)	*(13.2%)*
2 year cumulative	4,339.8	3,704.5	(635.3)	*(14.6%)*
RIIO-GD1 forecast	17,220.2	15,074.4	(2,145.9)	*(12.5%)*

[1] *Adjusted allowance - includes adjustment for Tier 2A and additional allowances for Physical Site Security, Streetworks and Fuel Poor*

5.9. The GDNs are incentivised to outperform their allowances, benefiting both the companies and their customers. Customers will receive a proportion of the £2.1 billion saving through the totex sharing mechanism. The second year performance has allowed us to better see the benefits of RIIO for both the consumer and the GDNs. The totex incentive and the longer eight-year price control period have driven different behaviour and encouraged the GDNs to deliver outputs more efficiently, although we are reviewing the outputs NGGD has failed or is forecasting to fail.

5.10. Table 5.2 sets out the allowed cost for each GDN with their actual costs and their forecasted expenditure for the RIIO-GD1 period.

[40] The price control allows for companies to apply for adjustments to allowed expenditure for specified uncertain costs under Special Condition 3F Arrangements for The Recovery of Uncertain Costs

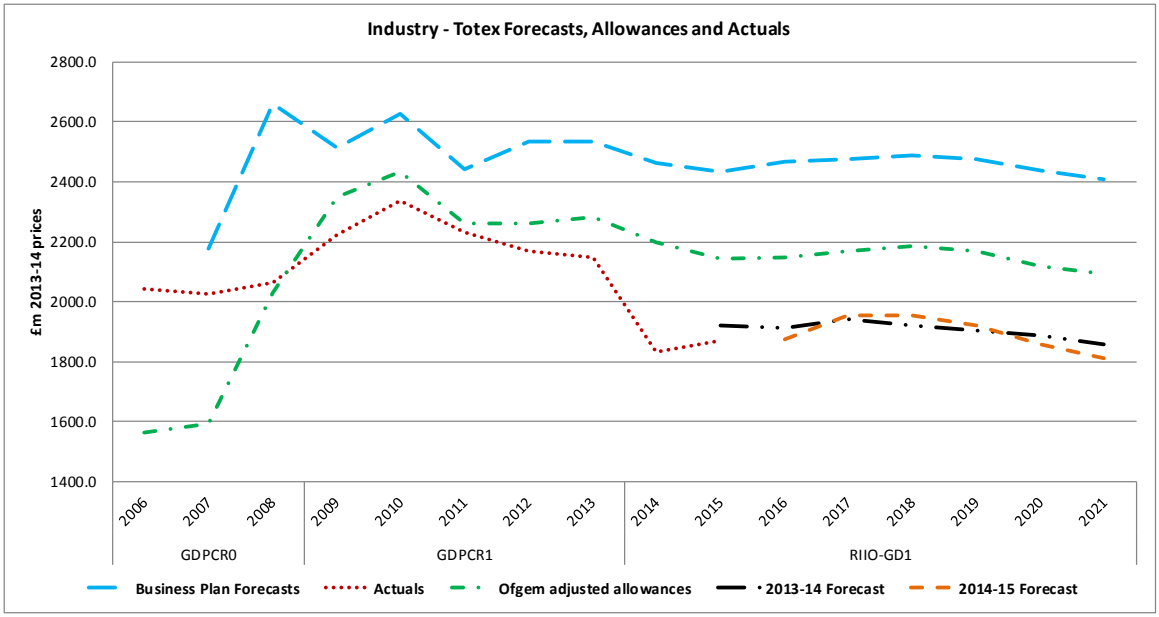
Table 5.2: GDN totex – allowed versus actuals/forecast (2014-15 prices)

GDN		2014-15 Year			2 year cumulative			RIIO-GD1 Forecast		
		Adjusted Allowance [1]	Actual	Variance	Adjusted Allowance [1]	Actual	Variance	Adjusted Allowance [1]	Actual	Variance
		£m	£m	%	£m	£m	%	£m	£m	%
NGGD	EoE	317.3	300.1	*(5.4%)*	647.3	605.6	*(6.4%)*	2,550.9	2,414.9	*(5.3%)*
	Lon	284.1	221.6	*(22.0%)*	563.0	462.4	*(17.9%)*	2,353.4	2,027.2	*(13.9%)*
	NW	245.5	254.8	*3.8%*	494.7	479.4	*(3.1%)*	1,916.6	1,799.6	*(6.1%)*
	WM	189.4	152.9	*(19.2%)*	378.8	317.0	*(16.3%)*	1,489.1	1,301.1	*(12.6%)*
NGN	NGN	255.3	227.2	*(11.0%)*	503.4	440.5	*(12.5%)*	1,995.1	1,702.8	*(14.6%)*
SGN	Sc	201.0	168.5	*(16.2%)*	408.1	315.0	*(22.8%)*	1,621.3	1,325.3	*(18.3%)*
	So	406.2	334.4	*(17.7%)*	829.6	653.4	*(21.2%)*	3,288.2	2,804.0	*(14.7%)*
WWU	WWU	254.4	210.4	*(17.3%)*	514.9	431.2	*(16.3%)*	2,005.8	1,699.5	*(15.3%)*
Industry		**2,153.2**	**1,870.0**	***(13.2%)***	**4,339.8**	**3,704.5**	***(14.6%)***	**17,220.2**	**15,074.4**	***(12.5%)***

[1] Adjusted allowance - includes adjustment for Tier 2A and additional allowances for Physical Site Security, Streetworks and Fuel Poor

5.11. Requested, allowed and actual expenditure is put into context by comparing them with historical levels. Figure 5.1 shows the increased investment at an industry level that was allowed and required following network sales in 2005 (individual GDN graphs are detailed in Appendix 8). Since 2011, totex has fallen and is forecast to remain stable throughout the remainder of the RIIO-GD1 period.

Figure 5.1: Industry controllable totex forecasts, adjusted allowances and actuals trends



5.12. The GDNs report the benefits of a totex expenditure compared to an opex or capex approach as was the focus in the last price control. The RIIO price control methodology is driving a culture of cost benefit assessment and the monetisation of risk. For example, GDNs have the ability under the totex methodology to increase

the amount of repair and maintenance work to achieve the same objective as carrying out full replacement such as refurbishing and upgrading of governors.[41]

5.13. The GDNs are currently working closely together to develop a common Network Output Measures methodology (NOMs) to meet the requirements of Special Condition 4G of their gas transporter licences. The NOMs methodology, once approved, will enable the monetisation of risk, facilitating cost benefit analysis and allowing the optimisation of risk reductions at least cost by taking a holistic approach to risk reduction by balancing opex and capex solutions. It will also allow Ofgem to take a clear view of whether companies have been properly monitoring the state of their networks which will be taken into account in closing out RIIO-GD1 and setting allowances for RIIO-GD2.

5.14. The GDNs also reported on the benefits of having a longer price control period, which has influenced the GDNs' business behaviour and allowed them to make longer term strategic decisions. The GDNs reported that several key areas contributing to their outperformance were made possible due to the longer eight-year period, for example contractor strategy and operating models, innovation and network design.

5.15. The GDNs reported that contractor strategy was a key area for cost reduction, both in terms of actual contract costs as well as other indirect savings impacting across many levels of the business. For example, NGGD moved from six to two contractors across its four GDNs. Other GDNs moved from using large single contractors to smaller / medium sized contractors, (as well as in-sourcing), allowing them to introduce different operating models to reduce overheads and support services such as reducing the numbers of depots, mobilisation and demobilisation costs.

5.16. The GDNs also reported that innovation has been key in driving down costs and allowing the companies to be more efficient and cost effective in how they carry out their work. For example, using core and vac technique to reduce the amount of excavation for repairs; using CISBOT[42] to reduce the number of excavations; trialling PRISM[43], which may reduce a the amount of excavation required and consequently reduce the time taken to complete the job, as well as on-site innovation/changes such as using 500m trailers, ductile iron cutters, drive to minimize hole sizes and number of evacuations.

5.17. In terms of network design, some of the GDNs reported that they are able to deliver and create larger projects and increase the use of live insertion.

---

[41] A governor is a device which automatically controls pressure or volume flow in the gas stream. The working life of a governor can be extended by refurbishment, replacing springs, diaphragms etc. This can provide a more cost effective solution to total replacement.

[42] Cast iron joint sealing robot: a robotic platform that can seal joints on larger diameter cast iron mains from the inside without having to excavate every joint

[43] Pipe replacement in situ manufacturing: a pipe-lining product which is hoped will minimise installation times and excavations in Tier 1 replacement work. It should be possible to create a new structural pipe (within an existing cast-iron pipe) with a life of up to 50 years, without the need to excavate and remove the existing cast iron pipe.

5.18. In addition, there are several other common general factors across the GDNs which contributed toward the outperformance such as a second mild winter, which reduced the adverse effects of cold weather on network assets. A second factor is the slower recovery of the economy, resulting in reduced workload and load-related expenditure and reduced the anticipated demand for new gas supply connections.

5.19. The GDNs reported that the slower than expected economic recovery, combined with other factors such as pressure management, has enabled them to meet their capacity obligations at lower than forecast capital expenditure. Load related expenditure, such as connections and mains reinforcement and governor replacement is at a lower level than initially envisaged due to the economic conditions and the ability of the networks to take a holistic approach to network design and to manage capacity constraints via other means including system pressure management. In our 2013-14 Annual Report, we also identified that GDNs have significantly benefited from lower increases in prices, for example labour and materials, than expected when we set the price control.

5.20. The increased flexibility inherent in the iron mains replacement programme has allowed the networks to change their workload mix and replace smaller diameter pipes than originally planned when setting the allowances and to defer work on many of the larger diameter and hence more costly iron mains replacements until later in the price control period. The GDNs are actively developing innovative techniques that will reduce the cost or eliminate the need to replace these larger diameter mains. Therefore, the average cost per km of mains replaced is lower than expected. GDNs are still achieving their risk score targets despite the change in workload mix.

5.21. As highlighted in chapter three, NGGD has changed its approach for the delivery of its London medium pressure (LMP) strategy. We are currently considering the financial and risk implications arising from this.

5.22. Other areas with reported savings are sub-deducts[44] and Xoserve.[45] The GDNs have reported £34 million below allowances for sub-deducts, mainly due to commercial solutions[46] being implemented rather than physical works being required to resolve the issue. The GDNs have also forecasted reduced spend in Xoserve of around £82 million. We are currently reviewing the funding and governance arrangements for Xoserve.

5.23. Costs associated with demolition (and associated statutory remediation) of former low pressure gas holders will continue to be monitored to ensure that any associated disposal of holder sites has the correct regulatory asset value (RAV) adjustment. NGGD reported £89 million of costs associated with holder demolition

[44] A sub-deduct network has an unusual configuration typically consisting of a primary meter and one or more secondary meters. As ownership of such networks is sometimes unclear they present safety issues which the GDNs are required to manage. The main way to manage these issues is either to clarify the ownership issues making it clear who has responsibility for the network or the physically reconfigure the network to remove the problem

[45] Xoserve delivers transportation transactional services on behalf of the gas network companies, and provides one service point for gas shippers.

[46] Commercial solutions are primarily around the development and implementation of formal agreements defining the ownership and responsibility for the sub-deduct network.

and associated statutory remediation over the last two years. SGN have reported £9 million in the current year only.[47]

5.24. The financial outperformance needs to be accompanied by delivering against the primary and secondary outputs. Where outputs have not been met or are at risk of not being met, we will consider the action we should take.

5.25. NGGD has highlighted to us that it has experienced contracting issues in their West Strategic Partnership leading to a lower than planned length of iron mains being replaced in the North West and West Midlands networks. NGGD has assured us that it has taken steps to ensure that associated outputs and secondary deliverables will be met.

5.26. We will continue to monitor the GDNs' totex performance throughout RIIO-GD1 and will consider their performance when setting future price controls.

Non-controllable pass through costs

5.27. In addition to the totex allowances described above, companies incur costs which are not directly within their control. We allow the companies to pass these costs through to revenue in the year in which they occur. Non-controllable costs are:

- Licence fees
- Network rates
- NTS exit charges
- The cost price of gas used to calculate the cost of shrinkage[48]
- NTS pension contributions

5.28. At the start of the price control, we assessed these as being £5 billion over the RIIO-GD1 period, but we make an annual adjustment to revenue to reflect the actual cost. Table 5.3 sets out allowed costs compared with updated actuals/forecasts.

Table 5.3: Non-controllable costs

	2014-15 Year				2 year cumulative				RIIO-GD1 Forecast			
	Allowance	Actual	Variance		Allowance	Actual	Variance		Allowance	Actual	Variance	
	£m	£m	£m	%	£m	£m	£m	%	£m	£m	£m	%
Total	**638.7**	**662.8**	**24.1**	***3.8%***	**1,276.9**	**1,320.7**	**43.8**	***3.4%***	**5,075.9**	**5,314.3**	**238.4**	***4.7%***
of which												
Licence fee/network rates/other[1]	311.7	379.9	68.2	*21.9%*	623.1	743.8	120.7	*19.4%*	2,493.6	2,988.1	494.5	*19.8%*
NTS exit costs	201.2	191.2	(10.0)	*(5.0%)*	400.9	374.7	(26.1)	*(6.5%)*	1,605.0	1,543.8	(61.2)	*(3.8%)*
Shrinkage	83.6	49.1	(34.5)	*(41.2%)*	168.7	117.7	(50.9)	*(30.2%)*	640.4	378.4	(262.0)	*(40.9%)*
Pensions	42.1	42.5	0.4	*1.0%*	84.2	84.4	0.2	*0.2%*	336.9	404.0	67.1	*19.9%*

[1] Costs split on average: Licence Fee 4%, Network business rates 92% and Other costs 4%

[47] The number of gas holders associated with these costs are: 100 for NGGD and 65 for SGN (these include gas holders that are mothballed, decommissioned, partly and fully decommissioned)
[48] The volume of gas lost through shrinkage is within companies' control and is therefore not subject to pass-through. This is explained in chapter three (Outputs).

Measuring companies' cost efficiency

5.29. The GDNs are monopoly businesses and it is not possible to introduce effective competition for most activities in the sector.[49] In the absence of natural competition, we benchmark companies' costs to establish efficient levels of expenditure. This enables us to identify the most efficient companies and helps us calculate future price control settlements. We also intend to develop and use benchmarking techniques to monitor companies' relative performance throughout the price control period.

5.30. In setting the price control for RIIO-GD1, we used combined top-down totex and bottom-up disaggregated approaches using the following drivers:

- modern equivalent asset value (MEAV)
- mains replacement workload
- connections workload
- the number of mains and services condition reports
- public reported escapes.

5.31. We do not consider it appropriate to use this approach to monitor performance through the price control in the future. It does not provide a fair reflection of efficiencies that can be achieved without the constraints of separate operating, capital and replacement expenditure performance. Performance under the RIIO model is essentially about the overall total expenditure incurred to deliver outputs rather than specific work activities. We will work with the GDNs to develop new benchmarking tools to include outputs and consider their effectiveness in order to better reflect the RIIO regulatory model.

5.32. Therefore, we have not published cost efficiency benchmarking results in this report for either totex or disaggregated cost categories.

Dealing with uncertainty

5.33. At the time of setting allowed expenditure for RIIO-GD1, there was uncertainty around some costs and because of this, the price control[50] allows the GDNs to apply for relevant adjustments to their allowed expenditure by means of a reopener mechanism, in order to accommodate uncertain costs such as connection charging boundary change costs, enhanced physical site security, large load connections, specified streetworks and smart metering roll-out costs. The GDNs may apply for relevant adjustments during two defined reopener windows, May 2015 and May 2018, with the exception of smart metering adjustments which may be applied for at any time.

5.34. During May 2015, several GDNs applied for adjustments to their allowed expenditure. NGGD and SGN applied for adjustments to enhanced physical site

[49] Independent Gas Transporters provide a connection service and own and operate local networks, such as new housing estates, which are connected to the eight GDNs.
[50] Under Special Condition 3F, entitled 'Arrangements for the recovery of uncertain costs'.

security and, in addition, NGGD applied for adjustments to specified streetworks. After our assessment and consultation, we allowed total efficient costs of £122 million against £160 million applied for. Table 5.4 sets out details of additional allowances allocated to GDNs.

5.35. We also completed the Fuel Poor Network scheme review in September 2015, which resulted in the companies committing to an increase to their fuel poor connection targets, from 77,450 to 91,203 (increased volumes ranging from 6% in NGGD to 37% in SGN), for which we allowed additional funding of £18 million.

Table 5.4 Additional allowances

Total Additional Allowances	Physical site security	Streetworks	Fuel poor	Total
GDNs	**£m**	**£m**	**£m**	**£m**
EoE	£32.3	-	£2.5	£34.8
Lon	£17.0	£12.7	-	£29.7
NW	£13.3	£8.1	-	£21.4
WM	-	-	-	£0.0
NGN	-	-	£3.2	£3.2
Sc	£13.5	-	£7.7	£21.2
So	£25.7	-	£1.9	£27.7
WWU	-	-	£2.2	£2.2
Total	**£101.8**	**£20.8**	**£17.6**	**£140.2**

5.36. In addition to reopeners, we are also carrying out a review into funding arrangements for Xoserve, which we aim to finalise in Autumn 2016.

5.37. NGGD has included forecast additional costs for smart metering where other GDNs have not highlighted any.[51] NGGD has indicated that it may apply for a smart metering reopener in autumn 2016.

5.38. In November 2015, we consulted on the need for a Mid-Period Review.[52] We said we have not yet identified any material issues for RIIO-GD1 and sought stakeholder feedback on our initial views. We will make our decision in April 2016.

Statutory Independent Undertakings

5.39. The Statutory Independent Undertakings (SIUs) are five remote independent gas networks[53]: four in Scotland and one in Wales. The four mainland Scottish SIUs (Wick, Thurso, Oban and Campbeltown) are currently supplied by Liquefied Natural Gas (LNG) transported via road tanker from Avonmouth near Bristol. Consumers within the mainland SIUs pay the average GB transportation charge. The additional cost of supplying LNG to the mainland SIUs is recovered through a charge levied by

[51] We allowed £6.2 million costs for smart metering set up costs across all GDNs
[52] Consultation on a potential RIIO-T1 and GD1 mid-period review
[53] There is an additional SIU on Stornoway which is supplied both by sea and road tankers transporting LPG and not natural gas/ LNG and is therefore not included.

National Grid Gas Transmission (NGGT) on all shippers and then passed on from NGGT to Scotia Gas Networks (SGN). In 2014-15, SGN reported that its expenditure on the SIUs was £11.8 million (opex) and £2.6 million (capex).

5.40. In setting RIIO-GD1, we included the option for a reopener for developing an enduring solution for the SIUs. SGN stated that it did not apply for a reopener in May 2015 as it is confident that the delivery of its enduring solution is expected to be within the current Totex allowances.

5.41. The Avonmouth facility is now due to close in May 2016 and, therefore, an alternative solution for supplying the SIUs needs to be established. SGN has been engaging with the HSE on the possibility of operating under an exemption to GS(M)R as they currently operate at Oban. SGN has said that, in order to secure consent from HSE it must undertake appliance testing and remediation at each of the SIUs. These costs were not envisaged under the original timeline but SGN expects that the solution of supplying LNG from continental Europe will be implemented within current allowances.

5.42. We expect SGN to include a clear plan for the implementation of a longer-term solution for the SIUs as part of its RIIO-GD2 business plan submission. This plan should analyse in detail other options for supplying energy to these locations including non-gas solutions, building on the work that it has done so far. The plan should also demonstrate that it has fully engaged with stakeholders on all potential options.

Gas Theft

5.43. Gas theft increases energy costs paid by consumers and can have serious safety consequences. We want GDNs to investigate theft where it is their responsibility to do so, and to pursue recovery of the value of any gas taken. GDNs have an obligation in their licence[54] to investigate cases of theft and, subject to the outcome of the investigation, use reasonable endeavours to recover the value of gas taken. The licence requires gas transporters to remain revenue-neutral in doing this and any surplus that results from investigations must be returned to consumers.

5.44. From this reporting year, we amended the gas theft reporting requirements for GDNs to gather more information on the theft investigations that the GDNs are undertaking.

5.45. In 2014-15, GDNs reported £0.2 million recovered as a consequence of successful theft investigations. NGGD and Northern have both been successful in recovering money and passing money back to consumers. SGN has stated in its reporting that it has recovered enough money to pass some back to consumers and we can expect SGN to request consent for returning this money. WWU has to date incurred costs through its theft of gas investigations, however has not as yet

[54] Gas Transporter Licence, Standard Condition 7, entitled 'Provision of Information relating to Gas Illegally Taken'.

reclaimed any money from these activities. WWU has not requested these costs to be passed onto the customer

5.46. As well as seeing money being returned to consumers as a result of theft investigations, there are additional future benefits of theft investigations to consumers even if money is not successfully recovered. An important benefit of investigating gas theft is the resulting increase in public safety. Theft of gas is an inherently dangerous activity, as interfering with gas apparatus could result in gas escapes which may lead to a serious incident This may not only cause harm to the property holder, but to others within or residing in neighbouring buildings.

5.47. Theft investigations also help to discourage future gas theft and to reduce customer bills, as those customers who pay their bills are covering the value of gas taken illegally.

6. Financial performance

This chapter presents the opening and closing position of the Regulatory Asset Value (RAV) for RIIO-GD1 and the GDNs' return on regulatory equity (RoRE) performance. It also identifies the key RoRE performance drivers.

Regulatory asset value

6.1. Regulatory Asset Value (RAV) is a financial balance representing the capitalised component of total expenditure on, in the case of the GDNs, building, maintaining and operating network assets used to distribute gas. The opening RAV balance for each GDN for RIIO-GD1 comprises the closing RAV balance from the previous formula year. Capitalisation rates are used to allocate totex spend to the RAV. The relevant capitalisation rates for the GDNs were set at RIIO-GD1 final proposals.[55] The closing RAV is calculated as: Opening RAV **plus** RAV additions (net of disposals) **less** RAV depreciation.

6.2. The price control allows licensees a return on their RAV and a return of money invested in the RAV, which comprises:

- a return on the RAV to compensate for the risk and opportunity cost borne by shareholders, and the efficient cost of financing provided by debt holders, who collectively fund the capital investment. The return is the vanilla weighted average cost of capital (WACC), which comprises:
  - Post-tax real cost of equity percentage (6.7%) fixed for eight years,
  - Notional gearing percentage weighting (65%) fixed for eight years, and
  - Pre-tax allowed cost of corporate debt percentage (CDE). We update the CDE during RIIO-GD1 based on the simple ten-year trailing average of the iBoxx[56] indices. This is updated annually as part of the annual iteration process. In 2014-15, 2015-16 and 2016-17, CDE has been determined as 2.72%, 2.55% and 2.38% respectively.[57] This methodology ensures that WACC moves in line with the efficient cost of debt financing available in the capital markets.

- an allowance to reflect depreciation over the average useful life of regulated assets. Depreciation allowances are included in allowed revenues and are deducted from the RAV.

[55] Totex capitalisation rates determined for each GDN at GD1 Final Proposals can be seen in Table 2.4 of the Finance and Uncertainty document. Non-repex is capitalised in the RAV as 'slow money' (which enters the RAV in the year after it is incurred) using a uniform rate across the 8 years, whereas repex is capitalised in the RAV as 'slow money' starting at 50% in 2013-14, increasing by instalments of 7.14% per annum to 100% in 2020-21.
[56] Markit iBoxx is a database of bond market data.
[57] The CDE for 2013-14 was published in GD1 Final Proposals – Finance and uncertainty supporting document and from then onwards in the cost of debt indexation model and respective AIP directions published yearly on the Ofgem website.

6.3. Table 6.1 shows a slight decrease in the RAV at the end of the price control year 2014-15.

Table 6.1: RIIO-GD1 RAV movements schedule 2014-15[58]

£m (2014/15 prices)	NGGD					NGN	SGN		WWU	
	EoE	**Lon**	**NW**	**WM**	**NGGD**	**NGN**	**Sc**	**So**	**WWU**	**Total**
Opening RAV (before transfers)	**2,991**	**1,957**	**2,058**	**1,552**	**8,558**	**1,862**	**1,524**	**3,393**	**1,923**	**17,261**
Transfers	-	-	-	-	-	-	-	-	-	**-**
Opening asset value (after transfers)	2,991	1,957	2,058	1,552	8,558	1,862	1,524	3,393	1,923	**17,261**
RAV additions (after disposals)	118	107	95	67	388	107	80	166	104	**844**
Depreciation	(149)	(99)	(104)	(79)	(431)	(95)	(79)	(173)	(97)	**(876)**
Closing RAV	**2,960**	**1,965**	**2,049**	**1,540**	**8,514**	**1,874**	**1,525**	**3,386**	**1,929**	**17,229**

Return on Regulatory Equity

6.4. Return on Regulatory Equity (RoRE) measures the return[59] on the Equity RAV. Regulatory equity represents the proportion of average annual RAV that is funded by shareholders (also known as 'Equity RAV'). This is based upon the notional gearing of 65% set at Final Proposals, which results in an equity proportion of 35% for the eight GDNs.

6.5. This measure is important for us to understand how well our price control approach encourages behaviours that are aligned to customers' interests. It will help us to identify ways we could improve settlements and associated incentives for RIIO-GD2. Returns represent the post-tax cost of equity set at Final Proposals plus revenue adjustments, derived from the following:

- *Totex incentive mechanism* – the incentive represents the percentage that a licensee bears for an overspend against allowances or retains for an underspend against allowances, as explained in chapter two.
- *IQI income reward/penalty* – A reward or penalty set at RIIO-GD1 Final Proposals, which reflects the accuracy and quality of the business plans submitted by the licensee.

[58] For the avoidance of doubt, values in this table are converted into 2014-15 price terms using the arithmetic average of the Retail Price Index (all items) published by the Office of National Statistics for each calendar month in the financial year.
[59] Returns are based on maximum allowed revenues (e.g. including output incentive and Totex Incentive Mechanism revenues), but exclude other returns (e.g. earned through excluded services revenue).

- *Output incentives* – These constitute incentive revenue earned by outperforming targets set for customer satisfaction, environmental emissions, gas shrinkage and NTS exit capacity, as explained in chapter three.

6.6. Estimates of the average (arithmetic) annual RoRE, over the eight years of RIIO-GD1, for each GDN, are presented in Table 6.2. These estimates are based on actual totex incurred up to 2014-15 plus the six-year forecast for 2015-16 to 2020-21. This data is consistent with the latest expenditure figures published in the GDNs' annual reports and reflects an expectation of how GDNs will perform in delivering outputs over the price control period. The estimates also incorporate actual incentive performance for 2014-15 and forecast incentive performance up to 2017-18 (from the latest MOD 186 reports published by the Joint Office of Gas Transporters[60]). The GDNs have not made forecasts for incentive performance for 2018-19 to 2020-21. For these years, we assume incentive performance is the average of actual and forecast incentive performance of the first five years of the price control. The estimates of RoRE are sensitive to these forecasts.

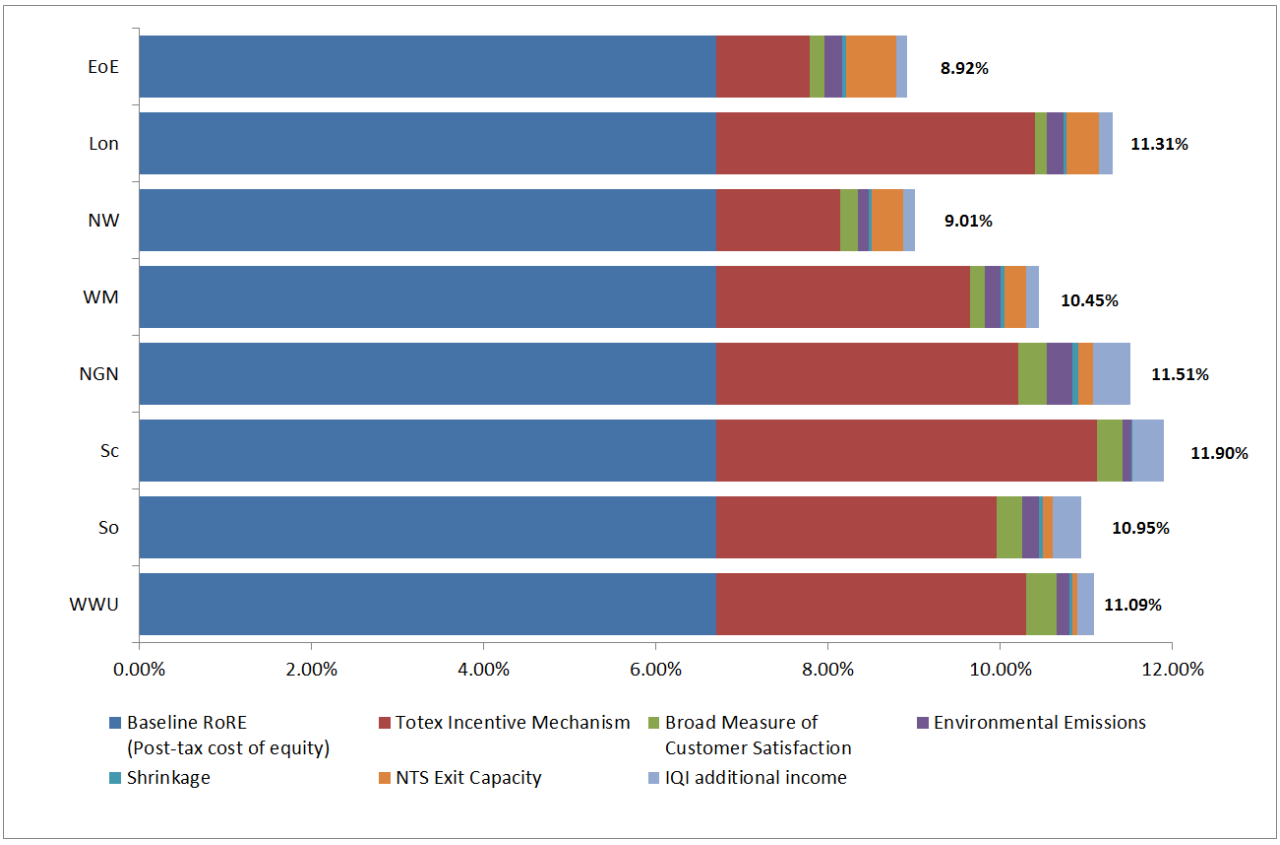
6.7. A useful way to gain an overall picture of how companies are performing under the price control is to assess each company's RoRE, compared to the assumed return used in setting allowed revenues. As part of the price control negotiation, we forecast in the 'GD1 Final Proposals – Finance and uncertainty supporting document'[61] that GDNs could achieve double-digit returns on RoRE for exceptional performance. Based on GDNs' forecast performance for the RIIO-GD1 period we have calculated that returns will range from 8.9% to 11.9%. The majority of the outperformance comes from the totex incentive mechanism where companies are underspending against allowances. The reasons behind this are set out in Chapter 5 and include: benefits from a second mild winter; the slower recovery of the economy leading to a reduced workload; and more efficient delivery of outputs. The RIIO regime is intended to incentivise efficient delivery of outputs and GDNs reported that several key areas of outperformance (including contractor strategy, innovation and network design) were made possible by the longer, eight-year duration of RIIO-GD1. We will continue to monitor GDNs' performance to ensure they deliver the outputs they have committed to over the full RIIO-GD1 period, and that efficiencies are not achieved at the expense of outcomes to consumers. Table 6.2 shows the composition of the forecast eight-year average RoRE for each of the GDNs:

[60] The Joint Office of Gas Transporters (JOGT) is an industry group responsible for administering governance of the processes for modifying the commercial regime which underpins the GB gas industry. The MOD 186 Revenue Reports, which provide detailed revenue forecasts for each GDN, can be viewed on the Joint Office website.
[61] See link to document in footnote 37

Table 6.2: GDN forecast eight-year RoRE

Company	GDN	Baseline RoRE (Post-tax cost of equity)	Totex Incentive Mechanism	Output Incentives				IQI additional income	Eight year RoRE
				Broad Measure of Customer Satisfaction	Environmental Emissions	Shrinkage	NTS Exit Capacity		
NGGD	EoE	6.70%	1.08%	0.18%	0.20%	0.05%	0.58%	0.13%	**8.92%**
	Lon	6.70%	3.71%	0.13%	0.19%	0.04%	0.37%	0.17%	**11.31%**
	NW	6.70%	1.45%	0.20%	0.13%	0.03%	0.37%	0.14%	**9.01%**
	WM	6.70%	2.95%	0.18%	0.18%	0.04%	0.26%	0.14%	**10.45%**
NGN	NGN	6.70%	3.51%	0.32%	0.31%	0.07%	0.16%	0.44%	**11.51%**
SGN	Sc	6.70%	4.42%	0.30%	0.10%	0.02%	0.00%	0.36%	**11.90%**
	So	6.70%	3.26%	0.30%	0.19%	0.04%	0.12%	0.33%	**10.95%**
WWU	WWU	6.70%	3.60%	0.35%	0.15%	0.03%	0.06%	0.19%	**11.09%**

Figure 6.3: GDN forecast eight-year RoRE



Appendices

Index

Appendix 1 – Customer bill impact method

1.1. The customer bill impact method mentioned in chapter two has been developed, with the GDNs, using a consistent approach across GDNs, and including inputs shown in Table A1.1. This year, we have revised the customer bill impact calculation to make it more transparent. The drivers of this calculation are GDN specific data for annual demand consumption (AQ), load factor, maximum daily capacity requirement (SOQ), revenue forecasts, and unit charges.

- The values for AQ are the reported average consumption value as of October each year in the 0-73,200 KWh (domestic) load band. AQ values have been provided by the GDNs and are based on domestic consumption volumes and customer numbers specific to each network.

- The load factors prevailing at the beginning of the regulatory year being reported have been used, from October 2013 to September 2014. These are consistent with Energy Networks Association's publication on Proposed Load Factors. Where a GDN has more than one local distribution zone (e.g. East of England has East Anglia and East Midlands) we have used a weighted average load factor based on customer numbers.

- SOQ is the daily maximum capacity requirement derived by dividing the AQ by the load factor and then by the number of days in the year.

- In estimating bill impacts, we use GDNs' actual unit charges (applied to the AQ and SOQ, presented in Table A1.1) for bills through to 2016-17. These unit charges, for each GDN, are available on the Joint Office of Gas Transporters' website.

- Bills from 2017-18 onwards are forecast by applying the percentage change in allowed revenue of each GDN. Revenue includes base revenue, pass through cost, incentives and adjustments. All revenue and prices are in 2014-15 prices. Revenue excludes exit capacity charges (the LDZ ECN charge).

Table A1.1 customer bill impact inputs for 2014-15

GDN	AQ (KWh)	Load factor (%)	SOQ (peak day KWh)
EoE	14,331	31.95%	123
Lon	14,394	30.70%	128
NW	14,110	34.10%	113
WM	14,163	30.20%	128
Sc	14,920	36.90%	111
So	14,155	29.04%	134
NGN	14,710	33.15%	122
WWU	12,936	31.00%	114

1.2. Stakeholders can calculate the charges by using the Joint Office transportation charge calculator and entering the following inputs shown in Table A1.2. The customer bill impact can be seen on the results page of the calculator.[62]

Table A1.2 Joint office transportation calculator inputs

Question	Enter
Where are you entering gas into the system?	National balancing point (NBP)
Where are you transporting gas to?	Distribution/CSEP connected load
Please input the full postcode	Enter post code
Are you a short haul tariff?	No
Please enter your ratio of throughput for the period Oct - Apr	Enter load factor for your GDN
What type of load is the site?	Non daily metered site
Is the site monthly read?	No
Annual AQ KWh/ annum (AQ)	See Table A1.1
SOQ calculation method	EUC code entry
EUC code	xx:E1401B

[62] The results may differ from Table 2.3 due to simplifications in the customer bill impact calculation in this report.

Appendix 2 – Safety secondary deliverables

1.1. Safety secondary deliverables are indicators that help to confirm that activities undertaken to decommission or otherwise improve the safety risk of the network's iron mains infrastructure are working in practice. The secondary deliverables relate to:

- length of mains off risk (km)
- numbers of pipe fractures and corrosion failures from iron mains
- number of occurrences of 'gas in buildings' events caused by iron mains
- number of incidents
- number of steel service pipes decommissioned.

1.2. Ultimately, safety-driven activities on network assets are undertaken to prevent incidents which can lead to damage to buildings, injuries and fatalities. While we monitor the occurrence of actual incidents, this is in itself an unhelpful measure to confirm the progressive improvement in safety risk achieved through an ongoing programme of network interventions. However, we use a range of indicators related to the safety of the network to demonstrate the extent of safety improvement trends.

1.3. Companies forecasted trends for these indicators in their RIIO-GD1 business plans and the safety secondary deliverables are based on these indicators. We expect these deliverables to be met by the end of the RIIO-GD1 period, supporting the achievement of companies' primary risk reduction commitments.

1.4. The relatively mild winter reduced the adverse effects of cold temperatures on network assets. This meant that pipe fractures and failures were lower than would have been expected in a seasonally normal winter. All GDNs were below the annualised target but all showed deterioration in performance from the previous year even though they have removed risk and decommissioned iron mains. Fewer fractures and failures would be expected to lead to lower numbers of iron mains related gas in buildings occurrences and the associated number of incidents. We examine companies' reported figures in the following sections to see how this turned out in practice.

Length of iron mains off-risk

1.5. The amount of safety risk connected with the integrity of iron mains is broadly proportional to the length of iron mains in service within a network. It is fundamentally the decommissioning of iron mains that reduces the safety risk

1.6. Table A2.1 shows that all of NGGD's four networks did not achieve the length of iron mains removed from risk that was expected either in the second year or over the first two years of RIIO-GD1. However, GDNs do not have an annual length commitment for taking iron mains off-risk and they can still meet their overall delivery level by the end of the price control period.

Table A2.1: Length of iron mains off risk

Company	GDN	Secondary deliverable		2015 actual delivery		first 2 years of RIIO-GD1	
		Overall RIIO-GD1 (km)	Annual Average from interpolations of the 8 year deliverable	length of iron mains abandoned (km)	Variance of 2015 actual against annual average of the 8 year deliverable	length of iron mains abandoned (km)	Length abandoned in RIIO-GD1 compared with annualised secondary deliverable
NGGD	EoE	4,798	600	565	(5.9%)	1,129	(5.9%)
	Lon	2,888	361	332	(8.1%)	644	(10.8%)
	NW	3,491	436	351	(19.7%)	772	(11.6%)
	WM	2,674	334	198	(40.6%)	511	(23.5%)
NGN	NGN	3,992	499	521	4.5%	1006	0.9%
SGN	Sc	1,993	249	257	3.0%	509	2.1%
	So	5,491	686	713	3.9%	1,478	7.7%
WWU	WWU	2,876	360	390	8.6%	749	4.2%

1.7. In line with the HSE iron mains reduction policy, the GDNs must decommission all Tier 1 (smaller diameter) iron mains that are within 30m of a property by 2032. At the start of RIIO-GD1 the Tier 1 mains represented approximately 95% of the 'at risk' iron mains population.

1.8. Performance in NGGD's WM GDN was particularly poor and NGGD reported that this was due to significant operational management challenges within their West Strategic Partnership. These issues have been addressed and NGGD expects performance to improve and for the eight-year target to be achieved in all of its GDNs. However, with a quarter of the RIIO-GD1 reporting period having passed, the scale of the increase in NGGD's workload in order to achieve the eight-year mains off risk target is significant and management intervention is required to meet length of mains off-risk.

1.9. Table A2.2 shows the expected and actual delivery of Tier 2 and Tier 3 mains. Companies have said the lower than expected delivery of Tier 2 and Tier 3 mains abandonment is because they have been planning the more efficient delivery of these larger diameter and more costly mains in the latter years of the price control period. We will continue to monitor the level of mains abandonment in diameter Tiers 2 and 3 while being aware that there may be opportunities to implement innovative techniques that prevent the need for full scale abandonment.

Table A2.2: Tier 2 and 3 workloads

Company	GDN	Assumed workload in setting RIIO-GD1 final proposals		2015 target after adjusting for Tier 2a workload	2015 actual delivery		Delivery after the first 2 years of RIIO-GD1	
		Total RIIO-GD1 8 year work load (km)	Annual average from interpolation of the 8 year workload (km)		Actual 2015 length of iron mains abandoned (km)	Variance of 2015 actual abandonment against 2015 assumed workload adjusted for Tier 2a	Actual length abandoned in RIIO-GD1	Variance of actual RIIO-GD1 abandonment against assumed workload adjusted for Tier 2a
NGGD	EoE	141	17.6	16.0	6.6	(58.4%)	9.8	(69.3%)
	Lon	274	34.3	30.0	5.6	(81.4%)	7.8	(86.8%)
	NW	195	24.4	19.6	17.9	(8.5%)	34.6	(16.0%)
	WM	99	12.4	8.9	2.1	(75.9%)	7.0	(63.6%)
NGN	NGN	285	35.6	33.0	31.6	(4.0%)	69.9	4.4%
SGN	Sc	156	19.5	19.3	1.3	(93.1%)	1.9	(95.1%)
	So	269	33.6	30.2	6.9	(77.2%)	12.2	(79.6%)
WWU	WWU	238	29.8	26.7	23.9	(10.5%)	48.5	(26.5%)

Fractures and failures

1.10. The failure mechanism for iron mains is brittle cast iron fracture and the corrosion of ductile iron – both of which can lead to significant gas escapes developing over a relatively short period of time, requiring urgent action. These types of failure mechanisms are the main concern for the safety of iron gas mains and the driver for the iron mains risk reduction policy.

1.11. It is known that the frequency of iron mains failures is related to ambient temperature, and the relatively mild winter experienced in 2014-15 resulted in a significantly lower number of failures than were forecast in all GDNs. All GDNs reported an increase on the previous year but believe the increase is due to deterioration. Table A2.3 sets out actuals versus average annual deliverables.

Table A2.3: Number of fractures and failures

Company	GDN	RIIO-GD1 target	Average Annualised target	2014 actual	2015 Actual
NGGD	EoE	13,517	1,690	999	1,213
	Lon	4,039	505	278	308
	NW	12,527	1,566	755	909
	WM	7,494	937	561	703
NGN	NGN	21,936	2,742	815	883
SGN	Sc	10,398	1,300	455	473
	So	12,887	1,611	1,077	1,145
WWU	WWU	8,529	1,066	581	616
Industry		**91,327**	**11,416**	**5,521**	**6,250**

Gas in building events

1.12. Gas in building (GIB) events are the pre-cursor of an incident which may cause structural damage to buildings, personal injuries and fatalities.

1.13. We expect incidences of such events to trend downwards as iron mains risk is progressively reduced. Therefore, it is a useful lagging indicator of the achievement of the iron mains primary safety output. The upward trend in GIBs has been observed across the GDNs. The GDNs have collectively engaged DNVGL to do further research as part of the annual review of the MRPS model and the outputs from this research will be reported to the GDNs at the National Replacement Forum

1.14. Table A2.4 shows the secondary deliverables against the 2014 and 2015 actual number of GIB events attributable to iron mains. We have indicated the annual secondary deliverable using a linear interpolation of the eight-year deliverable. This may not be an entirely fair representation of the level to be expected because ongoing iron mains abandonment work means that a non-linear outturn is likely to occur, ie a higher number in the earlier years of the price control period than in the later years. We also acknowledge that effects from outside the model, such as weather conditions, affect annual figures and longer-term trends provide better indications of underlying network characteristics.

Table A2.4: Secondary deliverable level and actual numbers of gas in buildings occurrences

Company	GDN	RIIO-GD1 target	Average Annualised target	2014 actual	2015 Actual
NGGD	EoE	911	114	74	123
	Lon	329	41	24	31
	NW	1069	134	54	89
	WM	633	79	47	77
NGN	NGN	1153	144	18	42
SGN	Sc	525	66	33	29
	So	605	76	64	94
WWU	WWU	550	69	37	45

Incidents

1.15. There were no incidents reported relating to iron mains that led to significant property damage, injury or loss of life.

Decommissioning steel service pipes

1.16. Steel service pipes are routinely decommissioned when they require any work, whether this is for customer-led reasons such as moving meter positions, attending to escapes or renewed as part of a mains replacement programme. This is because the corrosion of the material is known to represent a safety hazard and the scale of the work requires high investment.

1.17. Table A2.5 shows that three of NGGD's GDNs (East of England, London and North West) and SGN's Southern network have undertaken more domestic service replacement activities than the annual RIIO-GD1 deliverable. Northern, Scotland and Wales and West have for the second year running undertaken a lower number of domestic service replacements. West Midlands also had a lower number of service replacements which links to the lower amount of iron mains off risk work they undertook.

Table A2.5: Number of domestic service replacements – 2014-15[63]

GDN	Replacement with service alteration	Replacement after escape	Replacement associated with smart metering	Replacement with mains replacement	Other replacement	Total	Annualised RIIO-GD1 target	Variance %
EoE	2,547	3,095	8	26,219	3,362	35,232	30,377	16%
Lon	1,008	4,161	5	26,452	2,192	33,818	21,481	57%
NW	1,305	4,650	10	20,982	2,785	29,733	28,383	5%
WM	1,404	2,698	12	13,010	2,844	19,968	21,125	(5%)
NGN	1,065	4,176	0	23,506	862	29,609	30,932	(4%)
Sc	161	1,354	0	9,017	1,344	11,876	13,224	(10%)
So	1,259	5,593	0	46,040	3,510	56,402	49,574	14%
WWU	686	3,934	0	18,057	742	23,419	25,209	(7%)

[63] Other replacement includes all domestic services that have had to be replaced because they could not continue to be safely operated.

Appendix 3 – Maintaining operational performance - secondary deliverables

1.1. Maintaining operational performance is measured through six secondary deliverables:

- Number and value of offtake meter errors – annual commitment
- Duration of telemetry faults – annual commitment
- PSSR fault rate – annual commitment
- Gas holder demolition – eight-year commitment
- Maintenance of network records – annual commitment
- Health, criticality and risk metrics – eight-year commitment.

Number and value of offtake meter errors

1.2. All GDNs achieved a level of offtake metering errors significantly within the required limit of 0.1% of throughput. Only East of England, and Wales and West reported errors of between 0.001% and 0.028%, the remaining GDNs having none.

Duration of telemetered faults

1.3. This output provides a commitment to limit the duration of faults detected by telemetry systems. Telemetry provides the companies with continuous data on the operational state of the remote, unmanned outstations and will report faults to the distribution control centres.

1.4. As shown in table A3.1, Southern failed to achieve the level of performance for the second year, though they significantly improved their performance compared to the previous year. NGGD reported that a reporting error had been detected in its systems that resulted in the understatement of the telemetered faults in the 2013-14 annual report. The figure in this table for 2014 is based on the restated data contained in their 2014-15 submission.

Table A3.1: Duration of telemetered faults

Company	GDN	Hours per AGI			
		2014		2015	
		Deliverable limit	Actual	Deliverable limit	Actual
NGGD	NGGD	127	109	123	119
NGN	NGN	211	105	196	63
SGN	Sc	238	140	238	100
	So	134	297	134	174
WWU	WWU	181	16	168	5

PSSR fault rate

1.5. As shown in table A3.2, all GDNs reported that their PSSR fault performance equalled or outperformed their secondary deliverables. In 2014, we highlighted that WWU did not meet this secondary output. Following discussions with WWU, we are satisfied that this was due to consistency of reporting against how the output was set in final proposals.

Table A3.2 Number of PSSR faults[64]

Company	GDN	Fault Rate			
		2014		2015	
		Deliverable limit	Actual	Deliverable limit	Actual
NGGD	EoE	8.0%	5.0%	8.0%	5.4%
	Lon	9.0%	4.0%	9.0%	4.4%
	NW	18.0%	11.0%	16.0%	11.4%
	WM	6.0%	5.0%	6.0%	5.4%
NGN	NGN	51.0%	42.6%	51.0%	26.3%
SGN	Sc	35.6%	22.3%	35.6%	25.7%
	So	20.9%	19.4%	20.9%	20.9%
WWU	WWU	7.3%	48.1%	7.2%	5.7%

Gas holder demolition

1.6. GDNs have a programme for gas holder demolition, made possible by the availability of alternative diurnal storage.65

1.7. We are monitoring progress towards the agreed number of gas holders being demolished, alongside reliability outputs for assessment at the end of the period. There are no formal annual output commitments.

[64] There are 2 ways a GDN can report PSSR fault rates. Each GDN is consistent in its reporting across the formula years but direct comparison between GDNs using different reporting methods is not possible.
[65] Diurnal storage is required to manage within-day fluctuations in gas demand. Storage may be provided using vessels, for example low pressure gas holders, or the pressurisation and depressurisation of pipelines, which is known as linepack.

1.8. Table A3.3 below compares the actual and assumed number of sites demolished in the first two years, together with the output level of sites for demolition and companies' forecast number by the end of the RIIO-GD1 period.

Table A3.3: Low pressure holder demolition

Company	GDN	2015 Actual	Cumulative Actual	RIIO-GD1 Target	RIIO-GD1 Forecast
NGGD	EoE	5	14	29 to 30	29
	Lon	10	11	32 to 33	33
	NW	5	5	35	35
	WM	0	0	4 to 5	4
NGN	NGN	2	3	23 to 24	23
SGN	Sc	2	2	11	14
	So	8	11	44 to 45	55
WWU	WWU	7	9	7 to 8	10
Industry		**39**	**55**	**185 to 191**	**203**

1.9. Both NGGD and SGN have transferred redundant gas holder sites to their respective commercial property companies. Along with the property transfer, they also transferred an amount equal to the unit cost agreed in the RIIO-GD1 Final Proposals. As a result, both NGGD and SGN are confident that they will meet the agreed output by the end of the price control period. This transfer arrangement is currently under review.

Maintenance of network records

1.10. The effective management of the network is reliant on maintaining good technical records of the live apparatus and that these records are kept up-to-date.

1.11. GDNs are measured on the time taken to digitise new and abandoned pipes on their mapping systems. Northern's performance deteriorated due to a lack of focus but it reports that corrective measures have been put in place. NGGD made significant improvements since last year; it has visited the other GDNs to see how they digitise their records and are looking to see how it can change its process. The performance of the GDNs is summarised in table A3.4.

Table A3.4: Number of business days to digitise network records (% digitised by length)

Company	GDN	2014			2015		
		< 30 days	< 60 days	> 60 days	< 30 days	< 60 days	> 60 days
NGGD	EoE	45.0%	21.0%	34.0%	66.0%	29.1%	4.9%
	Lon	63.0%	19.0%	18.0%	72.0%	23.8%	4.2%
	NW	47.0%	27.0%	26.0%	72.5%	22.2%	5.3%
	WM	67.0%	15.0%	19.0%	83.0%	13.4%	3.5%
NGN	NGN	66.8%	14.0%	15.0%	47.1%	17.0%	35.9%
SGN	Sc	98.0%	2.0%	1.0%	94.1%	5.4%	0.5%
	So	97.0%	1.0%	2.0%	97.7%	1.0%	1.3%
WWU	WWU	96.0%	2.0%	2.0%	97.7%	1.7%	0.6%

Health, criticality and risk metrics

1.12. Health, criticality and risk metrics are used to monitor the state of network assets in terms of the total of risk around safety, reliability and environment. Companies influence the risk level by carrying out interventions that improve risk, generally by reconditioning or replacing assets or asset sub components.

1.13. Companies were unable to provide a methodology that consistently reports asset health, criticality and risk by the start of RIIO-GD1. We are working with the companies to achieve comparable reporting measures and agree an assessment methodology for managing the risk of network assets. Considerable progress has been achieved and the companies have committed to provide a Network Output Measures Methodology by the end of March 2016 and to submit a comprehensive reporting of the risk using the new agreed common methodology in July 2016. A subsequent validation exercise will be carried out and be available for assessment in March 2017.

Appendix 4 – Actions required under the HSE 'three tier' iron mains risk reduction policy

1.1. GDNs must comply with the Health and Safety Executive's published policy for iron mains risk reduction.

1.2. Table A4.1 describes the actions required under each diameter band or 'tier'.

Table A4.1: Action required by diameter band or tier

Diameter band	Iron pipe nominal diameter range	Summary of required actions
Tier 1 mains	8 inches or less	Must still achieve full decommissioning by 31 March 2032 and replace an agreed length of mains each year (as under the old policy) but can prioritise replacement based on a wide range of benefits, including reductions in gas losses, operating costs and improvements in safety risk.
Tier 2 mains above the risk action threshold	greater than 8 inches and less than 18 inches	All mains exceeding a defined risk-action threshold must, by 31 March 2021, be abandoned, remediated or assessed for continued safe use (Tier 2a)
Tier 2 mains below the risk action threshold	greater than 8 inches and less than 18 inches	Pipes in Tier 2 scoring below the risk-action threshold may be decommissioned where this is justified in cost benefit terms (Tier 2b)
Tier 3 mains	18 inches or above	GDNs may replace mains if the replacement is justified in cost benefit terms

Appendix 5 – Planned and unplanned interruptions performance

Table A5.1: Number of planned interruptions

Company	GDN	Number of planned interruptions					
		2014-15			RIIO-GD1		
		Target	Actual	Variance	Target	Forecast	Variance
NGGD	EoE	82,188	74,460	9.4%	657,504	612,371	6.9%
	Lon	51,195	55,737	(8.9%)	409,561	466,326	(13.9%)
	NW	68,967	48,947	29.0%	551,735	425,116	22.9%
	WM	50,132	30,781	38.6%	401,054	359,768	10.3%
NGN	NGN	50,961	57,434	(12.7%)	407,690	400,120	1.9%
SGN	Sc	35,292	28,754	18.5%	282,335	230,471	18.4%
	So	85,816	95,698	(11.5%)	686,526	686,526	(0.0%)
WWU	WWU	56,404	55,623	1.4%	451,235	415,007	8.0%

Table A5.2: Number of unplanned interruptions[66]

Company	GDN	Number of unplanned interruptions					
		2014-15			RIIO-GD1		
		Target	Actual	Variance	Target	Forecast	Variance
NGGD	EoE	13,365	12,451	6.8%	106,922	91,235	14.7%
	Lon	11,076	11,454	(3.4%)	88,605	97,456	(10.0%)
	NW	12,699	11,263	11.3%	101,591	85,562	15.8%
	WM	8,822	7,368	16.5%	70,575	58,748	16.8%
NGN	NGN	8,380	13,034	(55.5%)	67,040	91,998	(37.2%)
SGN	Sc	2,152	5,079	(136.0%)	17,217	39,622	(130.1%)
	So	8,677	19,608	(126.0%)	69,417	156,079	(124.8%)
WWU	WWU	11,271	10,062	10.7%	90,169	78,203	13.3%

Table A5.3: Duration of planned interruptions (millions of minutes)

Company	GDN	Duration of planned interruptions - million of minutes					
		2014-15			RIIO-GD1		
		Target	Actual	Variance	Target	Forecast	Variance
NGGD	EoE	38	28	27.5%	307	239	22.4%
	Lon	32	22	30.1%	256	192	24.9%
	NW	36	19	46.2%	286	166	41.8%
	WM	25	14	42.3%	200	144	28.1%
NGN	NGN	27	30	(11.0%)	218	216	0.9%
SGN	Sc	12	11	8.0%	98	88	9.7%
	So	31	37	(21.5%)	245	245	(0.0%)
WWU	WWU	12	14	(18.9%)	92	92	0.2%

[66] Includes major incidents when there is a loss of supply to greater than 250 customers following a single incident.

Table A5.4: Duration of unplanned interruptions (millions of minutes)

Company	GDN	Duration of unplanned interruptions - millions of minutes					
		2014-15			RIIO-GD1		
		Target	Actual	Variance	Target	Forecast	Variance
NGGD	EoE	6	14	(133.0%)	50	117	(135.4%)
	Lon	14	54	(294.1%)	111	436	(294.7%)
	NW	10	7	29.2%	78	71	8.8%
	WM	6	8	(41.2%)	48	74	(54.8%)
NGN	NGN	8	4	46.8%	63	33	47.4%
SGN	Sc	15	4	72.6%	121	28	76.4%
	So	23	23	(3.0%)	181	148	18.2%
WWU	WWU	6	9	(66.9%)	45	44	3.0%
Industry		**87**	**109**	**(25.9%)**	**695**	**794**	**(14.2%)**

Table A5.5: Summary of interruptions performance

	Number of interruptions	Duration of interruptions
Planned	**Lon**- Reduction on 2013-14 but still did not meet the linear annual output commitment. With an increased workload forecast, we believe there is a risk of failure. NGGD (Lon) also forecasts to fail this output. **NGN**- Higher than annual commitment for 2014-15; however, RIIO-GD1 average so far is not above allowance and NGN is forecasting to meet this output. **So**- Reduction on 2013-14 but higher than linear annual output. SGN forecasts to meet this output; however, we believe there is a risk of failure based on the first two years' performance.	**NGN**- Higher than linear annual commitment for 2014-15; however, RIIO-GD1 average so far is not above allowance. NGN is forecasting to meet this output. **So**- Large reduction in planned duration since 2013-14; however, did not meet annual output commitment for second year. SGN is forecasting to meet this output; however, based on the first two years' performance, we believe there is a risk they won't. **WWU**- Higher planned interruption duration than annual output commitment for second year. WWU still forecasting to meet the eight-year commitment.
Unplanned	**NGN**, **SGN (So and Sc)** and **Lon** did not meet the linear output commitment and for the second year all are forecasting to fail the eight-year output for number of unplanned interruptions.	**EoE, Lon** and **WM** were all largely in excess of the linear annual output commitment for the second year and are forecasting to fail the eight-year output. **WWU** was in excess of the linear annual commitment for the second year. It is forecasting to meet the eight-year output.

Appendix 6 – Guaranteed standards of performance

Table A6.1: Guaranteed standards of performance – 2014-15

Guaranteed standard of performance	Target	EoE	Lon	NW	WM	NGN	Sc	So	WWU	Industry
Guaranteed Standard 4 - Regulation 10 - Provision of standard connection quotations =<275kWh per hour	90%	99.17%	98.91%	99.40%	99.15%	99.68%	99.50%	99.65%	99.58%	-
	-	£5,531	£3,130	£1,895	£630	£860	£630	£770	£1,870	£15,316
Guaranteed Standard 5 - Regulation 10 - Provision of non-standard connection quotations =<275kWh per hour	90%	99.17%	97.07%	98.31%	98.64%	99.63%	99.28%	98.38%	98.58%	
	-	£460	£1,460	£350	£510	£1,590	£1,160	£7,620	£7,150	£20,300
Guaranteed Standard 6 - Regulation 10 - Provision of non-standard connection quotations > 275kWh per hour	90%	96.50%	97.99%	99.08%	100.00%	98.70%	100.00%	99.22%	97.75%	
	-	£970	£2,280	£60	£0	£1,080	£0	£1,500	£1,280	£7,170
Guaranteed Standard 7 - Regulation 10 - Accuracy of quotations (percentage of quotations challenged but found to be accurate)	-	75.00%	44.44%	100.00%	100.00%	No accuracy challenges reported				-
	-	£0	£0	£0	£318	£0	£0	£0	£0	£318
Guaranteed Standard 8 - Regulation 10 - Response to land enquiries	90%	99.04%	98.98%	99.05%	98.82%	99.59%	94.57%	99.22%	99.55%	-
	-	£2,620	£2,680	£930	£1,890	£330	£1,750	£990	£540	£11,730
Guaranteed Standard 9 - Regulation 10 - Offering a date for commencement and substantial completion of connection works (=<275kWh per hour)	90%	98.50%	95.39%	98.89%	99.53%	99.79%	99.31%	99.70%	99.91%	
	-	£17,352	£20,833	£3,180	£2,105	£1,740	£3,660	£2,210	£1,320	£52,401
Guaranteed Standard 10 - Regulation 10 - Offering a date for commencement and substantial completion of connection works (> 275kWh per hour)	90%	100.00%	92.00%	96.67%	100.00%	98.48%	99.30%	100.00%	99.42%	
	-	£0	£1,000	£40	£0	£500	£40	£0	£200	£1,780
Guaranteed Standard 11 - Regulation 10 - Substantial completion on agreed date	90%	93.80%	92.67%	98.71%	96.74%	98.58%	97.73%	99.00%	93.92%	
	-	£115,988	£74,033	£5,342	£18,930	£12,020	£8,936	£10,959	£54,199	£300,405
Standard Special Condition D10(2)(f) Responding to telephone calls	90%	92.96%	92.96%	92.96%	92.96%	92.96%	92.96%	92.96%	92.96%	-
	-	-	-	-	-	-	-	-	-	-
Total	**-**	**£142,921**	**£105,416**	**£11,797**	**£24,383**	**£18,120**	**£16,176**	**£24,049**	**£66,559**	**£409,420**

Table A6.2: Additional Guaranteed standards of performance – 2014-15

Guaranteed standard of performance		EoE	Lon	NW	WM	NGN	Sc	So	WWU	Industry
Guaranteed Standard 1 - Regulation 7 - Supply Restoration	Number of payments	3461	35786	5001	5216	1095	1001	9298	4852	
	Total value of payments	£104,780	£1,081,060	£151,080	£157,970	£32,890	£30,230	£281,260	£147,240	£1,986,510
Guaranteed Standard 2 - Regulation 8 - Reinstatement of customer's premises	Number of payments	2244	1595	599	768	279	61	809	420	
	Total value of payments	£113,800	£80,000	£29,950	£38,400	£14,500	£3,050	£41,500	£21,500	£342,700
Guaranteed Standard 3 - Regulation 9 - Priority domestic customers	Number of payments	11	18	5	11	0	0	0	31	
	Total value of payments	£264	£432	£120	£264	£0	£0	£0	£744	£1,824
Guaranteed Standard 13 - Regulation 10A - Notification of planned supply interruptions	Number of payments	175	94	141	159	46	5	13	15	
	Total value of payments	£3,500	£1,880	£2,820	£3,180	£950	£130	£260	£300	£13,020
Guaranteed Standard 14 - Regulation 10B - Response to complaints	Number of payments	1755	3095	1181	1058	0	1	29	3	
	Total value of payments	£35,100	£61,900	£23,620	£21,160	£0	£20	£580	£60	£142,440
Guaranteed Standard 12 - Regulation 12 - Payments	Number of payments	1479	1276	585	368	168	67	400	23	
	Total value of payments	£29,580	£25,520	£11,700	£7,360	£3,360	£1,340	£8,000	£460	£87,320
Total	-	**£287,024**	**£1,250,792**	**£219,290**	**£228,334**	**£51,700**	**£34,770**	**£331,600**	**£170,304**	**£2,573,814**

Appendix 7 – Network innovation allowance summary

1.1. Tables A7.1-A7.4 summarise the active NIA projects undertaken by the companies in 2014-15.

Table A7.1: Network innovation allowance – NGGD

Total NIA expenditure by project	EoE	Lon	NW	WM	NGGD
	£m	£m	£m	£m	£m
NIC Bid Preparation Costs	0.00	0.00	0.00	0.00	0.00
Optimise Own Energy Use	0.00	0.00	0.00	0.00	0.01
Development of DANINT FWAVC software for New Gas Chromatograph	0.01	0.01	0.01	0.01	0.03
Development of Packaged Solution for Bio Methane Injection	0.08	0.05	0.05	0.04	0.22
e Pipe – Trial internal lining assessment and development of small diameter pipelines	0.01	0.01	0.01	0.01	0.04
Internal Stress Corrosion Cracking (ISCC) Assessment Work	0.01	0.01	0.01	0.00	0.03
Optomole (Stage 1)	0.02	0.01	0.02	0.01	0.06
Acoustek	0.06	0.04	0.04	0.03	0.17
Orifice Plate Deformation	0.01	0.00	0.00	0.00	0.02
Sealback II	0.02	0.01	0.01	0.01	0.05
Fracture Monitoring using Acoustics	0.01	0.00	0.00	0.00	0.02
Seams Analytical Pilot	0.02	0.01	0.01	0.01	0.06
Cast Iron Fitness For Purpose (CIFFP)	0.02	0.01	0.01	0.01	0.05
Cured In-Place Pipe (CIPP) (Stage 2)	0.08	0.05	0.06	0.04	0.23
Pressure to Gas	0.02	0.01	0.01	0.01	0.05
Pipeline Failure Rate Determination Due to Inland Natural Landsliding	0.01	0.00	0.01	0.00	0.02
Thin Walled PE Liners	0.05	0.03	0.04	0.03	0.14
Alternative Riser Pipe Jointing Method - Pyplok	0.09	0.05	0.06	0.04	0.25
Demand Allocation	0.08	0.05	0.05	0.04	0.22
TD Williamson Guided Wave Non Destructive Testing Inspection for High Rise Buildings	0.03	0.02	0.02	0.01	0.08
Orbis Oxifree (TM198) Corrosion Coating	0.01	0.00	0.01	0.00	0.02
Multi-Occupancy Building CIP (HTC Serline)	0.02	0.01	0.01	0.01	0.04
Development of Specification for PE Repair Systems	0.03	0.02	0.02	0.01	0.08
Investment Prioritisation in Distribution Systems	0.05	0.03	0.03	0.02	0.13
The impact of biomethane on odorisation in gas distribution networks	0.01	0.01	0.01	0.01	0.03
On-Line Fourier Transform Infrared Siloxane Analyser for Monitoring Biomethane Sites	0.03	0.02	0.02	0.01	0.08
MEG Improvement Phase 2B	0.02	0.01	0.01	0.01	0.04
Asset Health & Criticality Modelling	0.01	0.01	0.01	0.00	0.03
Study of crater formation threshold during gas leakage on high pressure pipes	0.00	0.00	0.00	0.00	0.01
Tier 1 Replacement System Stage 3	0.02	0.01	0.01	0.01	0.05
Development of "AGI safe"	0.02	0.01	0.01	0.01	0.05
Guided Wave Non Destructive Testing Inspection of	0.02	0.01	0.02	0.01	0.07

Mains Pipelines					
Resource and Asset Reuse Toolkit	0.00	0.00	0.00	0.00	0.01
Review and Validation of the current gas demand forecasting methodology	0.04	0.02	0.03	0.02	0.12
Optimal use of Quick Response (QR) Codes	0.04	0.02	0.02	0.02	0.10
Intelligent CO Monitors	0.05	0.03	0.04	0.03	0.15
Asset Health & Criticality Modelling (Pipelines)	0.01	0.01	0.01	0.01	0.04
Iron Mains Condition Assessment System Phase 3	0.27	0.15	0.18	0.13	0.73
Pipeline Research Council International (PRCI) 14-15	0.05	0.03	0.03	0.02	0.13
European Pipeline Research Group (EPRG) 14-15	0.01	0.01	0.01	0.00	0.03
Risk Assessment Methodologies for Pipelines & Installations 14-15	0.01	0.01	0.01	0.01	0.04
Siloxane Impact Study	0.00	0.00	0.00	0.00	0.01
MEG Improvement Phase 2C	0.01	0.01	0.01	0.01	0.04
Multi-Occupancy Building Cured In Place Lining (Nu Flow)	0.01	0.01	0.01	0.01	0.04
Temporary Gas Supplies	0.00	0.00	0.00	0.00	0.00
CIP Riser Specification	0.02	0.01	0.01	0.01	0.04
Tier 1 Replacement System Stage 4.1	0.22	0.13	0.15	0.11	0.60
MEG Fogger Trial Phase 3	0.16	0.09	0.11	0.08	0.44
Jointing Techniques for PE Pipelines up to 10 bar	0.01	0.00	0.01	0.00	0.02
Introduction of 19 Bar PE Pipeline in the UK Gas Network	0.36	0.21	0.24	0.18	0.99
Review of the FWACV Billing Regime	0.01	0.01	0.01	0.00	0.03
KOBUS Gas Pipe Puller	0.04	0.02	0.03	0.02	0.12
PRISM (Pipe replacement in situ manufacturing) – Strategy and High Level Plan for Delivery	0.00	0.00	0.00	0.00	0.01
Project Futurewave	0.05	0.03	0.04	0.03	0.15
Examination of the relationship between leakage and operating pressure in MP systems	0.01	0.01	0.01	0.01	0.04
Pressure to Gas (Phase 2)	0.03	0.02	0.02	0.01	0.08
Tier 1 Replacement System Stage 4.2	0.25	0.14	0.17	0.12	0.68
Fence Feet Improvements	0.01	0.00	0.00	0.00	0.01
High Altitude Aerial Surveillance	0.04	0.02	0.03	0.02	0.10
PRISM Phase 2	0.16	0.09	0.11	0.08	0.43
Demand Allocation Phase 2	0.03	0.02	0.02	0.02	0.09
WEKO Seal Removal	0.01	0.01	0.01	0.00	0.02
2014-15 prior year adjustment	0.00	0.00	0.00	0.00	0.00
Total Gross Costs	2.80	1.59	1.88	1.37	7.64
3rd party income / contribution received	0.00	0.00	0.00	0.00	0.00
Total Net Costs	2.80	1.59	1.88	1.37	7.64

Table A7.2: Network innovation allowance - Northern

Total NIA expenditure by project	£m
017 - IFI - EIC - Stress Corrosion Crack	0.00
020 - IFI - EIC - Orifice Plate Deformat	0.01
024 - Accurate Detection with Minimal Ex	0.00
030 - IFI - Predictive Analytics	0.19
033 - IFI - EIC - E-Pipe	0.01
039 - Improved Diurnal Storage Model	0.02
042 - Visual & Accoustic Leakage Detection	0.08
044 - Cast Iron Fitness-for-Purpose	0.02
049 - Strategy to Reduce Gas Leakage	0.08
057 - EIC - Guided Wave Technology	0.00
052 - EIC - Smart Document Solutions	-0.02
058 - EIC - Orbis	0.01
077 - Risk Specification Prioritisation	0.02
080 - Management of wastewater	0.03
090 - Project Furturewave	0.13
097 - NIC Bid Prep 2014	0.16
099 - LCNI Conference 2014	0.11
055 - Gas PTII	0.00
003 - IFI - EIC - DANNIT	0.02
015 - IFI - CIPPS	0.07
035 - IFI - EIC - Syrinix (Fracture Monitoring Using Acoustics)	0.04
036 - IFI - EIC - Optosci (Optomole)	0.02
045 - Remote Water Removal System	0.27
046 - Biomethane Connection Guidelines	0.04
048 - EIC - Acoustek	0.08
050 - EIC - UAV	0.08
060 - EIC - Intelligent CO detector	0.05
061 - Investment Prioritisation Dist Sys	0.04
064 - Asset Health Management	0.02
068 - New MSB	0.03
070 - Improving customer operations by 24 hour site safety monitoring	0.19
073 - EIC HTC Serline Riser	0.01
075 - EIC Guided Wave	0.06
079 - Low Carbon Energy Solutions with Thirteen	0.02
081 - Provision of Temporary Gas Supplies	0.01
083 - Development of specification for PE Repair Systems	0.00
084 - Nuflow	0.01
088 - Stub End	0.06
098 - Asset Health & Criticality Pipelines	0.01
100 - Service Water Extraction	0.11
110 - T-shale part one	0.04
111 - T-shale part two	0.10
114 - H21 Leeds citygate	0.02
118 - C02 capture through mineralisation	0.03
120 - Predictive Analytics	0.11
Total Gross Costs	2.36
3rd party income / contribution received	0.00
Total Net Costs	2.36

Table A7.3: Network innovation allowance - SGN

Total NIA expenditure by project	Sc	So	SGN
	£m	£m	£m
NIA0056 -KEYHOLE MAINS & SERV REPLACEMENT	0.26	0.59	0.85
NIA0024 -RCA GPS SURVEY	0.12	0.27	0.38
NIA0023 -CIPP STG 2	0.09	0.21	0.30
NIA0050 -NIA SEEKER PARTICLES STAGE 2	0.07	0.17	0.24
NIA0066 -IFI REAL TIME NETW FEAS STUDY	0.07	0.16	0.23
NIA0065 -FUTUREWAVE SOCIAL ENERGY	0.05	0.11	0.15
NIA0058 - GAS POLYMERISATION - PROOF OF CONCEPT	0.05	0.10	0.15
NIA0049 -NIA EIC MEMBERSHIP 2014-15	0.04	0.09	0.12
NIA0057 - AEROSOL SEALANT - STAGE 1A - INITIAL DEVELOPMENT	0.03	0.07	0.10
NIA0044 -ASSET HEALTH & CRITICALITY INDICES (HCI)(ACOUSTEK)	0.03	0.06	0.09
NIA0043 -INVESTMENT PRIORITISATION IN DISTRIBUTION SYSTEMS (STAGE 1)	0.03	0.06	0.08
NIA0035 -VTOL UNMANNED AERIAL VEHICLE	0.02	0.04	0.06
NIA0027 -WATER EXTRACTION REEL & BRANCH	0.02	0.04	0.05
NIA0052 -NIA CORE DRILL AND FLOW STOP	0.01	0.03	0.05
NIA0059 -PE PIPE AND FITTINGS REPAIR SYSTEMS STAGE 1	0.01	0.03	0.04
NIA0028 -GECO PUMP	0.01	0.03	0.04
NIA0029 -BOND & BOLT SADDLE SYSTEM	0.01	0.03	0.04
NIA0041 -ASSET HEALTH & CRITICALLITY INDICES	0.01	0.03	0.04
NIA0034 -CAST IRON FITNESS FOR PURPOSE	0.01	0.02	0.03
NIA0016 -STARLINE/MARWIN VBR	0.01	0.02	0.03
NIA0006 -GAS LEAK DETECTION	0.01	0.02	0.03
NIA0031 -STENT BAG	0.01	0.02	0.02
NIA0037 -OSCILLATING ENERGY HARVESTER Ph2	0.01	0.02	0.02
NIA0040 -ACOUSTIC COMMUNICATION IN GAS MAINS	0.01	0.02	0.02
NIA0061 - 40MM SERVIFLEX	0.01	0.02	0.02
NIA0063 -SPECIFICATION FOR THE LINING OF RISERS FOR MULTIPLE OCCUPANCY BUILDINGS	0.01	0.02	0.02
NIA0020 -NPRS STG 1	0.01	0.01	0.02
NIA0033 -UNIVERSAL T-BAR	0.01	0.01	0.02
NIA0018 -MICROSTOP	0.00	0.01	0.01
NIA0062 -ASSET HEALTH MODELLING (PIPELINES)	0.00	0.01	0.01
0 -Collaboration Film	0.00	0.01	0.01
0 -TO PARTICIPATE IN AND SPONSOR THE LCNI CONFERENCE	0.00	0.01	0.01
NIA0048 -BAR HOLING/ROCK DRILLING ZONE	0.00	0.01	0.01
NIA0060 -SILOXANE IMPACT STUDY	0.00	0.01	0.01
NIA0002 -Immersions Tube Preheating Modifications - Field Trials	0.00	0.01	0.01
NIA0030 -SAT FIELD TRIALS	0.00	0.01	0.01
NIA0051 -NIA OLYMPIC RINGS FOR RIIO	0.00	0.01	0.01
NIA0047 -GAS RISK IN "NO ACCESS" PROPERTIES (STAGE1)	0.00	0.00	0.01
NIA0015 -PNEUMATIC PE PUSHING MACHINE	0.00	0.00	0.01
NIA0045 -NEW CORROSION PROTECTION TECH (ORBIS)	0.00	0.00	0.00
NIA0005 -ORPHEUS VALVE FILTER CORR SYS	0.00	0.00	0.00
NIA0019 -LARGE CISBOT	0.00	0.00	0.00

NIA0013 -DIURNAL STORAGE MODELLING STAGE 2	0.00	0.00	0.00
NIA0009 -ORIFICE PLATE DEFORMATION	0.00	0.00	0.00
NIA0011 -Develop DANINT FWAC software	0.00	0.00	0.00
NIA0014 -DESIGN AND FUNCTIONALITY OF THE TORNADO	0.00	0.00	-0.01
NIA0036 -SYRINIX FRACTURE MONITORING	0.00	-0.01	-0.02
NIA0004 -PE - ASSET LIFE RESEARCH	-0.01	-0.02	-0.03
Total Gross Costs	1.02	2.31	3.33
3rd party income / contribution received	0.00	0.00	0.00
Total Net Costs	1.02	2.31	3.33

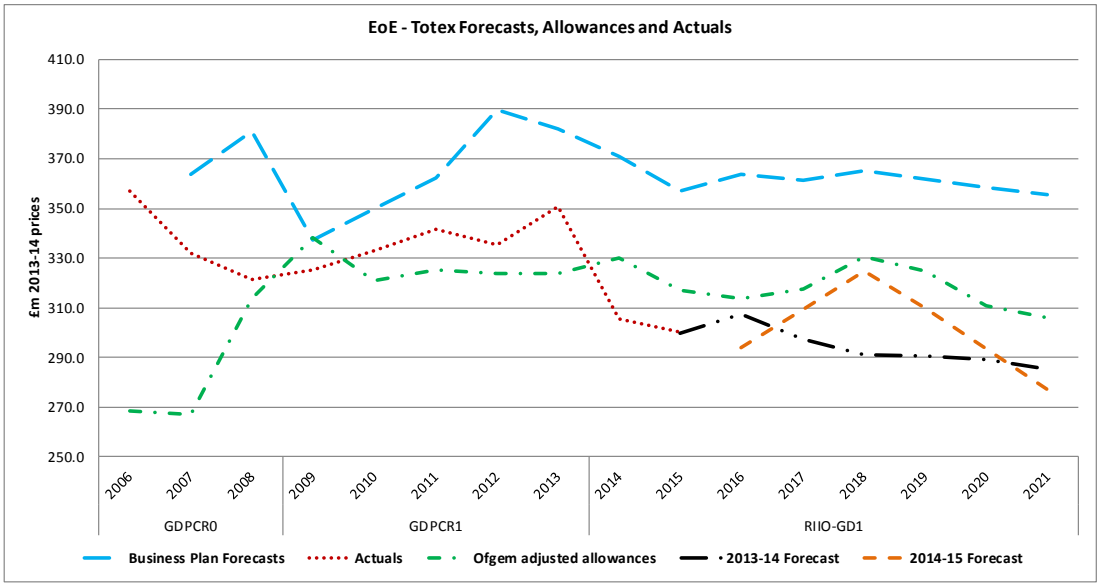
Table A7.4: Network innovation allowance - WWU

Total NIA expenditure by project	**£m**
Asset Health & Criticality Modelling	0.03
Asset Health Modelling (Pipelines, Special Crossings, block valves)	0.02
Cast Iron Fitness for purpose (CIFFP)	0.01
Cured in-place pipe (CIPP (stage 2))	0.06
Development of Danint FWAVC Software for New Gas Chromatograph	0.01
Diurnal storage	-0.05
Iron Mains Condition Assessment System Phase 3a	0.00
e Pipe – Trial internal lining assessment and development of small diameter pipelines.	-0.01
Investment Prioritisation in Distribution Systems	0.04
Technologies and Strategies to Reduce Gas leakage expenditure Profile	0.06
IGEM Biogas	0.00
Internal Stress Corrosion Cracking (ISCC) assessment work	0.00
Long term demand forecasting for peak days	0.08
Soil and ground water Remediation technologies for Gas works and Gas Holder sites	0.03
Acoustek	0.02
Customer Self Isolation & restoration	0.01
Ductile Iron Window Cutter Tool	0.08
Iron mains condition assessment system Phase 3	0.75
Project Future Wave	0.13
Intelligent CO monitors	0.04
Multi-Occupancy Building Cured IN-Place Lining (Nu Flow)	0.01
Orbis Oxifree (TM198) Corrosion Coating	0.01
Multi-Occupancy Building Cured IN-Place Lining (HTC Serline)	0.01
Smarter Network Control	-
Treatment and Re-use of gasholder sludge	0.23
Development of Gas Industry Specification for Polymeric Pipe Line and Systems for Multi Occ Buildings	-
Total Gross Costs	1.59
3rd party income / contribution received	0
Total Net Costs	1.59

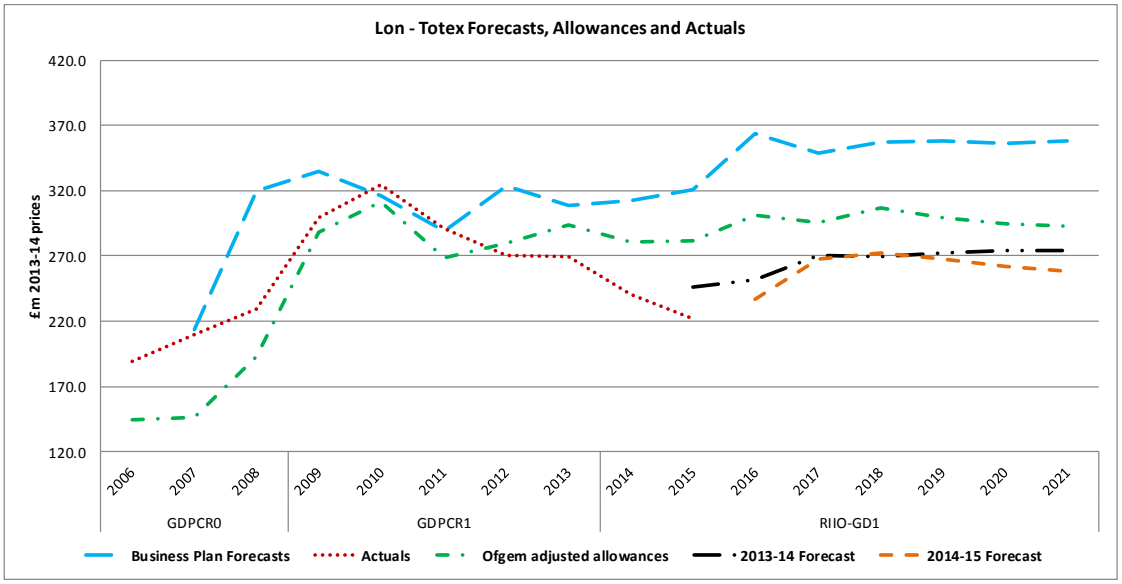
Appendix 8 – RIIO-GD1 controllable totex trends and performance

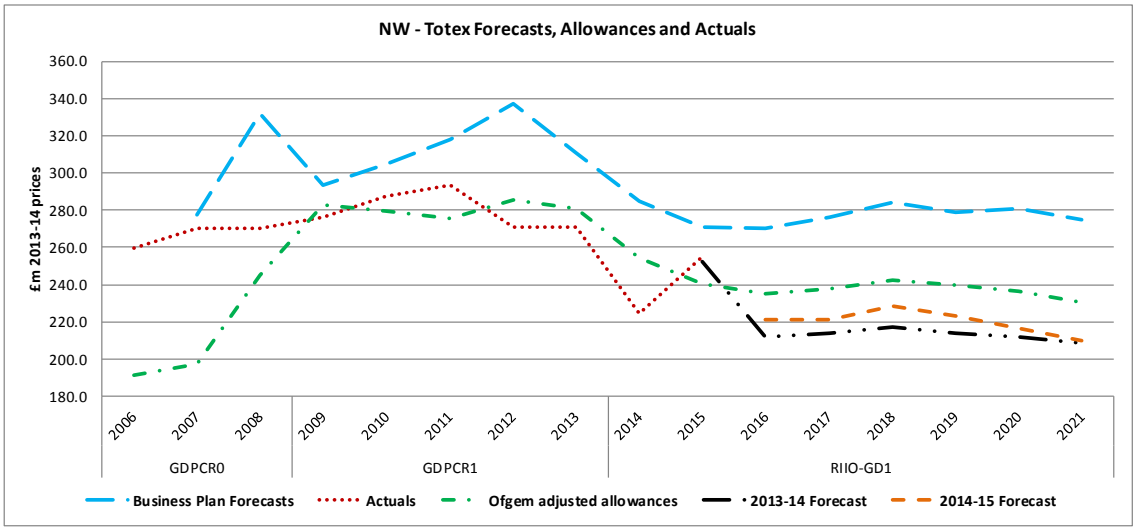
1.1. Requested, allowed and actual expenditure is put into context by comparing this expenditure with historical levels. The graphs below show the investment at GDN level that was allowed and required following network sales in 2005. Since 2011, totex has fallen across all GDNs and is forecast to remain stable throughout the remainder of the RIIO-GD1 period.

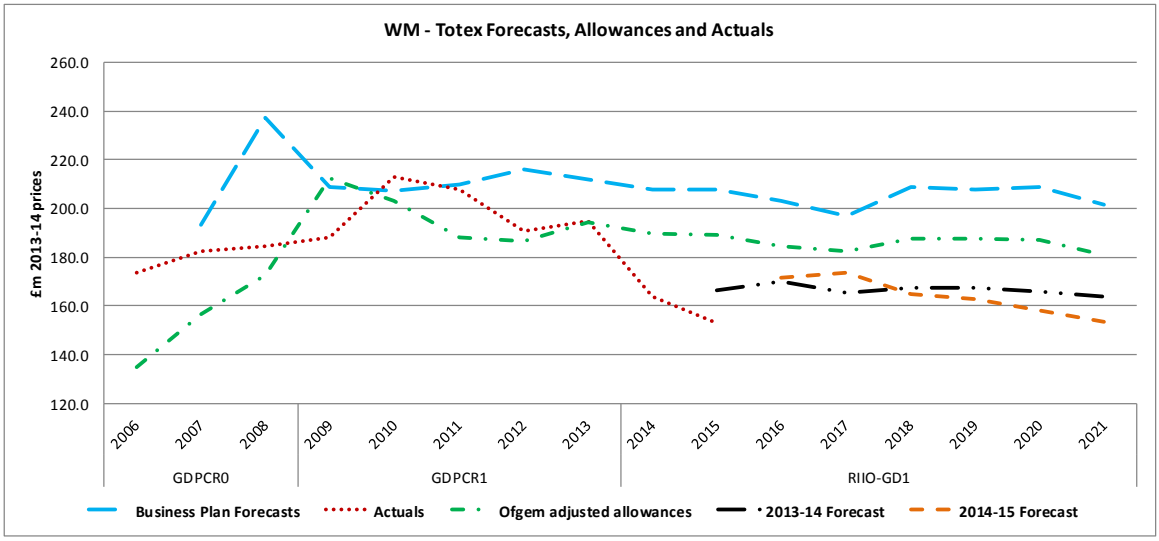
Figure 8.1: Controllable totex forecasts, adjusted allowances[67] and actuals trends by individual GDN

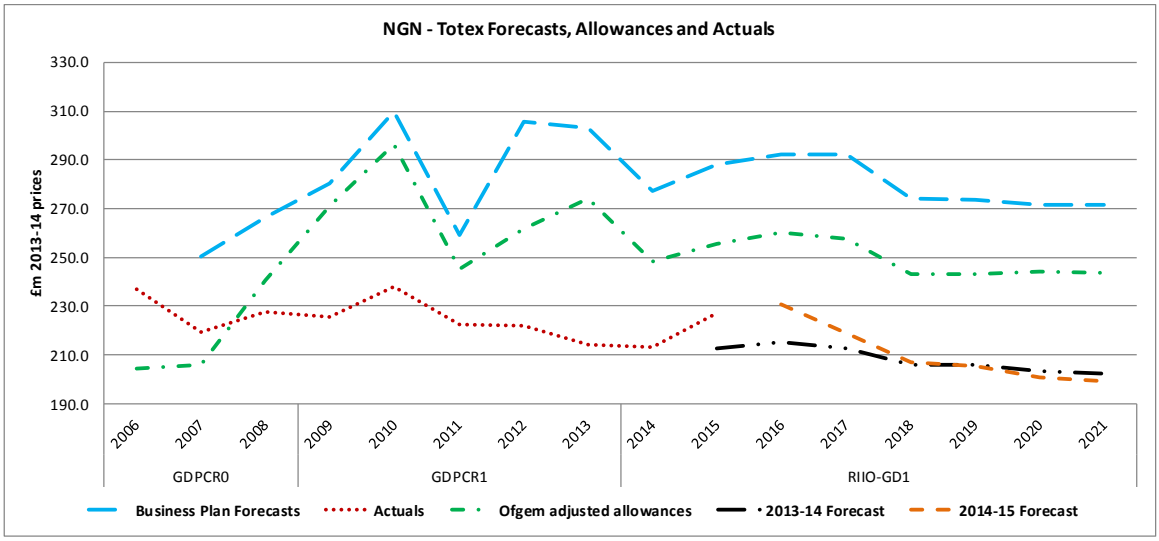


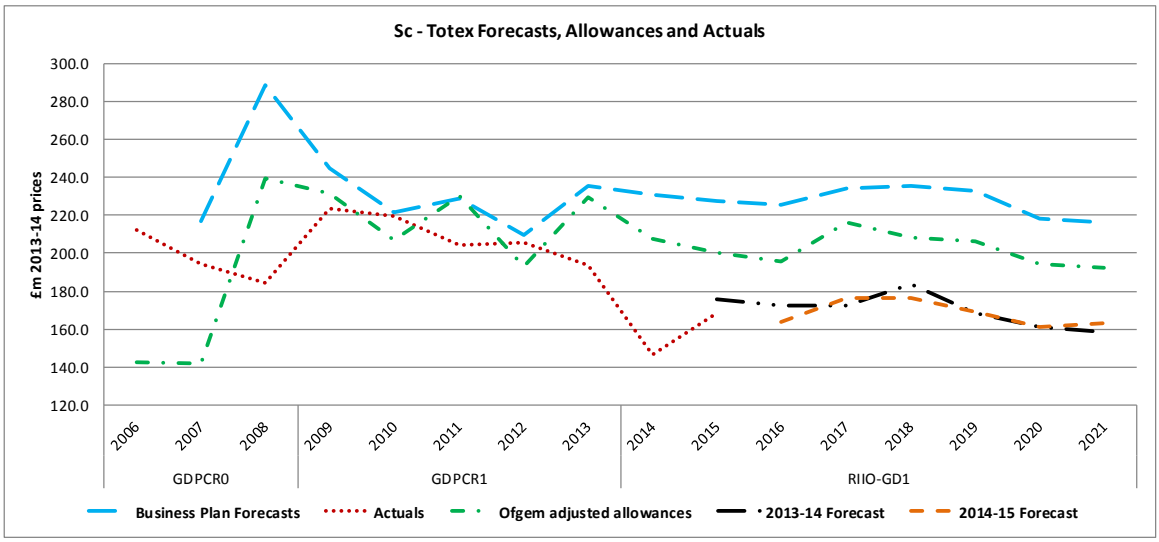
[67] We measure performance against the adjusted allowances of £17.2 billion, which is made up of the original £17.1 billion allowed for the eight-year price control period plus an additional £140 million of costs agreed in September 2015 (£122m as part of the pre-set RIIO Uncertainty Mechanism process and £18 million as part of the Fuel Poor Network Extension Scheme review).

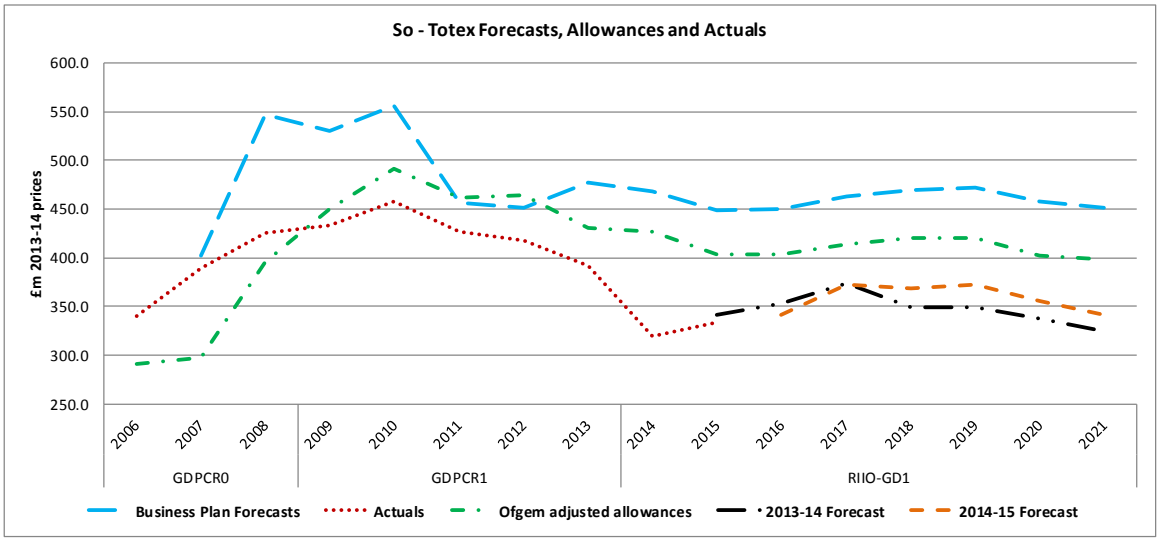

Lon - Totex Forecasts, Allowances and Actuals
£m 2013-14 prices
420.0
370.0
320.0
270.0
220.0
170.0
120.0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
GDPCR0
GDPCR1
RIIO-GD1
Business Plan Forecasts
Actuals
Ofgem adjusted allowances
2013-14 Forecast
2014-15 Forecast

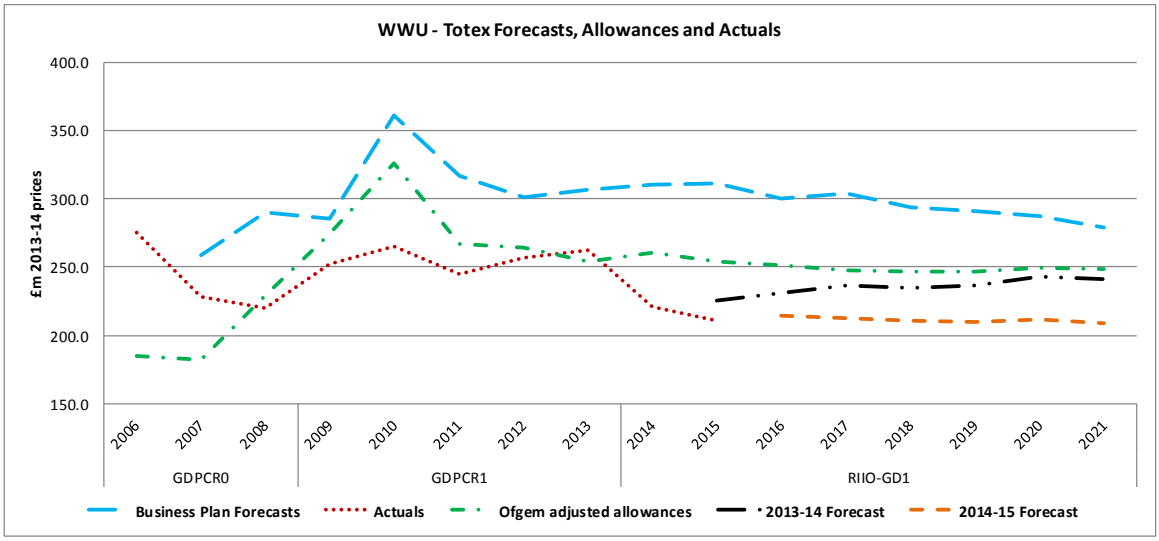

NW - Totex Forecasts, Allowances and Actuals
£m 2013-14 prices
360.0
340.0
320.0
300.0
280.0
260.0
240.0
220.0
200.0
180.0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
GDPCR0
GDPCR1
RIIO-GD1
Business Plan Forecasts
Actuals
Ofgem adjusted allowances
2013-14 Forecast
2014-15 Forecast


WM - Totex Forecasts, Allowances and Actuals
£m 2013-14 prices
260.0
240.0
220.0
200.0
180.0
160.0
140.0
120.0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
GDPCR0
GDPCR1
RIIO-GD1
Business Plan Forecasts
Actuals
Ofgem adjusted allowances
2013-14 Forecast
2014-15 Forecast


NGN - Totex Forecasts, Allowances and Actuals
£m 2013-14 prices
330.0
310.0
290.0
270.0
250.0
230.0
210.0
190.0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
GDPCR0
GDPCR1
RIIO-GD1
Business Plan Forecasts
Actuals
Ofgem adjusted allowances
2013-14 Forecast
2014-15 Forecast


Sc - Totex Forecasts, Allowances and Actuals
£m 2013-14 prices
300.0
280.0
260.0
240.0
220.0
200.0
180.0
160.0
140.0
120.0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
GDPCR0
GDPCR1
RIIO-GD1
Business Plan Forecasts
Actuals
Ofgem adjusted allowances
2013-14 Forecast
2014-15 Forecast


So - Totex Forecasts, Allowances and Actuals
£m 2013-14 prices
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
GDPCR0
GDPCR1
RIIO-GD1
Business Plan Forecasts
Actuals
Ofgem adjusted allowances
2013-14 Forecast
2014-15 Forecast


WWU - Totex Forecasts, Allowances and Actuals
£m 2013-14 prices
400.0
350.0
300.0
250.0
200.0
150.0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
GDPCR0
GDPCR1
RIIO-GD1
Business Plan Forecasts
Actuals
Ofgem adjusted allowances
2013-14 Forecast
2014-15 Forecast