RIIO-GD1

Year 1 Report

July 2014

Northern Gas Networks

I'm very pleased to report that NGN has performed extremely well, meeting or exceeding many of our key targets for the first year of RIIO. I'm particularly pleased to report that 2013/14 was a fantastic year for customer service. We finished the year in the industry top spot for satisfaction. It's been a company-wide effort: from our call handlers working to resolve complaints more quickly; the professionalism of our engineers around the region; the trailblazing efforts of colleagues in connections and the many back office colleagues who have played their part. In the year ahead we will be seeking to maintain our top ranking by continuing to put our customers first in everything we do and challenge ourselves against the best performers outside of the utility sector.

For many years NGN has benchmarked as the most efficient gas distribution network and RIIO pushes us to drive for further efficiencies which are shared with our customers. We continue to modernise our workforce, grow our direct service provider model and re-engineer our approach to capital investment. The results of these and a range of other initiatives has seen us deliver significant savings against our allowances which will result in thirteen million pounds being returned to our customers.

It is critical under RIIO that as well as driving efficiency we deliver the outputs required across safety, reliability, customer, environment, connections and social obligations. There are 51 commitments in total and I am delighted we've beaten lots of our key targets, and came close with others. Our focus on output delivery will continue to be relentless.

This first year report on RIIO contains lots of detailed technical information on our business and our forecasts for the future. It is a report submitted to our regulator Ofgem but as we did with our RIIO business plan we are making the same information available to all our stakeholders by making this report publically available. As a network operator we recognise the importance of transparency in all our operations.

Mark Horsley, CEO, Northern Gas Networks

Contents

1	**Executive Summary**	**7**
1.1	Introduction	8
1.2	Key facts about NGN	9
1.3	Revenue and customer bills	10
1.4	Totex expenditure	12
1.5	Outputs	14
2	**Outputs**	**17**
2.1	Introduction	18
2.2	Safety Outputs	19
2.3	Reliability Outputs	37
2.4	Customer Service Outputs	47
2.5	Environment Outputs	52
2.6	Social Obligation Outputs	61
2.7	Connections Outputs	66
3	**Innovation**	**71**
3.1	Introduction	72
3.2	Network Innovation Allowance	73
3.3	Network Innovation Competition (NIC)	80
3.4	Innovation Roll-out Mechanism	81
4	**Costs, Workloads and Uncertainties**	**83**
4.1	Introduction	84
4.2	Performance Improvement and Efficiencies	85
4.3	Operating Expenditure and Workload	92
4.4	Replacement Expenditure and Workload	100
4.5	Capital Expenditure	103
4.6	Uncertainties	109
5	**Revenue, Incentives and Customer Bills**	**113**
5.1.	Introduction	114
5.2.	Customer Bill Impact	115
5.3.	Incentive Income / Penalties	121
5.4.	Return of Regulatory Equity (RORE)	123

Executive Summary

1

1.1 Introduction

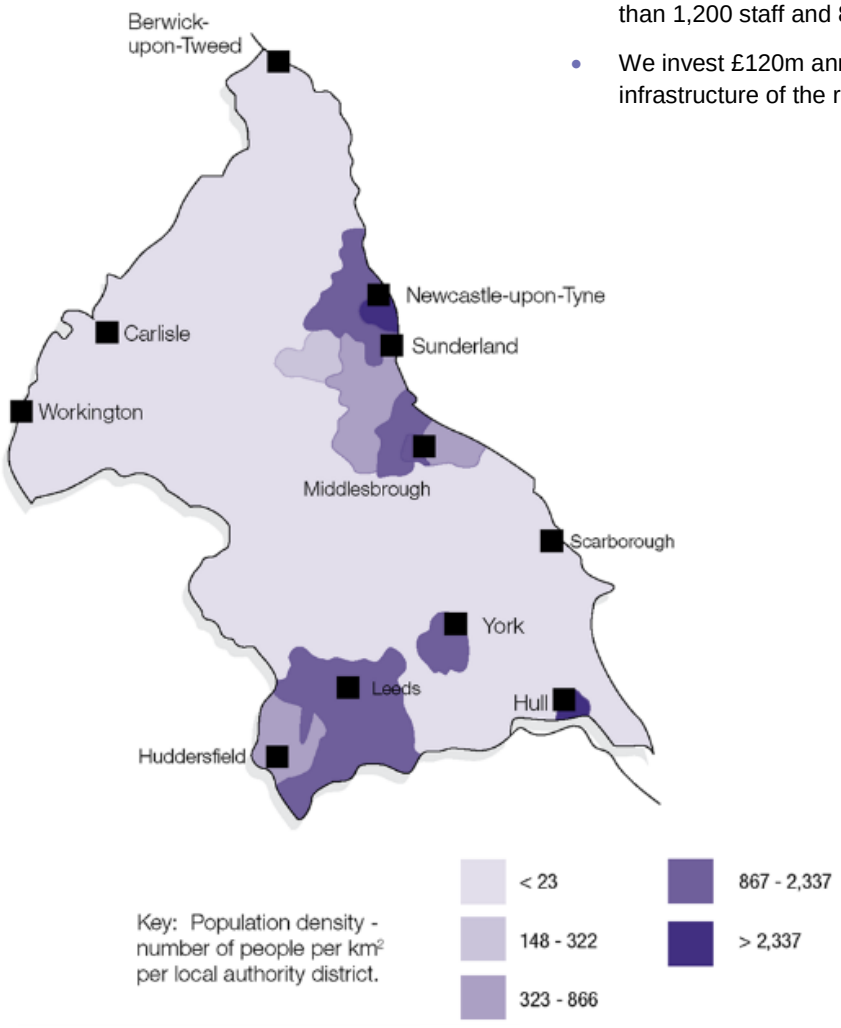
Gas distribution was the first sector in the energy industry to have a periodic review of its prices carried out under the new RIIO principles. This new price control applies for the eight year period from 1 April 2013 to 31 March 2021 and is referred to as RIIO-GD1. RIIO has provided the Gas Distribution Networks (GDN) with extra challenges and opportunities to deliver for our customers. We have adapted our network operating model and vision in order to meet these challenges, and will continue to do so.

We have now successfully completed the first year of operations under RIIO and are well on the way to delivering the key outputs and deliverables we committed to in our business plan and when accepting the outcome of the price control. Northern Gas Networks (NGN) has been the most efficient gas distribution network, evidenced by the financial benchmarking of the eight GDNs since 2005/06. We are looking to maintain this position whilst operating a safe and reliable network and delivering on our customer commitments.

1.2 Key facts about NGN

NGN is the licenced gas transporter for the North of England. We are responsible for the safe and efficient delivery of gas to homes and businesses in West, East and North Yorkshire, the North East and northern Cumbria.

- Our network:
  - Has 37,000km of pipeline
  - Covers 24,000km^2
  - Serves 2.7 million customers
- 50% of our customers are located in two of the largest conurbations in the UK.
- The remainder are in sparsely populated rural areas taking in four national parks.
- Our network transports 82,000 GWh of energy annually.
- We are a significant regional employer with a highly skilled workforce of more than 1,200 staff and 800 contractors.
- We invest £120m annually in the infrastructure of the region.



1.3 Revenue and customer bills

The total amount of revenue we can collect each year is calculated in line with the terms of our licence. Under RIIO there is a new annual update process that updates our revenues every year to reflect the latest data on our costs and performance under the various incentive schemes. These adjustments feed through to our allowed revenues and therefore customer bills with a two year lag to give gas shippers and other stakeholders advance notice of any changes.

The table below contains our latest forecasts of all of the revenue adjustments from the base revenues set out in our licence, through to final collected revenue.

13/14 prices (£m)	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	RIIO Total	Avg year
Base revenue	396	397	408	395	386	389	392	398	**3,161**	**395**
Income 'given back'										
1. Cost of debt IBOXX Index	0.0	(2.3)	(4.2)	(5.5)	(6.3)	(7.1)	(8.6)	(11.6)	**(45.7)**	**(5.7)**
2. Totex incentive Mechanism	0.0	0.0	(2.6)	(2.5)	(6.0)	(5.0)	(2.7)	(2.1)	**(20.9)**	**(2.6)**
3. Pensions deficit	0.0	0.0	(0.4)	(0.4)	(0.4)	(1.9)	(1.9)	(1.9)	**(7.1)**	**(0.9)**
4. Cost pass through true-ups	0.1	0.0	(6.2)	(6.8)	(6.3)	(5.2)	(1.9)	(2.6)	**(28.8)**	**(3.6)**
5. Over collection of income (K)	(3.1)	0.0	(3.0)	(0.5)	(0.0)	0.0	(0.0)	0.0	**(6.6)**	**(0.8)**
Total 'given back'	**(3.0)**	**(2.3)**	**(16.4)**	**(15.9)**	**(19.1)**	**(19.2)**	**(15.1)**	**(18.1)**	**(109.1)**	**(13.6)**
Incentive income										
1. Carry over from GDPCR1	0.0	3.4	1.3	1.5	1.7	1.9	2.1	2.4	**14.3**	**1.8**
2. Customer service	0.0	0.0	1.7	1.8	2.0	1.9	1.9	1.9	**11.3**	**1.4**
3. Shrinkage and environmental emissions	0.0	0.0	2.6	3.4	3.5	3.5	3.6	3.6	**20.1**	**2.5**
4. Exit capacity	0.0	0.0	0.0	0.6	0.7	0.3	0.2	0.2	**2.1**	**0.3**
5. DRS (11/12 and 12/13 monies)	1.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	**1.9**	**0.2**
6. NIA (0.63% of revenue by 15/16)	1.2	1.8	2.5	2.4	2.4	2.4	2.4	2.4	**17.5**	**2.2**
Total incentives	**2.3**	**6.0**	**8.2**	**9.8**	**10.2**	**10.0**	**10.2**	**10.5**	**67.2**	**8.4**
Total revenue (£m)	**395**	**401**	**400**	**389**	**377**	**380**	**387**	**390**	**3,120**	**390**

Figure 1.1: Revenue forecasts

On average, base revenue in 2013/14 prices is £395m over the eight year period, prior to any adjustments.

We are forecasting £13.6m average annual revenue reductions via the adjustment process. The key variances are:

- £5.7m average reduction as a result of our forecasts for the cost of debt (IBOXX index) reducing over the period;
- £3.6m average reduction as a result of pass through costs decreasing, largely driven by lower gas prices; and
- £2.6m average reduction as a result of outperformance against the Totex cost allowances, covering Opex, Capex and Repex.

Offsetting this we are forecasting £8.4m of average annual revenue increases, largely as a result of incentives contained within the RIIO principles. The key variances are:

- £2.5m average incentive earned under the shrinkage and environmental emissions incentive;
- £1.4m average incentive earned under the customer service incentive; and
- An average of £2.2m spent on innovative projects to benefit NGN, the wider gas industry and our customers.

In terms of customer bills, the following table summarises how the revenue above will impact the average domestic customer.

13/14 prices	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	Avg year
Revenue (£m)	391	395	401	400	389	377	380	387	390	**390**
Average Customer Bill (£)	131	130	130	130	126	122	123	124	125	**126**

Figure 1.2: NGN element of average domestic customer bill forecasts

In real terms we forecast that the NGN component of the average domestic customer bill will be flat for the next two years and then reduce over the remaining RIIO period. Underlying this forecast is a reduction in customer demand resulting in an increase in unit charges.

1.4 Totex expenditure

The table below summarises our actual and forecast performance against the Totex allowances. It is important to remember that the allowances were set by benchmarking all the gas networks, and we have historically been assessed as the most efficient GDN.

13/14 prices (£m)	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	RIIO total
Controllable Opex									
Allowance	96.8	97.9	98.3	98.5	96.8	96.6	96.4	95.4	**776.7**
Actual / forecast expenditure	80.5	81.8	80.7	80.6	79.7	79.0	78.9	78.4	**639.5**
Variance	(16.3)	(16.1)	(17.7)	(17.9)	(17.1)	(17.6)	(17.5)	(17.0)	**(137.1)**
Capex									
Allowance	51.4	55.5	58.6	54.5	41.6	42.1	42.0	42.7	**388.3**
Actual / forecast expenditure	40.3	43.0	49.7	49.6	43.9	45.1	45.8	45.9	**363.3**
Variance	(11.2)	(12.4)	(8.8)	(4.9)	2.3	3.0	3.8	3.2	**(25.0)**
Repex									
Allowance	96.9	98.7	98.0	99.0	99.5	99.4	100.4	100.2	**792.0**
Actual / forecast expenditure	88.3	83.7	80.6	78.3	78.2	78.1	74.7	74.2	**636.0**
Variance	(8.6)	(15.0)	(17.4)	(20.7)	(21.3)	(21.3)	(25.7)	(26.0)	**(156.0)**
Totex									
Allowance	245	252	255	252	238	238	239	238	**1,957**
Actual / forecast expenditure	209	209	211	209	202	202	199	199	**1,639**
Variance	36	44	44	44	36	36	39	40	**318**

Figure 1.3: Totex actuals and forecasts

Overall we have outperformed the allowances by £36m in 2013/14. This efficiency saving will be shared with our customers through the Totex incentive mechanism. Customers will receive 36% (£13m) of this saving through reductions in our allowed revenues.

Controllable Opex outperformance reflects strong cost control in this area and is largely driven by reduced emergency and repair costs. Whilst the mild winter supported this and reduced some workload, this was offset by a significant increase in water ingress due to the extremely wet weather experienced.

We have delivered some significant efficiency improvements during the year including improved management of street works costs, as well as revised terms and conditions for the existing workforce and new market driven terms and conditions for new starters – which introduced 'site start' and 'site finish' working and new bonus arrangements.

We expect our controllable Opex costs to increase by £1.3m in 2014/15 because:

- 2013/14 includes a £2.3m contractual rebate payment from National Grid for call handling services, and a £0.7m facilities rebate, both of which will not reoccur; and
- 2013/14 includes £0.7m for the demolition of one gasholder. We are forecasting the number of gasholders demolished to double in 2014/15, and increase to a total of five demolitions in 2020/21 at a cost of £2.9m, a £2.2m increase.

However, we are forecasting year on year reductions in our controllable Opex after 2014/15 due to the enduring efficiency improvements we have made and despite the increase in costs from the gasholder demolition programme.

Capex outperformance is partially driven by a revised approach to investment, which has also impacted the timing of projects. We have reengineered our investment approach and are targeting synergies and efficiencies across both activity area and geographic location. This increased commercial approach enables us to deliver work packages more efficiently, but has in a few cases introduced longer lead times for major projects compared to our original business plan forecasts. This is the primary driver for the year on year forecasts in figure 1.3.

In 2013/14 it has specifically reduced expenditure for major projects and plant and equipment. We have also experienced reduced expenditure in reinforcement, driven by reduced economic activity. Looking forward we expect our investment level to increase from 2013/14, particularly in the period up to 2016/17, and then reduce slightly.

Repex outperformance again reflects strong cost control in this area, whilst we have also focused on removing higher diameter and more difficult to replace pipes in order to maximise benefits for stakeholders and customers.

Whilst this workload suggests we should have seen higher unit costs overall, we have increased the use of direct contracts with smaller locally based contractors, rather than using larger intermediary contractors. This both removes the profit margin of the intermediary and allows NGN greater control of the end to end Repex process. We are forecasting further efficiencies from this revised commercial approach in future years.

1.5 Outputs

Under RIIO it is essential we deliver the required outputs for customers. In 2013/14 the expenditure outperformance detailed above has been achieved whilst maintaining our focus on delivering the outputs we committed to in our business plan. Our outputs are organised into six key areas.

Safety outputs ensure we provide a safe network for our customers and maintain this through well justified investment plans. In 2013/14 we delivered an excellent performance, especially in the area of mains replacement risk removed and emergency response where we delivered well in excess of our output targets. The key highlights are:

- Mains replacement – our mains replacement programme removed a total of 494.2km of 'at risk' pipes, which exceeded the target set for replacement under the control of the network. This removed 43,119 of risk, against an annualised target of 13,898. This reflects our strategy of removing the highest risk pipes, as detailed above;
- Emergency response – our emergency response teams are required to respond to uncontrolled and controlled gas escapes within 1 and 2 hours respectively – we exceeded these targets achieving nearly 100% in both categories;
- Repair – we achieved our annual risk repair score target, improving our performance in comparison to 2012/13. We also completed 62.3% of repairs in less than 12 hours, also outperforming the RIIO output target; and
- Accident prevention – we were fully compliant with all defined regulations in this area and removed risk from the targeted sub-deduct networks.

Reliability outputs ensure we maintain the network in line with long term plans and minimise the impact on the customer of any interruption in supply. In 2013/14 we performed well against our output targets, particularly in reducing the duration of interruptions. This, and other key highlights include:

- Interruptions – we achieved our targets to reduce the duration of both planned and unplanned interruptions, which have a major impact on our customers. We narrowly underperformed against our target for unplanned interruptions, but our performance is an improvement on prior years. We have plans in place to further improve performance in this area as well as in planned interruptions, where we did hit our target; and
- Gasholder decommissioning – we achieved our target of decommissioning one gasholder in 2013/14.

Customer service outputs ensure we improve levels of customer satisfaction from the activities we carry out and effectively manage stakeholder engagement. We have achieved excellent performance here, outperforming our targets and ranking first in the industry for customer satisfaction. In 2013/14 this, and other key highlights include:

- Customer satisfaction surveys – we significantly increased our scores in each of the three categories in comparison to previous performance, achieving a £1.8m incentive payment as a result, out of a maximum payment of £2m;
- Complaints metric – we focused heavily on improving the management of complaints, reducing numbers overall and as a result, received no penalty; and
- Stakeholder engagement – we expanded our high quality stakeholder engagement programme and indications are we will receive an extremely positive result from the annual independent panel review of our stakeholder engagement.

Environmental outputs ensure we work to reduce the environmental impacts of gas distribution. We have performed well in this output, in particular the area of shrinkage and environmental emissions. In 2013/14 key highlights include:

- Shrinkage – we have reduced the volume of both shrinkage and environmental emissions over and above our targets. This is as a direct result of our targeted replacement programme, proactive management of our system pressures and the use of a gas agent to saturate and swell joints that leak; and
- Broad measure – to support the connections of new gas plant – we have established arrangements to support customers who want to inject gas into the network and actively engaged with several interested parties. We expect to have one connection complete in the next year.

Social obligations outputs aim to ensure we help alleviate fuel poverty and improve the awareness of the risks of carbon monoxide. Although we were behind our target this year, we view our performance against our fuel poor output as satisfactory, mainly due to the abolition of the previous government funding schemes in this area. However, we have performed well against the other outputs. The key highlights for 2013/14 include:

- Fuel poor – we have successfully connected 1,164 fuel poor customers to our network, and have many more projects actively under review;
- Carbon monoxide – we are well on the way to providing all of our field engineers with CO detection equipment, with over 1,000 already in use. We expect full roll-out to be complete in the next year; and
- Social issues – we recognise this is an important area of responsibility for us as a key employer and service provider in the North of England and have appointed a Head of Social Strategy to coordinate all of our activities in this area.

Connections outputs aim to ensure we provide an efficient and effective service to customers wanting to connect to the gas network. In 2013/14 we have achieved a very high success rate in all seven categories monitored, well above our licence obligations and improving on last year. We view this as a good performance, however we have not quite achieved our own very challenging targets in four of these categories, but have plans in place to improve on our performance next year.

Our expenditure forecasts detailed in section 1.4 show continued outperformance against the allowances and increased efficiency going forward. This is not at the expense of our outputs. We expect to improve outputs performance over RIIO-GD1 in all areas, and in particular expect to be well ahead of several outputs. These include emergency and repair, risk removed and all of our customer service outputs. We are expecting to be back on track to deliver our commitments to deliver fuel poor connections within the next two years. We plan to be fully compliant with this and all other outputs at the end of RIIO-GD1.


HUNTERS
Northern Gas Networks
Northern Gas Networks

Outputs

2

2.1 Introduction

The adoption of an outputs based framework is a key element of the new RIIO framework. By defining the outputs companies need to deliver (e.g. risk-removed), instead of prescribing a set of inputs (e.g. length of mains abandoned), the framework provides incentives for companies to innovate and deliver the services that customers require at least cost. An outputs based framework also provides greater transparency for customers in relation to the services companies need to deliver.

This section sets out the outputs NGN is required to deliver during RIIO-GD1, our progress against these targets for 2013/14 and our forecasts for the next seven years.

The outputs cover six areas:

Safety - Minimising the risks associated with operating the gas distribution network for our stakeholders and society.

Reliability - Improving the reliability of our network with the optimum level of expenditure.

Customer Service - Improving the service we offer customers by engaging with them fully so their views direct the way we operate our business.

Environment - Reducing the environmental impacts of gas distribution.

Social Obligations - Helping to alleviate fuel poverty and actively addressing the concerns and risks of carbon monoxide poisoning.

Connections - Providing a high quality connections service for both entry and exit customers.

Outputs are classified as primary (or principal) outputs and secondary deliverables. In theory the secondary deliverables were designed to measure performance against the primary outputs. However, this distinction is blurred and does not hold true in all cases. It is far simpler therefore to consider both the primary outputs and the secondary deliverables as a single set of outputs that NGN must deliver for our customers. There are 51 in total.

2.2 Safety Outputs

The aim of the safety output measures is to ensure the provision of a safe network in compliance with HSE safety standards and improve asset knowledge to ensure GDNs develop well justified investment plans. The table below shows the safety output RIIO targets and our performance during 2013/14.

	RIIO-GD1 Year 1 target	13/14	RAG
Mains replacement			
Risk removed (incidents/year x10^{-6}) as measured by MPRS	13,898	43,119	G
Number of Gas in Buildings (GIB) events	144	56	G
Number of fractures and corrosion failures	2,730	815	G
Length of main taken 'off-risk'(km) (funded)	483.6	490.4	G
Length of main taken 'off-risk'(km) (customer driven)	15.4	3.8	A
Number of non-PE services replaced	30,932	25,689	A
Asset health and risk metrics	*Phased plan*	*On target*	G
Emergency response			
97% of uncontrolled gas escapes attended within 1 hr	97%	99.85%	G
97% of controlled gas escapes attended within 2 hrs	97%	99.97%	G
Repair			
Annual repair risk	<34,495,899	34,357,029	G
Percentage of repairs completed with 12 hrs	60.0%	62.3%	G
Major accident hazard prevention (MAHP)			
Compliance with the Control of Major Accident Hazards regulations (number of breaches)	0	0	G
Compliance with the Gas Safety (Management) Regulations (GS(M)R) (number of breaches)	0	0	G
Sub-deduct networks 'off-risk' by the end of RIIO	9	9	G

Figure 2.1: Safety outputs 2013/14 performance

We have made an excellent start to the delivery of our safety outputs. More detail and explanation on each individual measure can be found in the following sections, together with our forecasts for the whole RIIO period.

2.2.1 Mains replacement

In May 2012 the HSE issued a new enforcement policy on iron mains risk reduction. Under the old policy, the HSE required NGN and the other GDNs to replace all iron mains within 30 metres of buildings within 30 years ('30/30' programme). The new policy is referred to as the 'Three-Tier Approach' and enables NGN to consider factors other than the safety risk in determining which pipes to prioritise for replacement.

The rules for each tier are:

- **Tier 1 Mains** (pipes with a diameter of 8 inches or less), under the new policy NGN must still achieve full decommissioning by 31st 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, as well as improvements in safety risk;
- **Tier 2 Mains** (pipes of greater than 8 inches and less than 18 inches in diameter), all mains exceeding a defined risk action threshold must, by 31st March 2021, be abandoned, remediated or assessed for continued safe use (Tier 2a Mains). Pipes in tier 2 scoring below the risk-action threshold may be decommissioned where this is justified in cost benefit terms (Tier 2b Mains); and
- **Tier 3 Mains** (pipes with a diameter of 18 inches or above), in general, the new policy only requires GDNs to replace mains if the replacement is justified in cost benefit terms.

As set out clearly in our RIIO-GD1 Business Plan, 2013/14 represented the first full year of implementing our Iron Mains Replacement Programme strategy based on the principles of Total Network Management (TNM) and fully reflect this new 'Three-Tier Approach'. This strategy is focussed on fully utilising the additional flexibility afforded by these changes to innovate and improve mains replacement.

The successful implementation of this strategy in 2013/14 has enabled us to deliver a programme of replacement work that delivered on our year one targets whilst also delivering improvements in asset condition and performance that will drive benefits for the remainder of RIIO-GD1 and beyond. These benefits derive directly from the specific targeting of mains replacement as part of our approach to TNM. At the heart of this strategy is a cost benefit methodology to assess where the replacement programme will deliver maximum overall benefit when measured against a wide range of criteria.

During 2013/14 this approach has identified a range of issues that have required us to directly address the trade-off between maximising the benefit for customers from exceeding the output targets and maintaining frontier levels of productivity and efficiency.

This has resulted in a replacement programme in 2013/14 that included a work basket containing more challenging projects in terms of unit costs and duration, as well as customer and stakeholder impact during delivery. This programme delivered significant additional value for customers in terms of exceeding a number of the key RIIO-GD1 outputs during 2013/14, notably risk removal. The clear decision to 'front-load' the delivery of these benefits creates the opportunity to maximise the benefits across the whole RIIO-GD1 period.

NGN's performance around Mains Replacement during 2013/14 and forecasts for the remainder of the RIIO-GD1 period are detailed in Figure 2.2 below.

	RIIO year 1 target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Risk removed (incidents/year*10-6)	13,898	43,119	23,177	14,194	11,685	10,808	10,052	8,878	8,737
Length of main taken off-risk (km) (funded)	483.6	490.4	513.6	513.6	483.6	483.6	483.6	453.6	453.6
Length of main taken off-risk (km) (customer driven)	15.4	3.8	15.4	15.4	15.4	15.4	15.4	15.4	15.4
Number of GIB events	144	56	138	135	133	130	126	123	119
Number of fracture and corrosion failures	2,730	815	2,481	2,507	2,527	2,541	2,547	2,544	2,533
Number of non-PE services replaced	30,932	25,689	33,750	33,750	31,780	31,780	31,780	29,800	29,800

Figure 2.2: Mains replacement 2013/14 forecasts

We expect to deliver all our mains replacement safety outputs by the end of RIIO-GD1. The only exception may be the component of mains taken off-risk as a result of diversion work requested by customers which we do not control or initiate.

- **Risk removed (based on MPRS)**

For mains replacement, the primary output is the measure of risk removed from the network as a direct result of this activity. Every iron pipe within NGN's network has a risk score calculated by the MRPS system measured as incidents/year x 10^{-6}. This output is based on reducing the amount of risk over RIIO-GD1 and does not have formal year on year targets.

Forecast iron mains risk at beginning of RIIO-GD1 (incidents/year x 10^{-6})	276,341
Risk reduction target over RIIO-GD1	111,191
% risk reduction over RIIO-GD1	40%
2013/14 risk reduction achieved	43,119 (15.6%)

Figure 2.3: Iron mains risk reduction RIIO target

As outlined above, NGN has adopted a strategy of targeting replacement projects that maximise the delivery of outputs over the RIIO-GD1 period. As the main driver for the replacement programme and primary output in this category, risk removal is one of the key criteria used in determining the selection of mains for replacement within the programme.

Through this approach we have delivered a significant outperformance of the annualised risk removed target in 2013/14. The RIIO-GD1 output target is to achieve a reduction in overall risk of 111,191 over the eight year period which equates to an annual average target of 13,898 and represents a 40% reduction in risk over the period. The amount of risk removed in 2013/14 is 43,119, which represents 39% of the total eight year target and a 15.6% reduction in the total risk outstanding on NGN's network as measured at the start of 2013/14. This is a great start for year one.

During 2013/14 we have taken advantage of our new geographical clusters of pipes in order to reduce risk within our network and, whilst challenging to deliver, have seen real benefits, as can be seen in our outperformance of our annualised target. Outperformance is not anticipated to continue at this rate due to the obvious limitation of the network.

We expect that NGN's approach to TNM and the associated principles will remain a key element of NGN's overall strategy for the whole RIIO-GD1 period. As part of this, our mains replacement strategy will continue to employ the principle of targeted investment based on wide-ranging cost benefit analysis of individual projects under TNM. We will continue to develop and enhance our models and process used for project selection.

- **Number of Gas in Building Events (GIBs)**

Gas in Buildings (GIBs) is a measure of the number of gas escapes on a network pipe upstream of the Emergency Control Valve (ECV) which results in gas entering a building. Gas can enter the building in a number of ways – entering along the line of a service, having an open escape near property or an escape within the property. The output target is based on minimising the number of such events over RIIO-GD1 and does not have formal year on year targets.

	Maximum number of events (RIIO-GD1)	RIIO-GD1 year 1 target	13/14 actual number of events
GIB events (any concentration level)	1,153	114	56

Figure 2.4: GIB events 2013/14 performance

The number of GIB events during 2013/14 of 56 was well below the annualised target of 114, and in part, is a reflection of the targeted replacement programme. This performance reflects the further reductions seen during the year in both public reported escapes and the amount of repair work needed.

This is an excellent outcome, however, we recognise that other factors not in our control have contributed to this performance, notably a mild winter and favourable ground conditions.

These factors result in difficulties in identifying trends over time. Therefore there is a range of uncertainty around our forecasts.

The forecast performance is based on the trend of GIBs over an eleven year period against the forecast of the remaining length of live iron pipe each year. This provides a prudent assessment of the GIB events over the full RIIO-GD1 period taking into account both NGN's replacement programme and an assessment of the uncertainties driven by the exogenous factors highlighted above. We are forecasting 960 GIB incidents across the RIIO-GD1 period, which is a significant reduction in comparison to previous periods.

- **Number of fracture and corrosion failures**

The number of fracture and corrosion failures is the number of times these incidents occur on metallic gas mains. It is a key driver of gas escapes – the resultant release of gas can potentially lead to an incident. In a similar way to GIBs, fracture and corrosion failures can be influenced by factors beyond the replacement programme, such as change in temperature and ground conditions.

This is an excellent outcome, however, we recognise that other factors not in our control have contributed to this performance, notably a mild winter and favourable ground conditions.

	Maximum number of events (RIIO-GD1)	RIIO-GD1 year 1 target	13/14 actual number of events
Number of fractures / failures (C1/S1/D1) over RIIO-GD1	21,936	2,730	815

Figure 2.5: Fractures and corrosion failures 2013/14 performance

The number of fracture and corrosion failure events during 2013/14 of 815 was well below the annualised target of a maximum of 2,730 and as with GIB events, is a reflection of the targeted replacement programme. Again, an excellent outcome but we must recognise the contribution of factors outside our control.

The forecast performance for the remainder of RIIO-GD1 is based on the trend of fracture and corrosion failures over an eleven year period against the forecast of the remaining length of live iron pipe each year. This provides a prudent assessment over the full RIIO-GD1 period taking into account both NGN's replacement programme and an assessment of the uncertainties driven by the exogenous factors highlighted above. We are forecasting the number of fracture and corrosion failures of 18,495 across the whole RIIO-GD1 period which represents a forecast outperformance of 16% compared to the output target.

- **Length of main taken 'off-risk'**

This output measures the amount of iron main taken off-risk (abandoned) during RIIO-GD1. Any such main whether replaced as part of non-rechargeable diversion work, for condition reasons, for reasons driven by customer activity (e.g. rechargeable diversions) or for safety reasons count toward this measure.

The RIIO-GD1 target for the length of iron main taken of risk is 3991.9km over the full eight years which represents an average target of 499km per annum over the period. The table below illustrates the breakdown of these output targets across the three tiers of mains.

Type (km)	Allowed abandoned length	RIIO-GD1 year 1 target	13/14 actual abandoned length
Tier 1 abandoned (funded)	3584.0	448.0	453.9
Tier 1 abandoned (customer driven)	123.2	15.4	1.8
Tier 2a abandoned	81.5	10.2	8.8
Tier 2b abandoned	163.5	20.4	22.3
Tier 3 abandoned	40.0	5.0	7.5
Total	**3,991.9**	**499.0**	**494.2**

Figure 2.6: Length of iron main taken off-risk 2013/14 performance

Tier 1 Mains (pipes with a diameter of 8 inches or less) – the annualised abandonment target for Tier 1 iron mains is 463.4km per annum. This is made up of two elements:

- **448km** - The annual workload must be sufficient to meet the specified yearly workload agreed by the HSE for completion of the programme by 2032; and
- **15.4km** – Rechargeable diversion works driven by customer activity, not NGN. The majority of the costs for the work are recharged to the third party requesting the main to be diverted.

The table below sets out NGN's performance against these two elements of Tier 1 mains.

Type (km)	RIIO-GD1 year 1 target	13/14 actual abandonment length
Tier 1 iron mains abandoned (funded)	448.0	453.9
Tier 1 iron mains abandoned (rechargeable)	15.4	1.8

Figure 2.7: Tier 1 iron mains allowed abandonment 2013/14 performance

The table illustrates that the driver of the shortfall between targeted Tier 1 mains taken off-risk and actual abandonment lengths achieved in 2013/14 was the lower volumes of rechargeable works requested by customers within the year. As outlined above, this work is driven solely by customer requests and funded directly by those customers. As such NGN cannot control the volume of these diversions required either within year or across the RIIO-GD1 period.

Against the Tier 1 HSE Policy Mains target we achieved an outperformance of 3.9km in 2013/14. A good year one performance.

Our internal strategy for this category of iron mains is to accelerate the volumes of work in 2014/15 and 2015/16 to be a total of 60km ahead of the annualised RIIO-GD1 programme. The additional mains selected for replacement in this period will follow our targeted cost benefit approach and consequently deliver additional value for customers earlier than planned and provide a level of contingency against any delays to the full programme caused by issues such as severe winter conditions or major incidents.

Tier 2a Mains - (pipes of greater than 8 inches and less than 18 inches in diameter), all mains exceeding a defined risk action threshold must be abandoned, remediated or assessed for continued safe use within the RIIO-GD1 period.

The risk posed by each iron gas pipe is currently modelled via MRPS (the Mains Replacement Prioritisation System). For the RIIO-GD1 period, this corresponds to an MRPS score of 142.9 for NGN.

The table below sets out NGN's performance against the output targets for Tier 2a mains.

Type (km)	RIIO-GD1 year 1 target	13/14 actual abandonment length
Tier 2a iron mains abandoned	10.2	8.8

Figure 2.8: Tier 2a iron mains allowed abandonment 2013/14 performance

There is uncertainty as to the exact workload that may be generated by mains passing beyond the risk action threshold as a result of the dynamic nature of the iron pipe network and risk model enhancements. This was recognised in setting the RIIO-GD1 workload and financial allowances and a revenue driver was included to address this issue. Therefore if a GDN abandons more or less iron mains than assumed then the cost allowance will be adjusted accordingly.

Tier 2a workload allowances were set at 81.5km across the whole period. This was set on the basis of the anticipated population of pipe that would be above the risk threshold during RIIO-GD1 after allowing for dynamic growth over the period. Based on the current risk scores of Tier 2a pipes NGN had a population of 37.5km of pipe exceeding this threshold at the start of RIIO-GD1 but this will adjust through dynamic growth.

Therefore during 2013/14, NGN's workload was below the forecast 10.2km per annum on the basis of a reduced forecast of above threshold risk pipes over the period. However, the outcome of our year one programme resulted in a higher workload than implied by a simple average of the above threshold pipes and will deliver more benefits for customers earlier in the RIIO-GD1 period.

Tier 2b and 3 Mains –Tier 2b relates to pipes of greater than 8 inches and less than 18 inches in diameter that fall below the risk threshold. Tier 3 relates to pipes with a diameter of 18 inches or above. Iron mains in this category are non-mandatory and the new replacement policy only requires NGN to replace mains if the replacement is justified in cost benefit terms.

The table below sets out NGN's performance against the output targets for Tier 2b and 3 main.

Type (km)	RIIO-GD1 year 1 target	13/14 actual abandonment length
Tier 2b abandoned	20.4	22.3
Tier 3 abandoned	5.0	7.5
Total	**25.4**	**29.8**

Figure 2.9: Tier 2b and 3 iron mains allowed abandonment 2013/14 performance

NGN have fully deployed the cost benefit analysis set out in our RIIO-GD1 business plan to identify and design the mains replacement projects in this category. Whilst abandonment / replacement of these pipes will reduce the risk of an incident this is not necessarily the principal driver, as replacement will allow us to deliver a range of benefits that are significant in their own right. These include:

- Reduction in risk;
- Reduction in leakage (emissions);
- Reduction in reported escapes;
- Reduction in associated repairs; and
- Positive customer and stakeholder impact.

The cost benefit analysis is based upon a core set of assumptions:

- Evaluation period – 16 years (highlighting schemes that have a payback before the end of RIIO-GD2);
- Deterioration factor – a deterioration rate for individual pipes has been included of 4% per annum;
- Leakage – individual pipeline leakage rates derived from industry leakage model; and
- Evaluation criteria – individual pipeline schemes that show a positive NPV over a period up to 16 years (two price control periods) are included as schemes that should be progressed.

The workload volumes delivered in 2013/14 were ahead of the planned 25.4km in this category and represented those projects that delivered the highest NPV across all categories of condition based replacement for the relevant investment over the period. The forecast for the remainder of the RIIO-GD1 period is to continue to deliver an annual programme broadly in line with the 25.4km per annum as set out in the RIIO-GD1 business plan whilst focussing on delivering the highest value projects as early as possible within the overall programme to derive the maximum benefits over the period for our customers and stakeholders.

- **Number of non-PE services replaced**

This is the number of metallic services replaced during RIIO-GD1. These volumes include all services replaced as part of our activities:

- Services associated with the Iron Mains Replacement Programme;
- Stand-alone bulk-service renewal programmes;
- Relays after escapes; and
- Other services replacement categories.

The output target is based on achieving the total replacement volumes over RIIO-GD1 and does not have formal year on year targets.

	RIIO-GD1 8 year target	RIIO-GD1 year 1 target	13/14 actual number of non-PE services replaced
Number of non-PE domestic service replaced	247,458	30,932	25,689

Figure 2.10: Number of non-PE services replaced 2013/14 performance

The total number of non-PE services replaced during 2013/14 was 25,689.

The number of services replaced is primarily driven by the characteristics of the mains selected for replacement, (e.g. more rural locations have fewer services per km of main compared to urban locations). During 2013/14 replacement services associated with our programme have been lower due to the geographical location of workload during the year. The historic average underlying the RIIO output target is one service every 12.6m of iron main. This increased to one service every 13.2m of main in 2013/14. Our forecast for the remainder of RIIO is based upon the ratio of services to length of main abandoned delivered in previous years.

Where appropriate, NGN will continue with its strategy of adopting 'service-led' mains replacement. The asset condition and location in the network are taken into consideration as part of this strategy which delivers good returns in terms of service asset condition and performance in those selected networks. Propensity to drive down the number of reactive / unplanned service replacements carried out across the network is also increased.

Whilst recognising that there are a number of exogenous factors that can impact upon the performance of services assets, we believe that our adopted strategy has been one of the key factors that has impacted upon the reduction of unplanned service replacement jobs required in 2013/14. This lower than forecast number of unplanned service replacement jobs has meant that a smaller number of non-PE services have been replaced in 2013/14.

Although NGN's population of non-PE services is reducing, either proactively associated with mains replacement (as outlined above), reactively following escapes, or consequentially as a result of other works, the total number of escapes has remained largely constant.

As this is against a background of reducing stock, this indicates that the health of NGN's service population is deteriorating, and will continue to do so in the future.

We will review and adapt our approach to service replacement over the RIIO-GD1 period.

- **Asset health and risk metrics**

Asset health and criticality matrices provide a framework for collating information on the condition of networks assets and a measure of the consequence of asset failure. Developing these was a key step in setting up output based regulation. As part of this price control, we submitted an assessment of our assets at the start of RIIO-GD1, together with a forecast for the end of RIIO. Failure to deliver the expected improvements will result in financial penalties in RIIO-GD2. Importantly this is an eight year target.

We are on target to deliver improved asset health across the broad measure of assets. In 2013/14 we have focused on preparation. This has involved:

- Further risk assessing our assets;
- Identifying asset replacement vs. maintenance trade-offs;
- Identifying all mandatory work;
- Developing detailed designs for many asset improvements; and
- Ordering bespoke equipment.

Many assets are starting to benefit from our initial investment programmes. Apart from distribution mains and services the following categories have seen the biggest improvement:

Offtakes - Odorisation System

19 odorant controllers on 19 sites were replaced in 2013/14 resulting in a significant investment of £0.6m (see figure 4.3) and a health movement in the matrix from HI4 into HI1.

PRS - Electrical System and Instrumentation System

Eight PRS sites have had full electrical and instrumentation upgrades in 2013/14 resulting in a health movement from the HI4 and HI5 into HI1.

Governors

Nine district governors and 438 service governors were replaced in 2013/14 resulting in a health movement into the HI1 category.

We are currently progressing many major projects which will deliver significant improvement by the mid-point of RIIO-GD1. We expect to be fully compliant with this output target by the end of RIIO-GD1.

2.2.2 Emergency Response

- **97% of uncontrolled gas escapes attended within 1 hour**
- **97% of controlled gas escapes attended within 2 hours**

The primary outputs for emergency response are to attend 97% of uncontrolled gas escapes within one hour, and 97% of controlled gas escapes within two hours.

	RIIO annual target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
97% of uncontrolled gas escapes attended within 1hr	97%	99.85%	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%
97% of controlled gas escapes attended within 2hrs	97%	99.97%	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%

Figure 2.11: Emergency response forecasts

In 2013/14 we performed significantly above the targets – achieving 99.85% and 99.97% respectively. This excellent performance was driven by the detailed day to day focus of our area managers and their teams and proactively resourcing up our emergency response teams in the key winter period. We were also assisted by mild winter conditions.

We are currently planning our approach for winter 2014/15 and onwards, which will involve further targeted resourcing. We expect to outperform these targets in every year of RIIO-GD1.

2.2.3 Repair

The primary outputs for repair are to maintain, or reduce annual repair risk and to gradually improve our percentage of repairs completed within 12 hours.

	RIIO-GD1 year 1 target	13/14
Annual repair risk	<34,495,899	34,357,029
% repairs completed within 12hrs	60.0%	62.3%

Figure 2.12: Repair 2013/14 performance

- **Annual repair risk**

Annual repair risk is the total risk score associated with all pipes which require a repair, recorded on a daily basis and totalled over a year. The risk score is based on a range of criteria and is used to prioritise repair work. Our target for RIIO-GD1 is to maintain annual repair risk at the same, or below, the level that was achieved in 2012/13.

We have achieved this output in 2013/14, a satisfactory year one performance. During the year we have developed new management information to support the delivery of this output which is now provided to our area managers on a daily basis. This has enabled us to increase focus and management time on controlling our performance in this key area.

We expect to outperform this target every year during RIIO-GD1.

	RIIO annual target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Annual repair risk	<34,495,899	34,357,029	34,013,459	33,673,324	33,336,591	33,003,225	32,673,193	32,346,461	32,022,996

Figure 2.13: Annual repair risk forecast

- **Percentage of repairs completed within 12 hours**

We also have a requirement to complete repairs within 12 hours. We have committed to a gradual improvement in performance across RIIO-GD1. The table below details this target, and includes our forecast against this – we expect to outperform our targets in every year.

	RIIO annual target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
% repairs completed within 12hrs	60.0%	62.3%	60.25%	60.50%	60.75%	61.00%	61.50%	62.00%	62.50%

Figure 2.14: % repairs completed within 12 hour forecast

We achieved 62.3% in 2013/14 against a target of 60%. This excellent performance was achieved by proactively resourcing up our repair teams in the key winter period, and retraining and refocusing our resources on this output. The mild winter experienced also had a positive impact.

2.2.4 Major Accident Hazard Prevention

The existing safety requirements on NGN in relation to Major Accident Hazard Prevention are set out in legislation and monitored by the HSE. There are three outputs in this area. Two are related to compliance with legislation and the other relates to risk removal from sub-deduct networks.

As outlined in the table below, we are not forecasting any breach of legislation and expect to achieve our target in relation to sub-deduct risk removal.

	RIIO target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	Total
Compliance with the Control of Major Accident Hazards regulations (number of breaches)	0	0	0	0	0	0	0	0	0	0
Compliance with the Gas Safety (Management) Regulations (GS(M)R) (number of breaches)	0	0	0	0	0	0	0	0	0	0
Sub-deduct networks 'off-risk' by the end of RIIO (Complete)	134	9	91	6	6	6	6	6	4	134

Figure 2.15: Major accident hazards prevention forecast

- **Compliance with the Control of Major Accident Hazards Regulations (COMAH) (1999)**

This output requires NGN to demonstrate that it has fully complied with COMAH and set out the details of any non-compliance within the relevant year. It requires NGN to have a major accident prevention policy backed by a robust safety management system.

We have had no COMAH breaches in 2013/14. Our target is to have no breaches during RIIO-GD1.

We take our responsibilities with regards to COMAH very seriously. NGN has detailed policies and procedures in place to manage compliance.

In addition to this a number of measures are used to demonstrate compliance with COMAH including;

- External independent audit of COMAH sites;
- Internal audit also conduct periodic audits of our compliance process;
- Emergency plans are produced/reviewed and are placed on operational COMAH establishments;
- HSE notifications are recorded as part of compliance monitoring and output reporting;
- Emergency exercises are undertaken in line with NGN exercise programmes; and
- HSE site interventions also assist in the verification of COMAH compliance.

Our asset strategy and integrity team review the above detail on a quarterly basis and report compliance to the Asset Risk Management and Safety Director.

In addition, NGN has a storage strategy to reduce risk from the network by the removal of all low and high pressure storage holders. This eliminates the legislative requirement associated with gas storage, set out in the COMAH Regulations. The strategy also addresses the HSE concern of societal risk associated with operating such assets in close proximity to public dwellings.

- **Compliance with the Gas Safety (Management) Regulations (GS (M)R)**

This output requires NGN to demonstrate that it has fully complied with GS(M)R and the safety case required by this legislation. The culture of compliance with the safety case is embedded throughout NGN.

NGN's output target is to maintain full compliance with GS(M)R during RIIO-GD1. We have achieved this in 2013/14 and expect to in every year of RIIO-GD1.

- **Sub-deduct networks 'off-risk' by the end of RIIO GD1**

A sub deduct network is a network configuration which consists of a primary meter, pipes and one or more secondary meters. The owner and operator of these networks is not always clear, presenting a potential safety risk.

This risk can be removed by reengineering the pipes and meters, or by establishing that a third party formally accepts responsibility for them.

At the start of RIIO-GD1 there were an estimated 134 sub-deducts connected to our network. Our target is to remove the risk from these networks by the end of RIIO-GD1. We have achieved nine removals in 2013/14, and expect to remove the majority in the next two years using a risk based approach. The remainder will be phased over the rest of RIIO-GD1.

2.3 Reliability outputs

The aim of the reliability output measures is to promote a network capable of providing long term reliability, whilst adapting to climate change, as well as minimising the number and duration of interruptions.

	RIIO-GD1 year 1 target	13/14	RAG
Loss of supply			
Number of planned interruptions	50,698	43,276	G
Number of unplanned interruptions	8,408	11,464	R
Duration of planned interruptions (mins-millions of)	27.3	22.4	G
Duration of unplanned interruptions (mins-millions of)	7.8	4.8	G
Network capacity			
Meeting NGN's 1 in 20 planning standard (MWh pa)	512,701	500,315	G
PRI utilisation and capacity	*Phased plan*	*On target*	G
Network reliability – maintaining operational performance			
Percentage by volume of offtake meter errors	<0.1% pa	<0.002%	G
Number and duration of telemetered faults	211 pa	105	G
Pressure System Safety Regulation (PSSR) Faults (A1 and A2 faults per number of AGIs)	0.51 pa	0.43	G
Gasholder decommissioning	1	1	G

Figure 2.16: Reliability outputs 2013/14 performance

Our year one performance on reliability outputs has been good. Whilst we unfortunately had more unplanned interruptions than the target the actual length of time customers were without gas was significantly better than the target.

We expect with the exception of the number of unplanned interruptions to deliver all our reliability outputs, however, we will smash the target set for customer minutes lost. More detail on each individual measure can be found in the following sections together with our forecasts for the whole RIIO period.

2.3.1 Loss of supply

The loss of supply outputs cover our performance in relation to interruptions, which are classified in two ways:

- **Planned** – prior notification that the gas supply will be interrupted is provided to the customer, typically associated with work planned by NGN, such as mains replacement; and
- **Unplanned** – no prior notification is given to the customer. Causes include problems with our assets (upstream of the ECV), damage to assets by third parties, and water ingress.

The output targets are to keep the number and duration of planned and unplanned interruptions over the RIIO period below the levels set out in the table below. There are no formal year on year targets.

	RIIO target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	Total
Number of planned interruptions	405,585	43,276	45,000	45,000	42,000	42,000	42,000	39,000	39,000	337,226
Number of unplanned interruptions	67,263	11,464	11,500	11,000	10,500	10,000	9,500	9,000	8,500	81,464
Total number of interruptions	472,848	54,690	56,500	56,000	52,500	52,000	51,500	48,000	47,500	418,690
Duration of planned interruptions (mins-millions of)	218.46	22.4	24.4	24.2	22.7	22.6	22.5	20.8	20.7	180.3
Duration of unplanned interruptions (mins-millions of)	62.7	4.8	6.0	5.9	5.8	5.7	5.6	5.5	5.4	44.7
Total duration of interruptions	281.2	27.2	30.4	30.1	28.5	28.3	28.1	26.3	26.1	225.0

Figure 2.17: Loss of Supply forecasts

- **Number and duration of planned interruptions**

We had 43,276 planned interruptions in 2013/14, with a duration of 22.4mm. This is below our year one target and we are on track to outperform the eight year RIIO target, taking into account the volume and type of replacement workload carried out in each year.

Our year by year forecasts for RIIO takes into account the phased delivery plan for our replacement programme, which is the primary driver of planned interruptions. We are looking to further improve all aspects of the management and control of our replacement programme to minimise any project churn and hence impact on the customer. This will also support delivery of this output.

We are also investigating opportunities to use bottled/stored gas to further reduce the length of time customers are off-gas as a result of a planned interruption. For larger projects, there is potential to use innovative techniques to ensure customers experience no interruption to their gas supply.

- **Number and duration of unplanned interruptions**

We had 11,464 unplanned interruptions in 2013/14, with a duration of 4.8mm. This number of unplanned interruptions is an improvement on previous performance, although behind target. The target was set based on an assumption that the number of unplanned interruptions was directly in our control. However the causes and predictability of unplanned interruptions are diverse and random. Consequently they are much less within our direct control than assumed when the target was set.

However, the duration of unplanned interruptions for 2013/14 was ahead of expectations which minimises the impact on our customers. This reflects the increased focus we have placed on ensuring that supplies are restored as soon as possible, and the mild weather conditions.

Our forecasts for the remainder of RIIO are based on a more typical winter experience, with a targeted year on year improvement. We will deliver this by further embedding a customer focused management approach to unplanned interruptions. We operate a daily conference call to review, in detail, the outstanding position on all ‘open’ interruptions, which is attended by a cross section of operational managers and field operatives. These meetings have identified areas for improvement, such as training and equipment use, and embedding ownership of the customer, which has increased focus on the management of interruptions.

We are also considering our approach and use of targeted bulk service renewals. The replacement programme itself should also drive reductions in unplanned interruptions.

We believe that we will not achieve the RIIO target for the number of unplanned interruptions, but will significantly reduce the duration of such interruptions and therefore significantly exceed our targets for reduction in customer minutes lost. It should be noted that network reliability in 2013/14 was 99.9997%.

2.3.2 Network capacity

- **Meeting NGNs 1 in 20 planning standard**

This output requires our network to have sufficient capacity to ensure that customers' demand for gas is not interrupted during periods of highest demand. Estimates of peak customer demand in 1 in 20 weather conditions have been falling since 2005 as a result of high energy prices, the economic downturn and increased energy efficiency.

Forecasts of peak demand are reviewed annually and are a primary influence on the modelling and capacity planning processes within NGN.

The demand forecasting process employs specific modelling techniques which identify the peak (1:20) demand over a period of ten years. This is used alongside our storage simulation model which identifies the peak storage requirements using historic demand and weather patterns over a 75 year period.

The table below includes our latest forecasts. We expect to be fully compliant with this output throughout RIIO-GD1.

	RIIO annual target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Meeting NGNs 1 in 20 planning standard (MWh pa)	512,701	500,315	498,911	497,041	495,097	493,051	490,976	488,864	487,023

Figure 2.18: Meeting NGNs 1 in 20 planning standard forecast

- **Asset utilisation and capacity outputs**

NTS offtakes enable gas to be taken from the National Grid system into NGN's high pressure pipe network. PRIs then enable onward transportation through the network to customers. To meet our supply obligations, both of these asset types need to be technically compliant and capable of meeting the required throughput volumes. If not, then we invest to upgrade or replace the asset.

Our output targets for improving the utilisation of our assets are outlined below.

Capacity utilisation	RIIO target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Utilisation < / =50%	51	51	51	50	49	49	49	48	47
Utilisation 50% < I <=70%	52	58	58	57	57	57	57	57	57
Utilisation 70% < I <=80%	45	25	25	29	34	35	36	37	38
Utilisation 80% < I <=100%	44	49	50	51	49	49	49	50	50
Utilisation > 100%	0	10	9	5	2	2	1	-	-

Figure 2.19: Asset utilisation and capacity forecasts

On an annual basis NGN undertake a full and detailed network analysis of all PRIs and Offtakes using our Prism and Graphical Falcon modelling tools. Aligning this work with our expected maximum flow data allows us to identify where specific site investment is required to maintain each unit within an acceptable utilisation band. This ensures we make the investment at the latest opportunity allowing us to avoid 'gold plating' of the system.

Our target is improve our asset utilisation position over RIIO-GD1. The table above shows our current forecast for this output. We will achieve this by designing two site upgrades per annum, which will then be completed the following year.

In 2013/14 we have delivered all our targeted detailed design work for the complex sites involved. In addition, two sites, Menston and Little Burden, have seen reduced capacity utilisation following updates to asset data and the closure of a large end user respectively.

2.3.3 Network Reliability

- **Maintaining operational performance**

The primary output associated with Network Reliability is maintaining levels of operational performance across the network. This will be measured by the four outputs outlined below.

	RIIO year 1 target	13/14	RAG
% by volume of offtake meter errors	<0.1%	<0.002%	G
Number of 'now' faults * duration in hrs / number of telemetered AGIs	211	105	G
Number of PSSR A1 and A2 faults per number of AGIs	0.51	0.43	G
Gasholder decommissioning	1	1	G

Figure 2.20: Network reliability 2013/14 performance

- **Percentage by volume of offtake meter errors**

NGN is responsible for measuring and reporting meter accuracy for the delivery of gas from the NTS into our network. This is measured through a process administered by the Joint Office of Gas Transporters, which requires the identification and reporting of potential meter errors as part of a measurement error notification process.

There is a common industry output target for RIIO-GD1 in relation to meter error of no greater than 0.1% of total throughput (measured in GWh).

	RIIO annual target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Offtake meter errors	<0.1%	<0.002%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%

Figure 2.21: Offtake meter errors forecast

All NGN's offtake metering systems have been assessed for accuracy and repeatability through the full flow range with results assessed to identify sites where the accuracy and reliability could be improved by introducing new technology. A program of metering upgrades has been developed to replace the old metering systems with the latest ultrasonic meters which are more efficient as they have a higher accuracy through the full flow range and require less maintenance.

Meter errors can take a significant period of time to progress through the process detailed above. Our current estimate for 2013/14 is a meter error of no more than 0.002%, well within the output target. We expect to be within target for every year of RIIO.

- **Number and duration of telemetered faults**

RIIO-GD1 includes output targets with respect to our response to telemetered faults on Above Ground Installations (AGI). This is measured as the average duration of 'now' faults per AGI.

NGN have an output target to reduce the number and duration of telemetered faults over the RIIO period as detailed in the table below.

	RIIO annual target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Number of 'now' faults * duration in hrs / number of telemetered AGIs	211	105	196	181	166	151	136	128	120

Figure 2.22: Telemetered faults forecast

In 2013/14 NGN experienced 105 faults against a RIIO target of 211. This excellent performance was driven by a focused effort by our system control and network maintenance functions to improve the performance of our assets. This was achieved by reviewing fault data through weekly reports, which drove the reduction and close out of faults quickly and efficiently.

Systems control and network maintenance functions also held monthly fault meetings to continuously identify further opportunities to reduce faults. This resulted in the development of a prioritised programme to remove equipment identified as at the end of asset life and replace it with new technology.

- **Pressure Systems Safety Regulations (PSSR) faults**

Statutory inspections are carried out on our above two bar network under the Pressure Systems Safety Regulations which can find faults.

Addressing PSSR faults allows us to limit the deterioration of network assets. Faults are reported by reliability categories, with A1 (imminent danger) being the most serious.

This output measure was not consistently defined across the GDNs, and so it has been agreed that all GDNs will move to a revised consistent approach.

	RIIO annual target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Number of PSSR A1 and A2 faults / number of AGIs	0.51	0.43	0.51	0.50	0.50	0.49	0.49	0.48	0.47

Figure 2.23: PSSR faults forecast

The RIIO target for the proposed new measure is <0.51 faults per inspection. We have achieved 0.43 faults per inspection in 2013/14, well below the target.

We have achieved this through a combination of targeted asset upgrades and maintenance, and robust monitoring and control of inspections and their recommendations. The target reduces year on year throughout RIIO, and we expect to outperform this target every year.

- **Gasholder decommissioning**

We currently have 47 low pressure gasholders at 35 sites on the network which are no longer required to operate the network.

We have a gasholder decommissioning programme that will reduce the risks associated with gas storage and the requirements set out in COMAH Regulations for managing gas storage assets.

The programme also removes a number of other requirements for inspection and maintenance and their associated risks in addition to the costs of maintaining such ageing assets.

The programme will have an overall customer and stakeholder benefit. Our plans include the phased demolition of all of these gasholders over a 16 year period which started in April 2013.

Our output target for RIIO is to decommission a minimum of 23 gasholders. We have successfully completed the first gasholder decommissioning in 2013/14.

	RIIO target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	Total
Number of gasholders decommissioned	23	1	2	2	3	3	3	4	5	23

Figure 2.24: Gasholder decommissioning forecast

2.4 Customer service outputs

The aim of the customer service output measures are to improve levels of customer satisfaction from the activities carried out by NGN. The outputs also seek to encourage us to undertake effective engagement with our stakeholders and reflect their views in the day to day operation of our business.

There are no RIIO targets set by Ofgem, only a penalty or reward.

	RIIO-GD1 year 1 target	13/14	RAG
Customer satisfaction survey			
Unplanned interruption (Overall satisfaction score from 0-10)	9.0	9.25	G
Planned interruption (Overall satisfaction score from 0-10)	8.5	8.38	A
Connections (Overall satisfaction score from 0-10)	8.4	8.61	G
Complaints			
Complaints metric	11.57	4.78	G
Stakeholder engagement			
Maximise rewards under the stakeholder incentive target (score from assessment panel)	<5.0	6.75	G

Figure 2.25: Customer service outputs 2013/14 performance

We have achieved an excellent outcome on our customer service outputs, achieving the number one ranking on customer satisfaction, significantly improving our complaint handling and performing well in the stakeholder engagement assessment.

We expect to maintain and build on year one performance and be the best on customer service. More detail on each individual measure can be found in the following sections together with our forecasts for the whole of the RIIO period.

2.4.1 Customer Satisfaction Surveys (CSS)

Customer satisfaction surveys involve interviews with customers based on the interaction that they had with NGN in relation to:

- A new or altered connection;
- An unplanned interruption to a gas supply, as a result of a gas leak; or
- A planned interruption, as a result of work targeted by NGN.

No specific targets have been set for the customer satisfaction outputs. However, there are baseline targets for the associated financial incentive scheme. We are aiming to achieve the maximum reward under the scheme, and so the scores necessary to achieve this are our minimum targets. We are forecasting to outperform this over the RIIO period, as detailed in the table below.

	NGN RIIO target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Unplanned interruption (Overall satisfaction score from 0-10)	9.0	9.3	9.4	9.4	9.5	9.5	9.5	9.5	9.5
Planned interruption (Overall satisfaction score from 0-10)	8.5	8.4	8.5	8.6	8.6	8.6	8.6	8.6	8.6
Connections (Overall satisfaction score from 0-10)	8.4	8.6	8.7	8.8	8.8	8.8	8.8	8.8	8.8

Figure 2.26: Customer service satisfaction survey forecasts

We have achieved our target in 2013/14 for both unplanned interruption and connections, but just missed the maximum reward for planned interruption. However this is still an important achievement and represents significant year on year progress towards our aims.

A lot of this can be attributed to a real focus on the customer experience across the business, demonstrated by the weekly customer meetings, attended by the NGN CEO and representatives from across the network. The format of this meeting has evolved from transactional to transformational. Ideas and innovations are discussed more than routine statistics, as these now form part of our daily discussions.

Over the last few years we have focussed heavily on embedding the importance of the customer within our culture and people, but recognise we now need to ensure our processes are fully future proof by having the systems in place to deliver for our customers.

To support this, we are currently looking to invest in both new telephony in 2014 and a customer experience management system in 2015, in order to consolidate our current strong position and drive further improvement.

2.4.2 CSS results for unplanned interruptions

In 2013/14 we have delivered a score of 9.25, an increase from 8.83 in 2012/13.

We have achieved this by keeping a consistent focus throughout the year on the customer, with more ownership being shown within our nine patch operating model for improving customer experience. Daily review calls discuss all open interruptions and plans to resolve them.

We also rebranded all our livery and PPE to give a more professional image and have worked with the business to reword the emergency and repair customer leaflet to make sure that we are communicating in a friendly and informative manner. We have also worked really hard to remove jargon and acronyms from our literature.

2.4.3 CSS results for planned interruptions

In 2013/14 we have delivered a score of 8.38, an improvement on our score of 7.83 in 2012/13.

We have achieved this through the introduction of a number of initiatives this year that have helped to drive the focus on both customer and stakeholder.

Each replacement project is now categorised either gold (G), silver (S) or bronze (B) according to the level of customer / stakeholder involvement, as well as the level of disruption. A mitigation plan is then developed to look at all the risks and ensure that we minimise these risks throughout the delivery of the project.

We have nine customer care officers and two stakeholder officers across the network. It is their primary responsibility to complete the initial mitigation plans and provide as much supporting customer and stakeholder information to the operational teams as possible. They are also heavily involved in coaching the operational teams to empathise with our customers and stakeholders at every stage of the process.

We still encounter a ramp up of work towards the regulatory year end, during months where customers rely on their gas the most. We are working hard to make sure that we maximise working during the summer, and therefore are able to reduce any disruptive activities during the winter months.

We have also focused on communicating effectively before / during and after a project. We have rewritten all our customer literature this year to make it more friendly and informative to customers, ensuring that we removed any jargon. We are now regularly holding customer feedback workshops to understand what customers think about the service we deliver.

2.4.4 Connections

In 2013/14 we have delivered a score of 8.61 – this is a huge improvement from the score of 7.85 we recorded for 2012/13.

We have achieved this by rebuilding the whole connections process from a customer perspective, using a group of colleagues from within the business to drive the change through to the final stages of implementation. This team have managed everything from introducing a new app to manage customer applications to redesigning all the literature.

2.4.5 Complaints metric

Under RIIO-GD1, complaints performance is incentivised through penalties for poor performance. NGNs aim is to avoid any penalties for all eight years of RIIO-GD1.

Performance is measured via the complaints metric, which is a composite score calculated as the sum of each GDNs performance against four elements. The table below summarises the four elements and our performance in 2013/14.

	Complaint Scores
Percentage of complaints unresolved after one working day	38.08%
Percentage of complaints unresolved after 31 working day	1.44%
Percentage of repeat complaints	1.06%
The number of Energy Ombudsman (EO) decisions that go against NGN as a percentage of total complaints received	0.1%

Figure 2.27: Complaint metric breakdown

	NGN RIIO maximum reward target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Complaints metric	11.57	4.78	4.2	3.6	3.05	3.0	3.0	3.0	3.0

Figure 2.28: Complaint metric forecast

The above scores for 2013/14 generate a weighted complaint score of 4.78, which does not generate any penalties. Penalties would only be imposed if our score was 11.57 or more. Therefore, a score of 4.78 over 2013/14 is a very good performance, but one we are looking to improve on in future years.

We have achieved this by a targeted focus on resolving customer issues first time, by introducing our 90 in 60 process. This is a commitment to agree resolution to customer complaints 90% of the time in 60 minutes. We are therefore driven to make early contact with our customers, or even better, resolve the issue during the customer's initial contact. This then gives us a greater chance to meet D+1, and delight our customers with a speedy response.

Achieving 90 in 60 demands resource effort as soon as a complaint is received into the business. However, there is nothing more important than dealing with problems that our customers are telling us about, and the business is geared up to deal with these immediately. If a failure occurs, either 90 in 60 or D+1, we work really hard to understand the root cause, and share the learning on how we could have done things better for the customer.

2.4.6 Stakeholder engagement

We have always recognised that our work significantly impacts our stakeholders and customers, and so we've always liaised closely with both. The importance of this is now further recognised through this output, which aims to reward companies for high quality outcomes resulting from their stakeholder engagement process. This is assessed annually through an independent panel. Our target is to provide consistent and quality stakeholder engagement, deliver on our promises and through this, maximise the rewards available through the incentive.

The initial feedback on our performance in 2013/14 has been extremely positive and we are currently awaiting confirmation of the final award.

Over the past three years we've gone further than ever before to make stakeholder engagement an integral part of the way we operate. We have introduced a stakeholder engagement strategy to ensure we maximise our performance in line with our stakeholders guidance, now and in the future. Clear processes and guidelines are now in place, so that all colleagues, from our CEO to our engineers in the field, recognise the importance of engagement and the NGN way of delivering it.

Our stakeholder engagement strategy is a practical, working document which describes our approach to engagement. It acts as both a road map for our own colleagues and a statement of intent to our stakeholders and wider customer base. It contains:

- Background on why stakeholder engagement matters, and how it aligns to our wider ambitions for the company;
- Our stakeholder engagement framework – five core processes through which we are taking a thorough and inclusive approach;
- An issues table, listing key stakeholders and their priorities;
- Our governance structure outlining responsibilities for stakeholder engagement at every level; and
- How we report and evaluate the outcomes of stakeholder.

2.5 Environmental outputs

The aim of the environmental output measures is to reduce the environmental impacts of gas distribution. This is delivered through the measures detailed below.

The outputs in this area are split into a broad measure and a narrow measure.

The outputs under the broad environmental measure are aimed at ensuring that NGN plays a role in delivering a low carbon energy sector. The most prominent role involves facilitating the connection of new renewable gas plant. As NGN doesn't have control over the delivery of such connections, the output measures are more around assisting and promoting such development rather than specific targets for the amount connected. The outputs and our achievements are set out below.

The outputs under the narrow measure are aimed at minimising the environmental impact of NGN's own activities.

2.5.1 Broad measure

	RIIO-GD1 year 1 target	13/14	RAG
Total capacity of biomethane connected (MW)	No target	0	G
Total capacity of biomethane enquiries/applications in progress (MW)	No target	130	G
Information provision and arrangements for customers wanting to inject gas on the distribution network	No target	Met	G
Voluntary standards of service: 15 day response to initial enquiry under 7 bar	100%	100%	G
Voluntary standards of service: 30 day response to capacity study under 7 bar	100%	100%	G

Figure 2.29: Environmental broad measure 2013/14 performance

In the first year of RIIO we have played a very active role in the introduction of biomethane connections, including taking part in a regional study to look at the size of the potential market in our regions and setting up a dedicated team to assist our stakeholders through the biomethane connection process. We have had 45 enquiries so far, and carried out four <7 bar design studies, all within the voluntary standards of service for distributed gas connections we have set. One project is in progress, targeted for completion in October 2014.

In addition, we have introduced a common set of documents with the other GDNs, which includes;

- Details of the statutory and regulatory framework that applies to distributed gas connections;
- The likely cost elements, charges and timescales involved in the application process for such connections;
- Details of the arrangements and opportunities available for competitive activity in the provision or procurement of such connections; and
- Engineering and other technical matters relevant to such connections.

These are all available on our website, together with details of relevant contacts within the Network.

	RIIO annual target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Total capacity of biomethane connected (MW)	No target	0	13	45	81	130	180	220	250
Total capacity of biomethane enquiries/applications in progress (MW)	No target	130	215	300	260	100	50	0	0
Information provision and connection charging for distributed gas	No target	Met	-	-	-	-	-	-	-
Voluntary standards of service: 15 day response to initial enquiry under 7bar	100%	100%	100%	100%	100%	100%	100%	100%	100%
Voluntary standards of service: 30 day response to capacity study under 7bar	100%	100%	100%	100%	100%	100%	100%	100%	100%

Figure 2.30: Environmental broad measure forecast

We expect to be able to construct eight connections during RIIO-GD1, by actively stimulating the market. We have now employed a dedicated resource to coordinate all of our activities in this area.

Our voluntary standards of service currently cover pre quotation data. These will be expanded to include quotation timescales, work scheduling and work completion when we have more experience of the market place. We have achieved a 100% success rate against these standard so far and expect to maintain this during RIIO-GD1.

2.5.2 Narrow Measure

The outputs under the narrow environmental measure cover these areas:

	RIIO-GD1 year 1 target	13/14	RAG
Shrinkage gas			
Shrinkage baselines (GWh)	459 GWh	421	G
Leakage baselines (Gwh)	434 GWh	399	G
Business Carbon Footprint (BCF)			
BCF excluding shrinkage	None	21,535 Tn	A
Other emissions and natural resource use			
Number of sites where statutory remediation has been carried out	None	0	G
Use of virgin aggregate	None	37,862 Tn 28.58%	R
Amount of spoil to landfill sites	None	61,555 Tn 35.99%	R
ISO14001 major non conformities	None	0	G

Figure 2.31: Environmental narrow measure 2013/14 performance

Our year one performance on the narrow measure was satisfactory overall. An excellent performance on shrinkage gas reduction (which is 95% of our business carbon footprint) was coupled with a mixed performance on the other emissions and natural resource use outputs.

- **Shrinkage gas**

NGN is responsible for purchasing gas to replace the gas lost through shrinkage. Shrinkage is comprised of leakage from pipelines (c.95%), theft from the gas network (c.3%), and own use gas (c.2%). NGN has been set output targets to reduce the amount of shrinkage and leakage from our network over RIIO-GD1. The table below sets out the target shrinkage and leakage volumes set out in our licence, against our actual and forecast performance

(GWh)	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Shrinkage baselines	459	449	438	428	418	407	397	386
Shrinkage actual	421	399	388	378	368	357	347	336
Leakage baselines	434	424	413	403	392	382	371	361
Leakage actual	399	377	366	356	345	335	324	314

Figure 2.32: Shrinkage and leakage forecasts

NGN have outperformed both shrinkage and leakage targets in 2013/14 and plan to further outperform the annual targets throughout RIIO-GD1. We will achieve this through a combination of:

- Targeting our iron mains replacement programme at the leakiest pipes with the highest risk;
- Reducing system pressures, through strong governance and close working practices between our pressure management, network validation and network maintenance teams; and
- Effectively managing our levels and use of MEG (Monoethylene Glycol), a 'wet' gas used to saturate and swell metallic joints which otherwise may leak gas.

- **Business Carbon Footprint (BCF) (excluding Shrinkage)**

All GDNs are expected to reduce their BCF over time. No specific targets have been set for RIO-GD1. However our performance will be compared with other GDNs and published on an annual basis.

At NGN we have strengthened the BCF collation process during 2013/14. We have worked with our energy management consultants to ensure the data provided is validated and accurate. This is the primary driver for the increase in our reported business carbon footprint. All new contract awards will include specific environmental KPIs, supported by regular challenge, review and contract management meetings.

Other key areas we are working on to improve performance include;

- Working with contractors to improve fuel and energy data provision and to set appropriate KPIs;
- Using our fleet vehicle replacement programme to improve vehicle efficiency as the installation of Green Road technology will become the norm;
- Installing new equipment across the Network to enhance the use of technology for video conferencing and remote networking, which will reduce the reliance on travel; and
- Liaising with the PE suppliers to drive the provision of emissions data, which is applicable to all GDNs.

BCF is calculated across three categories, described as Scopes 1, 2, 3. Scope 3 is still being developed, but currently includes rail / air / ferry travel; car hire; contractor fuel use and PE pipe (end to end process). NGN are members of the ENA Environmental Working Group who are currently developing and agreeing further inclusions and methods of calculation for Scope 3 during 2014.

The table below provides forecast figures, based on a 0.5% year on year reduction, based solely on Scope 1 (excluding shrinkage) and Scope 2 emissions as these are currently defined and understood.

	12/13 Actual	13/14 Actual	14/15	15/16	16/17	17/18	18/19	19/20	20/21
NGN non-shrinkage BCF (Scope 1 and 2) - tCO2e	8,593	8,722	8,678	8,635	8,592	8,549	8,506	8,464	8,421

Figure 2.33: Business Carbon Footprint forecast

- **Other emissions and natural resource use**

Statutory remediation of contaminated land

No specific targets have been set for statutory land remediation. During 2013/14 we have updated our land remediation strategy with the help of external experts. We have prioritised sites for investigation and will develop appropriate mitigation measures during 2014/15 in relation to any outcome from these investigations.

We are currently forecasting to not remediate any sites until this investigation work has been completed.

	RIIO target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Number of sites where statutory remediation has been carried out	None	0	0	0	0	0	0	0	0

Figure 2.34: Statutory remediation of contaminated land RIIO forecasts

- **Use of virgin aggregate and amount of spoil to landfill**

We have no specific targets in this area but disappointingly NGN has seen an increase in the use of virgin aggregate used and spoil disposed to landfill. This is partially due to the change in the outsourced contractor structure we use to facilitate our replacement programme, but is mainly attributed to the lack of Highways Authority and Utilities Committee (HAUC) approved recycling centres within the Network area. This issue is to be discussed at HAUC.

We have liaised with the Environment Agency and secured agreement to optimise the use of spoil through integration with the gasholder demolition programme in 2014. We are also working very closely with our replacement contractors to improve performance in this area. KPIs are included within contract arrangements and enhanced contract management processes will be implemented for 2014/15.

	RIIO target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Use of virgin aggregate	None	37,862 Tn 28.58%	31,000	25,000	20,000	17,000	17,000	17,000	17,000
Amount of spoil to landfill sites	None	61,555 Tn 35.99%	50,000	40,000	32,000	26,000	20,000	16,000	13,000

Figure 2.35: Use of virgin aggregate and amount of spoil to landfill sites RIIO forecasts

- **ISO 14001 major non-conformities**

NGN received an excellent assessment in 2013 and anticipate continued success at the full re-certification visit in September 2014. We anticipate no major non-conformities in RIIO-GD1.

	RIIO target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
ISO14001 major non-conformities	None	0	0	0	0	0	0	0	0

Figure 2.36: ISO 14001 major non-conformities output forecasts

2.6 Social obligations outputs

The two specific aims of the social obligation output measures are to help alleviate fuel poverty through extending the gas network and to improve awareness of the risks from carbon monoxide. There is also a general output to play an active role in addressing wider social issues.

	RIIO-GD1 Year 1 target	13/14	RAG
Number of fuel poor network connections	1,500	1,164	A
Providing all emergency staff with upgraded detection equipment which will enable them to test for the presence of carbon monoxide and provide appropriate advice	1,000	1,000	G
Ongoing programme of activities to improve general customer awareness of the danger from carbon monoxide	See Below		-
Other social issues	See Below		-

Figure 2.37: Social obligations outputs

We have made a satisfactory start to the delivery of outputs in this category. We are slightly behind on delivery of fuel poor connections, but have done some excellent work on carbon monoxide and other social issues.

We expect to increase the number of fuel poor connections in the coming years and build on our carbon monoxide and other social programmes. More detail on each individual measure can be found in the following sections together with our forecasts for the whole RIIO period.

2.6.1 Number of fuel poor network connections

Our RIIO output target is to supply 12,000 gas connections to customers in fuel poverty over RIIO-GD1. We have partnered with Community Energy Solutions (CES) to deliver on this output and intend to fully meet our targets despite challenges arising from changes in government funding for fuel poverty support beyond the gas connection.

	RIIO target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	Total
Number of fuel poor network connections	12,000	1,164	1,400	1,700	1,800	1,800	1,500	1,400	1,250	12,014

Figure 2.38: Fuel poor workload forecast

During 2013/14 NGN has delivered 1,164 fuel poor connections, which is slightly behind our original forecasts and reflects the difficulties in securing in house funding for new central heating systems following the abolition of the previous government schemes (CESP and CERT).

The following is a summary of the key activities we are currently undertaking to ensure that we are able to match our promises in this area;

Extension of fuel poor 'partners'

We are growing a more diverse range of 'partners' to increase access to a wider range of potential customers in need of support, and potentially unlock access to greater funding for activities beyond the meter. Specifically we are currently working with Ofgem to add two additional partner organisations.

Off-gas communities – extensions and infills.

We are;

- Working with partner organisations to identify extension and infill opportunities;
- Developing relationships with community groups to identify opportunities; and
- Discussing with Independent Gas Transporters (IGTs) how we may be able to work together to supply gas solutions to those in fuel poverty.

Off-gas communities – rural.

We are;

- Working on a trial to support OIL CAN (Community Action Northumbria), supporting initiatives to reduce fuel costs by group purchasing oil to benefit from discounts; and
- Reviewing and seeking options for research / development / trial of areas suitable for bio methane projects.

Energy Challenges

Multi Storey Buildings (MSB). We are working with Newcastle University, Newcastle Council and Northern Power Grid to consider energy solutions for MSBs. This includes considering direct solutions and behavioural changes associated with buildings greater than six floors.

Behavioural / human factors. We are working with an external supplier to engage with various tenants to survey their behaviour, use and expectations around energy supply and usage.

Fuel poverty awareness

National Energy Action (NEA) have been engaged to deliver fuel poverty awareness training to 130 of our customer contact staff. We believe this knowledge at point of contact will help support and bring additional assistance to our most vulnerable customers.

We are targeting areas with multiple depravation factors by actively promoting the benefits of gas to support and assist a move from fuel poverty.

To help us identify these areas, we have been developing relationships with social landlords and local authorities.

Children's Society

We are funding three advisors working for the children's society in Bradford, initially for 12 months. They will act as our eyes and ears, looking to bring opportunities for NGN to support vulnerable customers in Fuel Poverty.

2.6.2 Carbon monoxide detection and awareness

Under this output measure we are committed to improving awareness of the dangers from carbon monoxide. We are using two workstreams to achieve this.

Firstly, we are providing all emergency staff with a pioneering handheld device called a Gascoseeker, which not only detects the level of gas (methane) in the air, but also CO. This enables our emergency engineers to determine whether CO is present in a customers home and the source with a much greater level of accuracy. We have committed £2m to equip all our emergency engineers with Gascoseekers by September 2014. We are on track to deliver this, with more than 1,000 already in use.

The data gathered from the new gascoseekers can also be used to target and link to our awareness programmes.

We provide training so our engineers can safely inform and advise our customers regarding the detection of CO. In parallel to this we have also developed leaflets to leave with our customers explaining the dangers of CO.

	RIIO target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Providing all emergency staff with upgraded detection equipment which will enable them to test for the presence of carbon monoxide and provide appropriate advice	1,200	1,000	200	Achieved					
Ongoing programme of activities to improve general customer awareness (number of surveys conducted)	See below								

Figure 2.39: Carbon monoxide outputs

Secondly, we have an ongoing programme of activities to improve general customer awareness of CO and its dangers. This includes;

- CO education in the classroom – an education programme aimed at Key Stage 3 (11-14) pupils to promote CO, its risks and symptoms, as well as an appreciation of the importance of carbon reduction, recycling and sustainable living;
- Customer CO briefings – we are the first GDN to deliver CO awareness briefings to customers in their homes following emergency call outs. These are aimed at the elderly and other vulnerable customers. During the briefing our engineers explain key facts about CO using specially developed materials; and
- iCOP and iCOP2 – in 2012 we launched an innovative smartphone app, aimed at 18-24 year olds living in rented accommodation – a key 'at risk' group. The app highlights the dangers of CO using an engaging film noir style detective game. iCOP2 is currently under development.

2.6.3 Other Social issues

As a major employer and service provider in the North of England, we have both an obligation and wide ranging opportunities to support the communities we operate in, across a broad range of issues. NGN are engaged in several activities to support this obligation, which we fully intend to expand over RIIO-GD1.

The current activities include;

Nutrition – we have initially supported this through donations to local food banks, which has opened up an additional opportunity in Leeds supporting a local trust, managed entirely by volunteers. They have requested additional professional services support around marketing and accountancy. We will be supplying support services in these areas.

Debt Management – we have directly supported NEA in their role advising on benefits which has released around half a million pounds of previously unclaimed funds. We plan to supplement and extend these services;

- Warmzones offer benefits advice, and their services will be extended to all vulnerable customers we encounter to ensure they are aware of entitlements; and
- Step Change offer a range of debt management programmes. We are targeting to further develop this relationship to refer or signpost customers to these services.

Stakeholder engagement – we have held two events to capture stakeholder expectations, and have used the events to focus in on the following areas;

- Strategic approach – we are developing a wider social strategy beyond fuel poverty;
- Communication – we have followed up with one to one meetings as requested and continue to review how we can support charities more effectively; and
- Delivery on promises – as we mature, we are now looking to better support and coordinate activities around key themes.

Employee led charitable support

- We continue to support employees engaged in charitable services, through the release of time and matched funding for fundraising events.

2.7 Connections outputs

The aim of the seven primary connections output measures is to ensure that NGN provides an efficient and effective service to customers wanting to connect to the gas network.

Our RIIO-GD1 output targets for connections are significantly higher than the obligations required by our licence, reflecting our aim to provide a best in class service.

	RIIO annual target	13/14	RAG
% of standard connection quotes issued in 6 working days	99.6%	99.52%	A
% of non-standard connection quotes below 275kwh issued in 11 working days	99.6%	99.45%	A
% of non-standard connection quotes above 275kwh issued in 21 working days	99.6%	97.5%	A
% of land enquiries where response sent within 5 working days	99.6%	99.5%	A
% of commencement and completion dates for connections below 275 kwh provided within 20 working days	99.6%	99.31%	A
% of commencement and completion dates for connections above 275 kwh provided within 20 working days	100%	100%	G
% of connection jobs substantially completed on date agreed with customer	95%	97.21%	G

Figure 2.40: Connections 2013/14 outputs

We have made significant progress towards achieving these extremely challenging targets in 2013/14 and expect to maintain or improve our performance for all the outputs over the next seven years.

This represents a very good start, the results of which can be seen in the improvement in customer satisfaction scores for our connections business.

The table below compares our RIIO-GD1 output target with our actual performance in 2013/14 and forecast performance for the remainder of the RIIO-GD1 price control period.

	RIIO annual target	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
% of standard connection quotes issued in 6 working days	99.6%	99.52%	99.6%	99.6%	99.6%	99.6%	99.6%	99.6%	99.6%
% of non-standard connection quotes below 275kwh issued in 11 working days	99.6%	99.45%	99.6%	99.6%	99.6%	99.6%	99.6%	99.6%	99.6%
% of non-standard connection quotes above 275kwh issued in 21 working days	99.6%	97.5%	97.8%	98.2%	98.5%	98.8%	99.1%	99.4%	99.6%
% of land enquiries where response sent within 5 working days	99.6%	99.5%	100%	100%	100%	100%	100%	100%	100%
% of commencement and completion dates for connections below 275 kwh provided within 20 working days	99.6%	99.31%	99.6%	99.6%	99.6%	99.6%	99.6%	99.6%	99.6%
% of commencement and completion dates for connections above 275 kwh provided within 20 working days	100%	100%	100%	100%	100%	100%	100%	100%	100%
% of connection jobs substantially completed on date agreed with customer	95%	97.21%	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%

Figure 2.41: Connections forecast outputs

Our connections delivery model has undergone material changes in order to achieve this performance level. Notably in 2013 we;

- Relocated the connections design and quotation operation from Edinburgh to our existing offices in Sunderland;
- Brought the service delivery operations in house from the previous contractor model;
- Introduced a new project manager-led operational model whereby different functions (design, quotations, surveying and administration) work together in teams rather than functional silos;
- Compressed the previously 12-step Connections processes into 2-steps on the back of upskilling team members to perform more functions – saving time, hassle and money;
- Forming a new Connections Consultancy Group comprising a cross-section of team members looking at ever more effective models of working; and
- Introduced bespoke training and development programmes – 25% of the connections team is currently undertaking vocational training.

All of these changes have helped us drive improved performance through a more energetic, skilful and customer centric team, with high levels of personal accountability. We have had zero employee churn since these changes and customer complaints have fallen by 75%.

Examples of the specific changes we have made in Connections include:

- Launching the industry's first ever connections app, developed because 25-44 year olds said they wanted to apply in their own time and receive updates on their mobiles. Historically our least satisfied customer segment, this group is now one of our most satisfied (93%);
- Producing bright, engaging and customer-friendly literature, with four different versions providing simple, easy to understand information for different customer segments. This has produced a major lift in the customer score for our application process from 7.81 in May 2013 to 8.91 in February 2014;
- Introducing 'save the date' cards flagging when we will be coming to do the work (customers frequently forgot). Work completed when scheduled is now 97%;
- Pledging to phone every customer before and after their appointment;
- Revamping our website to incorporate an online application facility (used by 1,679 or 15% of customers in five months) and an information video (viewed 855 times since January 2014); and
- Reducing the number of stages in the connections process - training one person to perform more tasks means we can now meet the needs of customers in in a shorter timeframe.


NORTHERN GAS
NETWORKS
APOLOGISE FOR ANY
INCONVENIENCE DURING
THESE ESSENTIAL WORKS
EMERGENCY TEL No
0800 111 999

Innovation

3

3.1 Introduction

Many elements of the RIIO framework are intended to encourage innovation. These include strong emphasis on delivering outputs and lengthening the price control period to provide companies with more certainty of the rewards for successful innovation.

RIIO-GD1 includes a stimulus package to fund innovation where the commercial benefits may be uncertain and therefore stakeholders are unwilling to fund research and development projects speculatively. This stimulus package has three mechanisms where NGN can obtain additional funding for innovative projects.

Network Innovation Allowance (NIA) – to fund smaller innovation projects that will deliver benefits to customers;

Network Innovation Competition (NIC) – an annual competition to fund selected flagship innovation projects that would deliver low carbon and environmental benefits to customers; and

Innovation Roll-out Mechanism (IRM) – to fund the roll-out of proven innovations which will contribute to the development in GB of a low carbon energy sector or broader environmental benefits.

3.2 Network Innovation Allowance

3.2.1 Significant New Learning

The first year of the Network Innovation Allowance (NIA) has supported a massive positive shift in NGN's culture and employee engagement. Building on the work done within our Inspire Academy to encourage individual responsibility and ownership, many more employees are now actively looking for ways to improve the customer experience through the use of innovation.

For example, our Young Persons' Network promoted the use of smart technology to make it easier for people to share their own innovative ideas! So, working in collaboration with the Energy Innovation Centre, we have successfully developed and rolled out a 'Suggestion Scheme' app. Now people's ideas come straight to the innovation team's inbox for their immediate attention. After making a few modifications, it's intended the app will be offered to other GDNs later this year for them to roll out in their areas.

Quote from Denise Massey, Managing Director, Energy Innovation Centre:

"NGN has completely embraced the true ethos of innovation. They understand that to drive innovation, you need to sometimes take a calculated risk and try something completely different, because if you strip out all the risk you also remove the potential for substantial positive change.

What's also refreshing is that, at all levels of the business, people are empowered and encouraged to challenge established ways of doing things. As a result, NGN people are passionate, full of energy and enthusiasm and a joy to work with.

NGN is our go-to GDN when it comes to exploring initiatives that really challenge established mind-sets', because if anyone will embrace a big idea, it's them."

When our innovation team receive ideas they are assessed against six innovation focus areas. These were introduced across the business to support our adoption of the NIA. They help us determine the problems and business areas our ideas impacted, and allow us to determine a business sponsor and subject matter expert. These two leads are responsible for assessing the proposed solution and ensuring it delivers value for money. All projects are then approved and monitored through our normal investment expenditure governance.

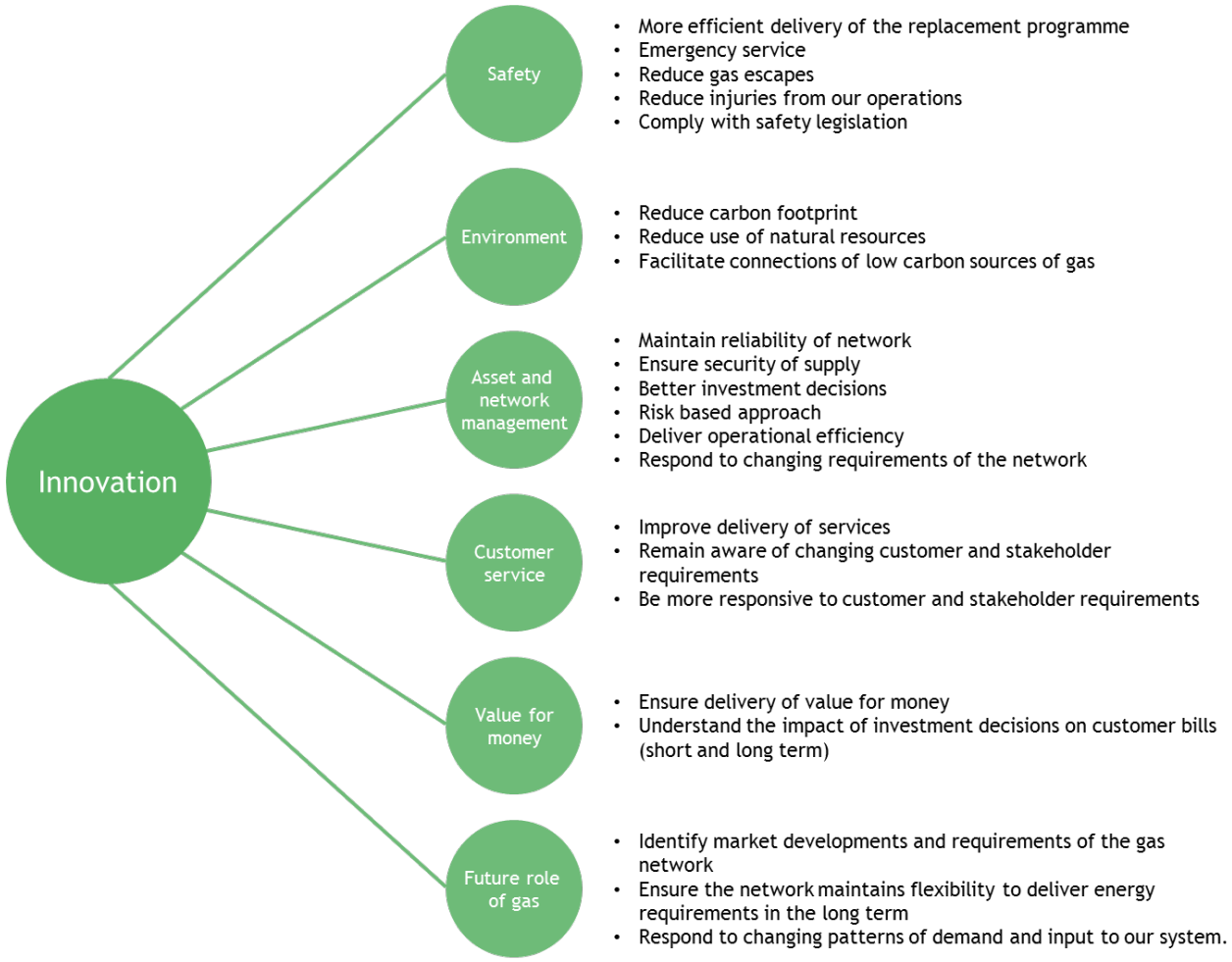


Figure 3.1: NGN's innovation focus areas

3.2.2 Projects and expenditure in 2013/14

In total we invested £1.37m in 2013/14 across 27 different projects. In terms of our focus areas we invested;

- £0.27m in 'Asset and Network Management' projects;
- £0.02m in 'Customer Service' projects;
- £0.12m in 'Future role of gas' projects;
- £0.42m on 'Efficiency' projects;
- £0.55m on 'Safety' projects.

Details of all of our projects can be found on our Innovation website.

http://corporate.northerngasnetworks.co.uk/innovation/

We highlight six key projects from 2013/14 as examples of the work we have carried out.

- **Safety - Remote water removal system**

Water ingress into gas mains is one of the biggest problems faced by GDNs, resulting in hundreds of supply interruptions every year, compromising the safety of both customers and operatives and tying up significant resource.

This two-stage project seeks to find a solution to this long-standing issue by:

- Identifying the causes of ingress by accessing local weather and flood data, mains replacement data and geographic locations to determine how water is entering the network; and
- Developing bespoke technology that not only visually locates the source of the leak, but then also extracts the water in one operation, with no need to turn off the gas supply.

NGN has contracted Synthotech Ltd, an SME that developed a revolutionary solution for a gas distribution client in Brazil which combines a CCTV camera with an in built water extraction device. The camera/extraction technology not only separates gas from water, but can also inject the gas back into the main, reducing environmental impact and ensuring that customers are not given cause to worry because they can smell gas.

However, the solution developed for the Brazilian gas network uses a different access system, is designed for different pipes and operates at far higher pressures (5 Bar) than the UK network, so significant modifications are required, such as altering the gas injection system to operate at a lower pressure differential. We plan field trials of two prototypes, one for mains and one for services in autumn / winter 2014.

"NGN has acknowledged that in the 21st Century there needs to be improvements in water management. Water ingress causes major disruption and NGN is taking a very proactive approach to not just removing the water but identifying how and why it is entering the network. In partnership with Synthotech, they are supporting the development of a total network solution for water management."

Wez Little, Innovations Director, Synthotech.

• Orifice plate deformation

Orifice plate meters, used widely across the gas transmission system, are based on a technology that is hundreds of years old. Within our network there are individual units still in use that are in the region of fifty to sixty years old. It has become apparent that this type of meter does not always provide the accuracy and consistency of data required. Using the metering at higher pressures may cause permanent deformation, which might affect the accuracy of the reading to the point it no longer conforms to the standard required.

In March 2013 NGN joined National Grid Gas Distribution (NGGD), National Grid Gas Transmission (NGUKT) and Scotia Gas Networks to collaboratively progress a project to consider this issue. The project aim is to both understand the potential scope and impact of deformation, and agree a new standard for meters to address any concerns. The project partners are committed and confident that we can develop a more effective standard. We are working towards sharing this with the wider industry at the 2015 North Sea Flow Management Workshop.

• Asset and network management biomethane connections guidelines

This initiative is designed to deliver against our asset and network management objectives of ensuring the security of supply and responding to the changing requirements of the network.

In 2013, we consulted with farmers, local authorities, commercial and industry waste organisations and water companies to generate the first ever regional study into the size of the biomethane connection market.

The primary conclusion of the study was that there are hundreds of opportunities for commercially viable biomethane plants in the North of England. Currently the major barriers are that there are no guidelines for GDNs or potential producers outlining how to get a connection or how this should be managed once it is in place.

We collaborated with Northumbrian Water (NWL) to develop connections guidelines based around best-practice methodologies whilst working towards connecting the NWL Howden waste water treatment plant to the network.

A draft user guide has been produced, and both the Howden Biomethane project and the guide are scheduled to go live in November 2014.

This project is being run concurrently with a similar initiative being undertaken by Wales and West Utilities with Bristol Water. The sharing of expertise between all parties has provided invaluable insight.

Together we have identified two potential connection routes:

- Minimum connection – this option allows producers to source their own equipment, oversee construction and commission their connection before handing over the management of the connection to NGN; or
- Maximum connection – this option involves NGN managing the whole process.

We will use our findings to open up the market by providing a step by step process for new entrants alongside associated costs for both connection routes.

• Beyond the visual line of sight

NGN currently use fortnightly helicopter surveys of our high pressure network (an area of 25,000km^2 containing 1,200km of pipelines). These are time consuming, costly and have a negative environmental impact.

With these factors in mind, we have looked into how other industries make use of unmanned surveillance technologies as a more efficient alternative to survey our network.

We were approached by VTOL (Virtual Take Off and Landing) Ltd who had experience in this area, but had not worked within the utilities sector before. We have commissioned them to develop a business case for NGN adopting a form of Beyond the Visual Line of Sight (BVLOS) unmanned inspection technology.

We finished the initial stage of data gathering in July 2014. This will inform the development of a business case for NGN to adopt the technology, including the building of a computer generated simulation and undertaking a cost / benefit analysis.

If the analysis deems the project viable, VTOL will develop a bespoke specification for NGN that we can handover to the Civil Aviation Authority (CAA) for sign off in principle. If signed off, we would develop a prototype aimed at securing firm CAA approval and introduce the working technology into service. We are currently working towards a potential go-live date of summer 2017.

Further information can be found at: http://www.smarternetworks.org/Project.aspx?ProjectID=1470

NGN is working alongside Scotia Gas Networks and electricity distribution networks, where VTOL is conducting a parallel project. Comparing and contrasting both projects has provided some invaluable insights.

• Customer service predictive analytics

Predictive analytics is an advanced forecasting process that, over the past 15 years, has become widely and successfully used within finance, retail and emergency service organisations to optimise output performance, customer experience and resource management. It works by using detailed analysis of large amounts of data to predict likely future scenarios to enable planning, prevention and influencing to mitigate any potential issues.

NGN wanted to test this type of analytics to find out if it could be of benefit to the gas distribution industry.

We started a proof of concept trial in 2012/13, which saw us building a trial model that was compared against real data. The trial was a huge success, with an accuracy level of 83% in predicting the probability of a reported gas escape and 96% accuracy in predicting the probability that we would be at risk of failing to attend an escape within the required timescales.

In June 2013, predictive analytics was assigned to complete further analysis in six key business areas including asset management, operational delivery, investment efficiency and customer impact.

In February 2014 we appointed two organisations to intensively investigate each of the six areas to determine data availability and suitability for a range of analytical situations. One is an academic-based team who use frontier machine-learning techniques and numerical analysis. The other uses sophisticated commercially available software platforms. Both seek to test, identity and understand relationships between datasets and use these to develop models that can then be used to allow more informed and accurate decision-making.

The next phase of the project (2014-2016) will include maximising the learning from developing analytical models and solutions, delivering these into the business and sharing the learning. In parallel, a business case is being developed to permanently adopt analytics as a ‘business as usual’ approach across the organisation.

Value for money acoustic camera and core n vac

Over 40% of the total cost and by far the most disruptive element of our repair activities is reinstatement. This makes reinstatement a prime focus for innovations to increase efficiencies and reduce costs.

Core n Vac technology is not new to the gas industry, but it had not been fully proven across all repair techniques. Meanwhile, quickly and accurately locating the leak in the first place remained an issue.

We had established that core reinstatement costs are c.£40, while a traditional reinstatement costs are several hundred pounds. We also wanted to prepare a business case detailing the further value that could be derived by enhancing Core n Vac with smart leak detection technology.

Specifically, we were looking to prove that:

- Combining accurate leakage location with coring could further reduce the time spent pinpointing leaks (by up to 33%);
- This combined approach could reduce the number of long duration jobs on the escape log by more than 50%;
- Deploying specialist location skills on difficult to locate leaks would allow repair teams to focus on emergency customers' critical repairs;
- There was a noticeable reduction of negative impact on highways; and
- Levels of customer satisfaction would increase.

Our trial consisted of 100 jobs using visual and acoustic leakage detection technology alongside Core n Vac for a twelve-week period during early 2014.

The trial has been a resounding success on a number of levels (time spent pinpointing leaks reduced by 50%, number of long duration jobs reduced by 12% and jobs completed first time rose to 30%). We are currently preparing a detailed business case for presentation to the business, other utility businesses and local authority stakeholders.

Future role of gas development of standards for biogas, biomethane and shale gas

With NGN and others working towards connecting their first biogas producers later this year, IGEM (Institute of Gas Engineers and Managers) asked GDNs (including NGN) to help develop new standards and guidance documents designed to regulate the quality of gas that will be injected into the system and outline a protocol for safe injection practices.

Working together, IGEM, NGN, Wales and West Utilities, Scotia Gas Networks and National Grid Gas Distribution are producing three documents explaining the legislative and standard requirements surrounding biogas pipelines, biomethane injection into the gas distribution network and the safe and reliable collection of onshore shale gas:

- IGEM/TD/16 – standard for biomethane injection into the gas distribution network.
- IGEM/TD/17 – standard for biogas pipelines.
- IGEM/G/101 – guidance document.

Production of these documents is ongoing and we hope to have them finalised in autumn 2014.

The development of the standards and guidance documents will provide a common understanding and set of requirements for the gas industry. It will also provide reference material for the waste industry, renewable industry and commercial developers.

3.2.3 Lessons learnt

Despite the notable successes achieved in 2013/14, the first year has not been without its challenges. We've come up against a number of hurdles, but finding innovative solutions to these ensures we will do things even better next year.

Implementation – we've struggled at times to implement successful innovation projects into business as usual and set up the required commercial frameworks while ensuring they also comply with current standards and procedures.

Collaboration – we've realised the importance of leveraging the skills of our colleagues at other GNDs and industry associations, but we've also set up a cross utility collaboration forum working with utility companies from across our region to explore transferable technology and experiences. We're currently looking at how we all respond to emergency situations so we can develop a resilience best practice process, for example.

Tendering – a key benefit of the NIA is being able to tap into the innovation of SME organisations that wouldn't normally be on our radar, but this new way of harnessing external expertise isn't necessarily supported by the Competition Act and our internal tendering processes. We've explored ways of making things work, but there are still areas that we need to address as an industry if we're going to be able reap the full rewards from the scheme and support our SME innovations partners.

Impact of standards – with little innovation having taken place in our industry over the past 25 years, it has been challenging to trial new technology on the network when there are no policies in place and even more challenging when we've needed to amend a pre-existing procedure.

3.3 Network Innovation Completion (NIC)

Our aim is to submit at least one NIC project for assessment in every year of RIIO. In order to achieve this we have developed a structured multi stage approach to developing NIC projects. We have established several target areas to generate and assess project ideas, and then use the NIA in order to further develop appropriate projects. We are also working in collaboration with Wales and West Utilities and the Energy Innovation Centre to maximise idea generation and increase the chances of a successful outcome.

We were delighted to be successful with our first bid under NIC being awarded funding of £4.9m for low carbon pre-heating.

3.3.1 Low carbon gas preheating project overview

The transition to a low carbon energy sector in the UK presents GDNs with a number of challenges, including reducing the business carbon footprint (BCF) of operating gas networks. The requirement for GDNs to preheat gas at pressure reduction stations (PRS) to avoid freezing the outlet pipework and ensure continuity of supply is a significant contributor to our BCF. GDN's preheating requirement is currently delivered using aging water bath heaters (WBH) or more modern boiler package technologies.

There are several key issues GDNs currently face when appraising investment options for preheating technology. Firstly, the whole life costs and in particular the carbon impact of currently available technologies is not understood. Secondly, there has been limited research or development in this area resulting in no financially viable alternative to existing technologies.

The low carbon gas preheating (LCGP) project seeks to address these issues directly. The project will install two 'alternative' preheating technologies across six NGN sites of differing scale - three Thermo Catalytic Systems (HotCat) and three Low Pressure Steam Systems (LP Steam).

Smart metering technology will be installed on each of the six sites to provide data required to calculate and publish the system efficiency of each site and each technology. Additionally, smart metering technology will be installed separately on six sites that employ existing technologies. System efficiencies will be calculated and published for direct comparison.

In April team members were invited to the 2014 Energy Innovation Awards where one of NGN's partners in this project, ProHeat Systems Ltd, collected the Best Network Improvement Award for their 'ultra efficient preheating concept'.

The team have already procured one 'small' and one 'medium' sized unit from Proheat and will be installing a further 'large' unit in 2015.

3.3.2 2014 Shale project NIC bid

Recent years has seen an increase in the potential for production of on-shore unconventional gas sources in the UK. These bring with them potential benefits in terms of security of supply, facilitation of the transition to a low carbon economy and direct customer benefit from access to the wider energy market. There are a number of challenges to address if these benefits are to be captured and maximised. Key amongst these is how the UK's gas transportation system and the associated commercial and regulatory framework can be most efficiently utilised, developed and operated to support these developments. To address these issues, we are submitting an NIC project in 2014 that will:

- Develop detailed scenarios that simulate the investment options that will be faced across a range of potential production capacities and geographical locations;
- Develop a system comprising several key elements - an economic model, a decision-tool, a simulation model and a scenario costing tool. Together they will allow modelling of the cost-benefit profiles for the full range of identified scenarios against a wider set of investment criteria. These include financial, economic, environmental, social and temporal factors. The project will also include new analysis that provides accurate estimates of low flow conditions on the distribution network; and
- Identify and propose a regulatory and commercial framework required to deliver the identified investment options that present the business case for development.

3.4 Innovation Roll-out Mechanism

We currently have no projects which would currently qualify for funding under the Innovation Roll-out Mechanism.

Costs, Workloads & Uncertainties

4

4.1 Introduction

This section details our approach to performance improvement, and how we've used this to both drive efficiencies and to meet our output targets. In particular we consider the impact on our key expenditure areas – operating costs and investment expenditure on capital and replacement projects.

We show changes from 2012/13 where appropriate and compare against our cost allowances. We provide forecasts of our future costs.

We also consider the areas that have experienced operational change in 2013/14, as well as what real price effects have impacted on us in the year.

Lastly, this section provides an update on the cost uncertainties contained within our price control which would allow us to use the re-opener trigger mechanism.

4.2 Performance Improvement and Efficiencies

4.2.1 Approach to benchmarking and performance improvement – in year and future

NGN is increasingly recognising the importance of understanding how companies in a range of sectors outside utilities are run, helping us be the best at what we do. In order to achieve this we are providing our colleagues with a number of opportunities to visit different businesses, both in our local geography, nationally and internationally.

The emphasis is on providing these opportunities to the people who can learn the most and compare what they see to specific activities in NGN. In particular, colleagues from our Inspire network and the Young Person's Network often lead these visits.

National

A visit to 'Pets at Home' provided our connections team with ideas for the work they were doing with the people in their teams. In particular, putting the customer at the heart of everything they do and having strong relationships between all colleagues that influence the end to end customer experience.

We learnt that Paddy Power have implemented the same system NGN were considering implementing to manage the dialogue we have with customers across all work activities. Seeing the system work in real time and listening to some of their call centre staff about the pros and cons helped us make the decision to move forward and embed this system here at NGN.

Moneysupermarket.com have set up a unique approach to agile working, in the context of delivering technology solutions and capabilities into the organisation. NGN are beginning to apply this agile model, which means we will be releasing small bits of technology frequently to give business benefit, rather than implementing traditional IT programmes over several years. Moreover we will adopt this approach to other aspects of business improvement, not just technology.

Green Road is a technology which provides real time information to a driver on the quality and safety of their driving, as well as creating a central record of habits over time.

Iron Mountain have been using the product for a couple of years and meeting with them helped us appreciate the amount of time that is needed to use the data for valuable coaching sessions with drivers, rather than just sending out a report. This will enable us to maximise the potential opportunity to have a positive effect on driving habits within the company.

Other visits included:

- M&S (Customer experience and raising interest in the utilities sector);
- Engine (service design);
- Gartner (the digital revolution); and
- Microsoft London (CRM System).

Regional

Yorkshire Bank (YB) demonstrated the complexity of managing the customer experience across multiple brands. Their system was key to this, but we learnt that balancing the system with a network of customer coaches, who help colleagues with their customer engagement, made a huge difference. The system also allowed them to get immediate feedback from customers via text. YB are due to visit us in return, to learn about how we have embedded a 90% in 60 minutes approach to customer complaints.

Attending the Yorkshire International Business Convention provided an overview of the key issues facing the region and country in terms of skills gaps, particularly in engineering. It has reinforced the work we are doing in recruiting new colleagues and training them, as well as contracting local engineering firms for our replacement programme.

Port of Tyne demonstrated how a not for profit organisation can work in a competitive market; investing in their asset to provide a range of services to customers; passengers; and vehicle and fuel transporters. This was a useful demonstration of asset management in a different industry.

Utilities

NGN has relationships with a range of colleagues in Wales & West Utilities (WWU) and Northumbrian Water Limited (NWL). This is encouraged by our shareholders so that we can apply different ideas, where appropriate, to our organisations. They do not want us to all be identical. So far, we have tended to pick up small, but very useful ideas from each other; we have adopted the winter reservist idea from WWU to improve resilience in winter. Furthermore, we have similar work management improvement projects to NWL so have learnt how each business involves their extensive field based workforces in designing and introducing system and technology changes.

From the wider CKI Group, we have had visitors from utilities in Australia to learn about how we have prepared for the RIIO-GD1 regulatory period, including our commercial model, operating model and approach to customer experience and safety.

We have hosted visitors from Osaka Gas (Japan) over the last 18 months. Osaka Gas (OG) have a particular interest in the customer experience NGN provide, our commercial arrangements, regulatory environment and approach to replacement prioritisation. These visits have helped us develop a trusting and worthwhile relationship with OG, which resulted in them inviting some colleagues to visit their network in Japan in June 2014.

This provided a useful comparison to the UK, in particular showing just how much progress has been made with commercial performance and customer service. The team also gathered some ideas about specialist technology and appliances, data used to inform the repair and replace programme, as well as people development and change management. Moreover, it served to demonstrate the positive impact unbundling of utilities and the regulatory framework has had here in the UK.

Whilst visiting organisations from a range of different industries serves as a valuable source of ideas for NGN, it is also a way of energising our colleagues to constantly review how we do things and look for ways to improve the way we do business.

These opportunities are also an important part of personal development and a chance to get to know other colleagues across a business that can in part be quite dispersed. We are looking forward to continuing to develop the relationships we have with these businesses, and indeed starting new ones throughout RIIO-GD1.

4.2.2 Cost benchmarking

Cost benchmarking is the method used by Ofgem to compare costs across the GDNs based on their workloads. This is a comparative analysis which allows NGN to measure the efficient level of costs.

To evaluate our individual efficiency in 2013/14, we applied the same econometric technique (as for RIIO) on Totex, Disaggregated activities, as well as Opex and Capex levels assuming that other GDNs remained where they were in 2012/13.

The provisional benchmarking results show that NGNs Totex individual efficiency has improved from 2012/13 to 2013/14. We therefore expect to maintain our frontier efficiency position. This is consistent with previous years where NGN has been benchmarked as the best performing GDN.

4.2.3 Real Price Effects (RPE)

Allowed revenues are indexed by the Retail Price Index (RPI) as part of RIIO-GD1. However, it is expected that the price of several inputs, most notably labour, will not change in line with RPI inflation. To account for this differential, our allowances are based on forecasted differences between economy-wide inflation, as measured by the RPI, and input price inflation, which is known as the Real Price Effect (RPE). In other words, RPEs represent the actual change in input prices over and above the level of inflation in the economy.

Specifically, RPE is calculated by the following formula:

RPE =
Input Price Inflation minus
Retail Price Inflation

The approach used to setting RPEs over RIIO-GD1 was to draw on outturn data and short term wage growth forecasts using the latest forecasts published by HM Treasury, and use the real average historical rate for relevant input price indices for all other years.

- **Labour RPE forecasts**

For labour costs, which comprise around 60% of NGN's costs, forecast RPEs are based on independent forecasts for wage growth over the short term. This indicates negative real wage growth and an assumption that real wage growth will revert to the long term trend of 1.3% per annum from 2014/15 onwards.

For 2013/14, allowances were based on negative labour RPE of (0.2)% following two years of negative real wage growth as shown in the table below.

	Proportion of Totex	11/12	12/13
GDN labour (%)	64.0%	(2.9)%	(0.8)%

Figure 4.1: Labour RPEs (year on year change) price control allowance

- **Labour RPE actuals**

During the year the average wage settlement across the business was 2.9% which is in line with inflation and above the level assumed in setting our allowances. However, this needs to be considered against the wider measures we have adopted to bring our remuneration arrangements in line with the wider economy and improve efficiency. This package of measures includes:

- In 2012, NGN introduced revised terms and conditions of employment applicable for new entrants and those existing employees who were promoted internally. The objective of the refreshed remuneration package is to drive efficiency improvements and achieve our outputs. Base pay levels are reduced, weekly contracted hours are increased and occupational sick pay was more reflective of the market, moving away from the historically generous arrangements in place for many utilities and local government schemes;
- In line with our ambition to be the best at all that we do, we are striving for increased productivity and output levels and a customer-focused culture of right first time. To help this approach we have also introduced a number of process specific incentive schemes. These are designed to incentivise colleagues to deliver excellent customer service, adopting a culture of safety first, ensuring the work is undertaken in the most efficient way possible and that all records are accurately maintained at the end of each piece of work.
- As we amend our remuneration packages to better reflect the appropriate reward strategies, we are quickly moving to a position where those employees within corporate / central functions are generally all retained on personal contracts. This allows us to incentivise them, setting specific personal objectives and achievements recognised with an annual bonus. This methodology keeps base salary levels at a reasonable level and provides us with the flexibility to reward performance on an annual basis, thereby not increasing the overall salary bill on an enduring basis.

We have adopted an approach of separating pay from other terms and conditions and will not return to a situation whereby we negotiate on a basket of issues. Historically we have found this can inflate the overall cost base if enduring controls are not in place.

- **Non-labour RPEs**

For RIIO-GD1 RPEs for Capex and Repex materials were assumed to have a positive change of 1.7% from 2013 to 2014. This assumption is based on an unweighted average of PAFI indices for steel works, plastic pipes and copper piping.

Our analysis of RPE is based on ICIS index changes and the impact on material price changes from 2013 to 2014 is summarised in the table below. This has seen a reduction in costs driven by slower than expected economic recovery and lower oil prices.

	13/14 outturn
PE pipe	(2.202)%
PE fittings	(1.619)%

Figure 4.2: Material price changes from 2013 to 2014

4.2.4 Organisational changes

To deliver a more efficient organisation we have made a number of changes to our organisation. These include:

- Invested in offering early retirement to those over 55; enabling recruitment and internal promotion of other colleagues;
- Introduction of over 50 new emergency and repair colleagues on modern terms and conditions, including flexible shift patterns and an incentive scheme for productivity, safety and customer performance;
- In July 2013 new site start and finish arrangements were agreed with our direct labour colleagues for repair activities;
- Continued to expand the Direct Service Provider (DSP) delivery model for replacement so it is now established in seven of our nine geographic areas, retaining one of our intermediary contractors for the other two;
- Established a dedicated support service for DSPs, including customer and stakeholder support, communications, plant and equipment;
- Brought the construction of connections jobs back in house from an intermediary contractor and structured it around our nine area geographical model;
- Taken supply chain down from 1,500 to 700;
- Engaged with the supply chain and started tendering for the majority of maintenance activities to be outsourced (ongoing); and
- Invested significant amounts of time in changing the culture of the organisation; listening to, energising and involving the organisation in improving the business (ongoing)

4.3 Operating expenditure and workload

Operating expenditure (Opex) is categorised depending on whether it is within the direct control of NGN or not. Non-controllable costs include such things as Ofgem's licence fee, network rates and the NTS pensions deficit recharge.

Controllable Opex is then split into two categories;

- Direct Opex – covering work management, emergency, repair, maintenance and other direct activities; and
- Indirect Opex – covering training and apprentices, and then business support activities, such as finance, human resources, and IT.

Each category of Opex is considered in the following section in conjunction with workload where appropriate.

4.3.1 Controllable Opex compared to the allowance

Overall our controllable Opex costs in 2013/14 were £80.6m, outperforming the allowance of £96.3m by £15.7m.

This outperformance will be shared with our customers under the Totex sharing mechanism. It is important to remember that the allowances are benchmarked against the other GDNs, and as the frontier performer, the allowances we have been set are in some cases higher than our base costs.

4.3.2 Controllable Opex and workload

The table below summarises the year on year cost movements by activity type for controllable Opex.

Controllable Opex 2013/14 prices (£m)	2012/13	2013/14	Variance
Direct Opex			
Work Management	14.1	13.4	(0.7)
Emergency	9.5	9.8	0.3
Repair	20.1	16.4	(3.7)
Maintenance	8.8	8.3	(0.5)
Other direct activities	6.4	6.8	0.4
Direct Opex total	**58.9**	**54.7**	**(4.2)**
Indirect Opex			
Business Support costs	21.5	23.5	2.0
Training and Apprentices	2.1	2.4	0.4
Indirect Opex total	**23.6**	**26.0**	**2.4**
Total controllable Opex	**82.4**	**80.6**	**(1.8)**

Figure 4.3: Controllable Opex year on year variance

Overall we have achieved a real cost decrease of £1.8m. Direct Opex has seen a £4.2m saving, but this has been offset by increased cost pressures in indirect Opex.

4.3.3 Direct Opex

The table below summarises the year on year cost movements by activity type for direct Opex.

Direct Opex 2013/14 prices (£m)	2012/13	2013/14	Variance
Work Management			
Asset management	1.3	2.5	1.1
Operations management	8.1	8.8	0.6
Customer management	2.9	0.6	(2.3)
Systems control	1.7	1.5	(0.2)
Emergency	9.5	9.8	0.3
Repair	20.1	16.4	(3.7)
Maintenance	8.8	8.3	(0.5)
Other direct activities	6.4	6.8	0.4
Direct Opex total	**58.9**	**54.7**	**(4.2)**

Figure 4.4: Direct Opex year on year variance

Work management overall has seen a £0.7m year on year reduction in costs across the four activities included here. This overall reduction is driven by;

- An increase in costs in asset management of £1.1m. £0.7m of this increase is as a direct result of gasholder demolition costs being recorded here, the balance being an increase in net staff costs and professional and consultancy costs to support our Total Network Management (TNM) approach to asset management strategy;
- An increase in operations management of £0.6m. £0.3m of this increase is for one off professional and consultancy costs, which involved reviewing and improving our work planning activities. This has delivered new performance metrics, a new planning hub to efficiently plan, dispatch and review workload volumes, as well as stream-lining the maintenance management structure. The balance is due to increased management and costs associated with survey work, which varies year on year, and sample inspections by local highway authorities;
- A decrease in customer management of £2.3m. This is entirely driven by a contractual rebate payment from National Grid for call handling services which were paid for in previous years. This will not reoccur and so we would expect costs to return to previous levels in future years; and
- A decrease in system control costs of £0.2m, driven by reduced headcount and increased efficiencies in delivering the service.

Emergency and repair costs have shown a combined decrease of £3.3m, whilst achieving a very strong performance in our emergency and repair outputs;

- Greater than 99.8% performance for attending both controlled and uncontrolled gas escapes within 1 and 2 hours respectively, against a target of 97%;
- Annual repair risk of 34,357,029 against a target of less than 34,495,899; and
- 62.3% of repairs completed within 12 hours, against a target of 60%.

We experienced a mild winter in 2013/14 which has impacted workload, and hence performance, overtime payments and contractor costs. This was offset by the very wet weather experienced, which has led to an increased incidence and impact from water ingress.

In terms of workload, the number of public reported escapes dropped from 100,138 in 2012/13 to 89,290 in 2013/14. This also resulted in a decrease in repairs from 26,169 in 2012/13 to 25,198 in 2013/14.

Regardless of both of these impacts, we have taken significant steps to improve our efficiency and delivery in these activities. These include;

- The introduction of new terms and conditions for both existing and upskilled employees, as well as new starters. This includes the introduction of 'site start' and 'site finish' working patterns, as well as new bonus arrangements, which are now specifically linked to outputs;
- Revised contractual arrangements and focused management of street works and reinstatement to improve response times and efficiency. Street works costs alone have decreased £1.1m year on year as a result of business improvements;
- The targeted upskilling of first line managers, including support towards Institute of Leadership and Management accreditation. We have also introduced a regional coaching structure to support this;
- The introduction of new vehicle telemetry to improve driving behaviour, impacting safety and efficiency; and
- The introduction of a centralised plant 'desk' to manage all aspects of plant usage.

Maintenance costs have reduced by £0.5m, mainly as a result of the investment detailed under operations management above, which has enabled us to reduce the use of contractors and replace them with correctly skilled direct labour, using their time more efficiently.

Other direct activities has increased by £0.4m. This is driven by increased expenditure on materials and we expect this to return to more consistent levels in future years. We have experienced an increase this year due to restocking following transfer to a new service provider.

4.3.4 Indirect Opex

The table below summarises the year on year cost movements by activity type for Indirect Opex.

Indirect Opex 2013/14 prices £m	2012/13	2013/14	Variance
Business Support			
IT and telecoms	8.7	10.5	1.8
Property management	2.0	1.1	(0.9)
Human resources	0.6	0.6	0.0
Audit, finance and regulation	3.4	3.7	0.4
Insurance	3.3	3.5	0.2
Procurement	0.2	0.2	(0.0)
CEO and group management	3.3	3.9	0.6
Training and apprentices	2.1	2.4	0.4
Indirect Opex total	**23.6**	**26.0**	**2.4**

Figure 4.5: Indirect Opex year on year variance

Indirect Opex overall has seen a £2.4m year on year increase in costs across business support, and training and apprentices. This overall increase is driven by;

- A £1.8m increase in IT and telecoms, following a competitive tender for our combined requirements in this area. This expenditure includes a cost of change associated with re-engineering our IT and telecoms supply chain. We have also added a new role: Innovation, Improvement and Technology Director, who will be responsible for managing this key area of expenditure and its relationship with capital expenditure.
- A £0.9m decrease in property management expenditure. The majority of this decrease (£0.7m) is directly driven by a contractual rebate for facilities management services. This is a one off payment and we expect costs to return to around previous levels in future years;
- A £0.4m increase in audit, finance and regulation costs. £0.2m of this increase is due to an increase in headcount in our transactional accounting activities (accounts payable), with the balance being driven by increased costs for professional and consultancy services, which vary each year due to the one-off nature of much of this activity;
- A £0.2m increase in insurance, primarily due to variances in the number and level of historic compensation claims received and paid; and
- A £0.6m increase in CEO and group management costs, primarily as a result of increased expenditure on business communications, corporate social responsibility and stakeholder management - all of which have been made a priority focus for NGN as a key employer and influencer in the North of England. We have expanded our internal resources in this area to maximise our opportunity to make a positive contribution.

4.3.5 Non-controllable Opex

The table below summarises the year on year cost movements by activity type for non-controllable Opex.

Non-controllable Opex 2013/14 prices £m	2012/13	2013/14	Variance
Ofgem licence	1.3	1.5	0.2
Network rates	35.4	35.3	(0.0)
NTS exit costs	5.6	6.7	1.1
Shrinkage	10.0	8.6	(1.4)
Pension scheme administration costs	0.0	0.0	0.0
Established pension deficit recovery plan payment	9.6	7.8	(1.8)
PPF levy costs	0.1	0.1	(0.0)
NTS pension recharge	4.4	4.8	0.3
PPF levy costs	0.1	0.1	(0.0)
Network innovation (excl. IRM)	1.0	1.4	0.3
Innovation roll-out expenditure (IRM)	0.0	0.0	0.0
Bad debt	0.0	(0.1)	(0.1)
Non-controllable Opex total	**67.4**	**66.0**	**(1.4)**

Figure 4.6: Non Controllable Opex year on year variance

Overall non-controllable Opex costs have decreased £1.4m in real terms. The key variances are;

- A decrease in gas shrinkage costs due to reduced gas prices and our improvement in leakage performance;
- A decrease in pensions deficit recovery plan payments, due to phasing of payments; and
- An offsetting increase in NTS exit costs due to increased charges from National Grid.

4.3.6 Opex forecasts

NGN has consistently been a frontier performer on operating expenditure, and will look to maintain this position throughout RIIO-GD1. The table below summarises our forecasts for both controllable and non-controllable Opex for RIIO-GD1.

Opex forecasts 2013/14 prices (£m)	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	TOTAL
Direct Opex									
Work management	13.4	15.9	15.9	16.5	16.5	16.4	16.9	17.3	**128.8**
Emergency	9.8	9.8	9.7	9.7	9.6	9.5	9.5	9.5	**77.1**
Repair	16.4	16.0	15.6	15.2	14.7	14.3	13.8	13.2	**119.2**
Maintenance	8.3	8.3	8.3	8.2	8.2	8.1	8.2	8.2	**65.9**
SIUs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Other direct activities	6.8	6.5	6.4	6.2	6.1	6.0	6.0	5.9	**49.8**
Of which Xoserve	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	**30.3**
TOTAL	**54.7**	**56.5**	**55.9**	**55.8**	**55.0**	**54.4**	**54.3**	**54.2**	**471.1**
Indirect Opex									
Business support	23.5	22.4	21.7	21.7	21.6	21.5	21.5	21.4	**175.4**
Training/apprentices	2.4	2.9	3.0	3.1	3.1	3.0	3.1	2.8	**23.4**
Total	**25.9**	**25.3**	**24.8**	**24.8**	**24.7**	**24.6**	**24.6**	**24.2**	**198.8**
Total controllable	**80.6**	**81.8**	**80.7**	**80.6**	**79.7**	**79.0**	**78.9**	**78.4**	**670.0**
Non-controllable costs									
Licence/network/other	46.0	47.4	48.2	48.1	48.0	46.3	46.3	46.3	**376.6**
NTS exit costs	6.7	8.5	8.0	8.9	12.0	11.4	11.1	10.7	**77.3**
Shrinkage	8.6	7.1	7.5	7.3	7.1	6.9	6.7	6.5	**57.7**
NTS pensions cont.	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	**38.1**
Total non-controllable	**66.0**	**67.7**	**68.5**	**69.0**	**71.9**	**69.4**	**68.9**	**68.3**	**549.8**

Figure 4.7: Opex forecasts

Work management increases from £13.4m to £17.3m over the period, a real increase of £3.9m. This is driven by two factors;

- 2013/14 includes a £2.3m contractual rebate payment from National Grid for call handling services, which will not reoccur and is the primary reason why costs increased from £13.4m to £15.9m in 2014/15;
- 2013/14 includes £0.7m for the demolition of one gasholder. We are forecasting the number of gasholders demolished to increase over time and achieve a total of five demolitions in 2020/21 at a cost of £2.9m, a £2.2m increase; and
- We expect to achieve real efficiency savings of £0.6m over the period.

Emergency and repair show a combined forecast reduction of £3.4m over RIIO-GD1. This reduction is in line with our expectations within our business plan and is driven by targeted efficiencies including:

- Rebasing terms and conditions for our direct labour new or promoted staff;
- Rationalisation and efficiencies by refreshing our supply chain; and
- Operational efficiencies across the repair process including reinstatement and plant hire costs and improving works management and overtime controls.

We are also forecasting more than £1m real savings across maintenance and other direct activities over RIIO-GD1.

Within business support we are forecasting a £2m saving across the activities, primarily driven by reduced IT and telecoms expenditure, as well as reduced professional and consultancy costs.

Training and apprentices expenditure follows our expected recruitment plans and demonstrates our commitment to reinvigorating our workforce and investing for the future.

4.4 Replacement expenditure and workload

Replacement (Repex) activities are generally associated with the replacement of old metallic pipes which potentially cause a safety risk if the pipe fractures and allows gas to escape. Pipes are generally classed as a main, serving a number of customers, or a service, which typically connects the main to a customer's meter.

The majority of work is split into different tiers of main based on diameter band, with any associated services collected against the appropriate tier. For further details on this please see section 2.2.1. The remainder of the work consists of diversions, risers and sub deducts.

4.4.1 Repex compared to the allowance

The table below sets out our 2013/14 Repex costs and workload, along with the cost allowance.

Overall we spent £88.3m against an allowance of £96.9m, a 9% saving that will be shared with our customers under the Totex sharing mechanism. We achieved this whilst delivering all of the associated outputs as detailed in section 2.

In particular we significantly outperformed the annual average risk removed output target of 13,898 by removing 43,130 of risk, 39% of the overall RIIO-GD1 target. We achieved this by optimising risk reduction and delivering efficient projects.

Replacement expenditure	Net Costs 2013/14 real prices (£m)	Workload
Tier 1 – Mains laid	45.9	467.5km
Tier 1 – Associated services	16.2	34,556
Tier 2a – Mains laid	2.2	8.1km
Tier 2a – Associated services	0.1	210
Other – Mains laid	10.3	48.3km
Other – Associated services	0.7	1,582
Diversions – Mains laid	3.0	11.8km
Diversions – Associated services	0.2	273
Other services	9.7	7,551
Risers	0.1	3
Sub deducts	0.0	1
Total	**88.3**	
Allowance	**96.9**	
Variance	**(8.6)**	

Figure 4.8: 2013/14 Repex costs and workload

4.4.2 Mains and Services year on year cost comparison

In terms of year on year performance, the all in mains laid unit rate averaged £165 per meter in 2013/14 against the 2012/13 equivalent of £162 per meter. The underlying workload mix is the primary driver of this change;

- Mains moved more towards the higher diameter bands. In 2012/13 we laid c.27km of >180mm pipe (5% of the total), whereas in 2013/14 the equivalent was 40km (8% of the total). We made a strategic decision to remove higher diameter and more difficult to replace pipes at the beginning of RIIO-GD1 in order to maximise benefits for stakeholders and customers. Overall we estimate this implies a cost increase of c.£6m, or £11 per meter; and
- Services decreased proportionally by 10% year on year, offsetting some of this cost increase. This implies a cost decrease of c.£3.4m, or £6 per meter.

Overall this workload mix change suggests we should have seen a marginally higher increase in overall unit rate than achieved - £5 instead of £3 per metre. The main driver for this efficiency has been the increased use of direct contracts with end service providers, rather than through larger intermediary contractors. This both removes the profit margin of the intermediary, and allows NGN greater control of the end to end Repex process.

4.4.3 Risers (Multiple Occupancy Buildings)

NGN have an obligation to manage the risks identified with mains and services associated with medium and high rise buildings. We manage this through an ongoing program of surveys and then carry out remedial work on both a reactive and planned basis as required. In 2013/14 we have replaced three risers at a cost of £0.1m. These projects were all relatively short length and not technically challenging. We expect both costs, workload and complexity to increase in future years.

4.4.4 Sub-deducts

Sub-deduct networks present a potential safety risk as the owner and operator of these networks is not always clear.

In 2013/14 we have re-engineered one sub-deduct network to remove the identified risk, at a cost of less than £20k. Another eight sites have been identified as no longer being sub-deducts. This year we have also developed a risk based programme of works which will drive increased workload and costs in future years.

4.4.5 Repex Forecasts

NGN has consistently been a frontier performer on replacement expenditure (Repex), and will look to maintain this position throughout RIIO-GD1. The table below summarises our forecasts for RIIO-GD1.

Repex forecasts 13/14 prices (£m)	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	Total
HSE driven mains and services	64.5	60.6	58.2	56.5	56.5	56.4	53.9	53.6	**460.0**
Non-HSE driven mains and services	23.8	22.3	21.4	20.8	20.8	20.8	19.9	19.7	**169.5**
Risers	0.1	0.8	0.9	0.9	0.9	0.9	0.9	0.9	**6.5**
Repex totals	**88.3**	**83.7**	**80.6**	**78.3**	**78.2**	**78.1**	**74.7**	**74.2**	**636.0**

Figure 4.9: Repex forecasts

We expect to achieve all of our output targets through our replacement programme whilst outperforming the allowances. In particular our risk reduction and length of mains off-risk targets. This outperformance will then be shared with our customers under the Totex sharing mechanism.

We will achieve this by re-engineering our replacement programme in line with our Total Network Management (TNM) approach. In particular we will be fully utilising the added flexibility introduced in the new 3 tier approach to replacement, as well as maximising the return on this investment through a detailed cost benefit analysis approach.

In terms of the forecast cost profile above, we are introducing further efficiencies into our delivery model through expanding our commercial and operational strategy, which has already delivered benefits.

In 2014/15 and 2015/16, we are increasing the length of mains taken off-risk targets by delivering more work, which will provide us with further flexibility when managing work for the rest of RIIO-GD1. These are the main drivers for the decreasing cost profile over the eight year RIIO period, and the ramp down of costs in the final two years.

4.5 Capital expenditure

Capital expenditure (Capex) covers a wide range of investments in different types of gas network assets, as well as non-gas assets, e.g. IT and vehicles.

This investment is key in delivering many of our outputs including asset health, asset utilisation, connections and fuel poor.

4.5.1 Capex compared to the allowance

The table below summarises our actual capital expenditure in 2013/14 against the allowances by activity type. We do not provide a year on year comparison in all areas due to the project driven nature of the work.

Capital expenditure 13/14 prices (£m)	Allowance	2013/14	Variance
LTS, storage and entry	12.2	8.9	(3.4)
Connections	6.2	6.5	0.3
Mains Reinforcement	4.9	2.9	(2.0)
Governors (Replacement)	1.6	2.0	0.4
Other Capex			
Other Capex	26.5	19.9	(6.5)
Of which IS and telecoms	5.5	5.3	(0.2)
Of which vehicles	5.2	3.9	(1.3)
Capex total	**51.4**	**40.3**	**(11.2)**

Figure 4.10: Capex variance to the allowance

Overall we have achieved a saving against the allowance of £11.2m. This saving will be shared with our customers under the Totex sharing mechanism.

4.5.2 LTS, storage and entry

We have invested £8.9m in this activity against an allowance of £12.2m. Overall we expect to outperform this allowance over RIIO-GD1 due to an increased commercial focus on all Capex, as detailed in the forecast section below. A large part of the outperformance in 2013/14 reflects planning and detailed design stage work for many long lead time projects, which will begin construction over the next two years.

Our major areas of expenditure this year include;

- £4.1m on offtakes, which includes £0.9m on long lead items, primarily for a future upgrade of Wetherall offtake, £1.6m for civils upgrades at Cowpen Bewley to bring the site in line with all legislation and £0.6m for the replacement and upgrading of odorant injection systems at five sites;
- £1.2m on LTS pipelines, which includes £0.2m on transformers – rectifier upgrades, £0.2m of remediation work at Brancepath, £0.2m on PIG trap upgrades and £0.15m on ball valve upgrades; and
- £3.6m on PRS's, which includes £1.5m on electrical and instrumentation upgrades at several sites, £1.0m on various civils projects, including upgrading water bath heaters and filter bases and £0.4m finalising the upgrade of Tyersal 38-17bar regulator.

4.5.3 Connections

The table below summarises 2013/14 connections performance against the net cost allowance and performance against 2012/13 outturn.

Connections	2012/13	2013/14	Variance
Workload			
Mains (km)	15.5	19.1	3.6
Services (number)	5,849	6,310	461
Governors (number)	3	1	(2)
Risers (number)	0	25	25
Costs (13/14 prices £m)			
Mains	1.6	2.1	0.5
Services	8.0	9.0	1.0
Governors	0.0	0.0	0.0
Risers	0.0	0.1	0.1
Gross Cost	**9.6**	**11.2**	**1.6**
Contribution	(4.9)	(4.7)	0.2
Net Cost	**4.8**	**6.6**	**1.6**
Net Allowance	**-**	**6.2**	**-**

Figure 4.11: Connections workload and costs variance

Overall in 2013/14 we have spent a net £6.6m, £0.4m over the allowance of £6.2m. However the net cost in 2013/14 includes £1.9m of net fuel poor connections costs, which we do not believe is covered in the allowance. Taking this into account we would have underspent the allowance by £1.5m. It is also important to note that connections workload, and hence costs, are largely customer driven, and this demand will materially affect our performance against the fixed allowance.

Compared to 2012/13, we have laid 23% more mains and 8% more services in 2013/14, whereas our respective costs have increased by 29% and 13%. This relative unit cost increase of c.5% reflects our increased focus on customer service in this area, which has led to us materially altering our delivery model, with a short term cost increase. The outcome of this has been a significant improvement in customer satisfaction with our connections service.

4.5.4 Mains reinforcement

We have invested £2.9m in 2013/14 on mains reinforcement and associated governors, which has delivered 8.5km of reinforcement mains and four governors. This is against an allowance of £4.9m. This is at a unit cost of c.£329 per meter, marginally higher than the equivalent rate in 2012/13. It is important to remember that unit costs will vary dependant on the type, location and complexity of the projects undertaken.

Reinforcement workload is impacted by the results of the annual network validation process, which assesses what reinforcement is required to remediate projected capacity constraints. The validation is updated annually, and since the process is sensitive to localised network dynamics, the actual workload will experience peaks and troughs.

4.5.5 Governors (replacement)

We have invested £2.0m in 2013/14 on governor replacement, which has delivered 26 new district governors and 438 new service governors. This workload is higher than that contained within the allowance of £1.6m. This reflects that we have consciously decided to manage the work as a bulk programme to increase efficiencies of delivery and reduce operating and maintenance costs going forward.

4.5.6 Other Capex

We have invested £19.9m in this activity against an allowance of £26.4m. Overall we expect to outperform this allowance over RIIO-GD1 due to an increased commercial focus on all Capex as detailed in the following section, with an emphasis on plant, tools and equipment.

Our major areas of expenditure this year include;

- £5.5m on plant, tools and equipment. £1.8m of this was for the purchase of gascoseekers, which is one of our key social obligation outputs. We have also invested £1.0m in network validation loggers, £1.2m on remote pressure and control equipment, and £0.4m on valve upgrades;
- £5.4m on IT system upgrades, the majority of which was on a major SAP installation and transformation project to consolidate and upgrade onto one SAP system. We also introduced new management information and control systems;
- £3.9m on vehicles to replace ageing high mileage vehicles with new, more efficient and appropriate vehicles. This includes introducing new all wheel drive vehicles to support our winter strategy and improved on board power systems to increase efficiency in our emergency and repair activities;
- £1.7m on new IT systems in system control, primarily around offtake reform and demand management;
- £1.3m of Xoserve Capex recharges; and
- £1.1m on upgrading, relocating and refreshing our depots and offices, including moving the connections function to Sunderland.

4.5.7 Capex forecasts

The table below summarises our forecast for Capex over RIIO-GD1, all in 2013/14 real prices. NGN are forecasting to invest c.£360m of Capex, compared to an allowance of c.£390m.

Capex forecasts **13/14 prices (£m)**	**13/14**	**14/15**	**15/16**	**16/17**	**17/18**	**18/19**	**19/20**	**20/21**	**Total**
LTS, storage and entry	8.9	10.9	12.7	14.6	12.0	14.9	14.5	14.4	**103.0**
Connections	6.5	6.2	6.8	7.1	7.4	7.2	7.4	7.6	**56.1**
Mains reinforcement	2.9	1.9	3.3	4.1	4.0	3.9	3.9	3.8	**27.8**
Governors (replacement)	2.0	1.4	1.8	1.8	1.8	1.8	1.8	1.8	**14.4**
Other Capex	19.9	22.7	25.1	21.9	18.6	17.2	18.3	18.3	**161.9**
Of which IT	5.3	5.9	7.0	6.8	5.8	5.7	5.7	5.7	**48.0**
Of which Vehicles	3.9	3.5	4.2	1.8	0.1	0.1	3.7	3.2	**20.5**
Capex total	**40.3**	**43.0**	**49.7**	**49.6**	**43.9**	**45.1**	**45.8**	**45.9**	**363.3**

Figure 4.12: Capex forecasts

We fully expect to achieve all of our output targets through our Capex investment programme, in particular our asset health indices, whilst outperforming the allowances. This outperformance will then be shared with our customers under the Totex sharing mechanism.

In order to achieve this excellent performance for ourselves and our customers, we have looked to reengineer our end to end investment approach to maximise the return for minimum expense.

In particular we have introduced a more commercial focus to the end to end Capex process with specific targeted efficiencies by activity area. This now includes processes to ensure we are engineering for value, specifically through;

- Investment teams, peer review and challenges of design;
- Smarter planning to long term targets; and
- Revised and improved network analysis to identify the best long term options on a wider scale.

We are specifically targeting synergies and economies of scale across both activity area and geographic location e.g. visit a site once to upgrade all components with one contractor, as opposed to revisiting year on year. We are also using more detailed analysis of asset health, which allows us to better manage trade-offs and decisions between maintenance and replacement of assets.

LTS, storage and entry expenditure varies year on year given the major project driven nature of the work. This is a key area that will be impacted by our revised Capex management approach.

Connections includes both normal customer driven connections work and fuel poor connections. We expect connections work to increase year on year in relation to increased economic activity. Fuel poor connections expenditure follows the profile detailed in the outputs section 2.6.1, where workload increases until a peak in 2017/18 and then reduces slightly. This delivers our outputs here, and the relative front loading of the work shows our commitment to this key social obligation output.

Mains reinforcement forecast workload and costs are again impacted by expected economic growth. We are forecasting marginal cost increases until the RIIO mid-point to cover this and we are then targeting increased efficiency in this area, resulting in marginal cost savings for the rest of the period.

We are aiming to increase governor replacement workload until 2015/16 which we then expect to remain consistent for the rest of the period.

Other Capex, similar to LTS, storage and entry, varies year on year given the project driven nature of this work. Again, this is a key area that should be impacted by our revised Capex management approach, in particular for plant and equipment expenditure. The other key elements that vary materially year on year are IT and vehicle expenditure.

4.6 Uncertainties

RIIO-GD1 provides allowances that allow us to deliver the key outputs. The risk of costs exceeding these allowances is borne by NGN and its shareholders, not customers.

However, where future changes are outside of a company's control, or it is not possible to accurately forecast the level of future costs, then RIIO-GD1 re-opener mechanisms may be triggered. Such mechanisms provide additional (or reduced) revenue to cover in whole or in part the additional (or reduced) costs being incurred.

4.6.1 Site security

Site security is one of the areas where additional expenditure can be incurred as a result of security measures at critical infrastructure sites triggered by recommendations from the Centre for the Protection of National Infrastructure (CPNI).

Moreover, the Department for Energy and Climate Change (DECC) have been engaging with the energy sector over a number of years to develop a program to identify sites critical to the national infrastructure. DECC have been working initially with National Grid Transmission, who have upgraded the physical security of a considerable number of sites. DECC are now developing programs with NGN and the other gas distribution networks.

Current Position

Pannal offtake site had been previously identified as NGN's only site which would need upgrade.

NGN have presented further evidence (site capacity, loss of customers, critical industrial loads, power stations etc.) to DECC who are now considering the information. Official confirmation from DECC is expected by the end of July 2014 to specify which sites they believe need upgrading.

Future expectations

There is a probability that Elton offtake could be included along with Pannal.

DECC have not specified timescales for completing work and it is up to NGN to detail our proposals for DECC approval.

Our estimates suggest that we might incur costs of around £3m associated with Pannal upgrade, which alone would not trigger the individual re-opener threshold of £5.3m. However, it would pass the cumulative materiality threshold.

DECC have an approved audit framework in place to ensure work/cost is defined and meets their requirements, this process must be followed to ensure value for money can be demonstrated.

4.6.2 Street works

Street works will affect GDNs in different ways because costs vary considerably between networks dependent on the approach adopted by the highways authorities in each region. This is reflected in different parts of the country introducing permit schemes at different times. Therefore, an uncertainty mechanism exists to recover efficiently incurred costs associated with the implementation of permitting by additional highways authorities and lane rentals.

Current Position

During 2013/14 new permitting has not been widely implemented in the NGN area.

The Yorkshire Common Permit Scheme is still ongoing. This commenced in June 2012 covering Leeds, Kirklees, Calderdale and Doncaster, and is effective in relation to traffic sensitive streets.

After completion of a trial in late 2012 / early 2013, Leeds City Council have re-started a coring programme effective from May 2014. This scheme only involves coring reinstatement completed within the last six months.

North Tyneside have an ongoing coring programme which commenced in November 2012 that involves coring all works completed regardless of the age profile of the reinstatement.

EToN 6* (Electronic Transfer of Noticing) was implemented in NGNs region on 01 April 2014 and is the term used for the two way transmission of notices between Utility Companies and Highway Authorities.

Overall, NGN have incurred £0.2m associated with new TMA permit schemes over 2013/14.

Future expectations

North Tyneside intend to implement a Permit Scheme from November 2014 which will be effective on all streets within their boundary.

Bradford, Calderdale and Wakefield are expected to implement the Yorkshire Common Permit Scheme from April 2015 on the same basis as that currently running.

At this stage NGN is very unlikely to trigger any re-opener in this area.

4.6.3 Connections of new large loads

This covers the cost of connecting new large loads (e.g. power stations) that pass the ‘economic test’ and therefore costs are not fully recovered from the connecting party.

Over the past year we have not connected any large loads and so have not incurred any additional costs associated with this activity.

4.6.4 Changes in the connections charging boundary for distributed gas

This mechanism will only be triggered if there is a change from a ‘deep’ to a ‘shallowish’ connection boundary for distributed gas. Moving from a 'deep' to a 'shallowish' connection boundary would mean the connecting customer would no longer pay the full costs of connection up front.

Such a mechanism would result in the connecting party paying less in connection charges with the shortfall being funded by NGN.

There are no current proposals to change the connections charging boundary and therefore there are no costs incurred in this area.

4.6.5 Smart meter roll out

There are a number of uncertainties in relation to the impact on NGN from the roll-out of smart meters. The expected impacts include an increase in call volumes to the emergency response line and increased call-outs to deal with problems with our equipment (e.g. faulty ECV) discovered when a smart meter is being fitted.

Current and future position

The official national smart meter roll-out will start in 2015 but some energy companies have already started to install smart meters. However, we are not currently recording any increased costs as a result of smart meter roll-out.

4.6.6 Xoserve (central agency) review

Currently NGN, along with the other GDNs and the NTS, fully fund Xoserve and the expenditure allowances, therefore covering our expected costs in doing so.

The RIIO uncertainty mechanism relating to Xoserve costs are based on the proposed changes to the Funding, Governance and Ownership (FGO). In future gas shippers and suppliers may fund some Xoserve activities directly themselves. Should this occur then Ofgem will trigger this re-opener to reduce our allowances for Xoserve costs.

Current position

In October 2013 Ofgem published conclusions including a proposal for the industry to take these forward for future implementation. The GDN’s together with Xoserve spent the first quarter of 2014 considering these outputs in detail and in April 2014 collectively launched a new Programme Overview Board (POB) to take forward the programme of works.

Future expectations

The overall programme is unlikely to be fully implemented until April 2016 although some elements may be introduced earlier.

If as a result of this programme our costs reduce, Ofgem will trigger the re-opener to reduce our allowances for Xoserve costs.

4.6.7 Non gas fuel poor network extension scheme

There are no proposals to change the current scheme and we are not aware of any potential changes. Ofgem are due to undertake a review of the scheme at the end of 2014.

Should the review conclude the scheme should be scaled down or terminated then Ofgem will trigger this reopener to reflect the reduced requirements on NGN.

Revenue, Incentives and Customer Bills

5

5.1 Introduction

The total amount of transportation revenue NGN can collect each year is calculated in line with the amount set out in our licence.

There is an update process each year to adjust these revenues to reflect the latest costs and is inclusive of any incentive impacts (known as the annual iteration process which occurs each November).

This also ensures that monies being returned to customers are done in a timely basis – with money being returned two years after the end of each regulatory year.

The key areas that drive the amount of revenue network companies can collect are:

Base revenue:

- Revenues set out in the licence as determined by the price control settlement;
- Updated cost of debt allowance driven by the IBOXX 10 year trailing average (and the associated impact on WACC);
- Adjustments relating to Totex out / underperformance – establishing the amount network companies can keep vs. amounts to be returned to customers;
- Latest pension deficit valuations and the impact on deficit funding allowances in the future;
- Any tax allowance implications resulting from either changes to legislation or tax rate changes (subject to a materiality threshold); and
- RPI – prices are set based on HM Treasury forecasts and trued up to reflect actual RPI two years after.

Cost 'true-ups' on pass through areas:

- Costs that are 'non-controllable' are always fully funded in revenue; and
- Prices are set based on a forecast of costs and any difference between actual and forecast adjusted for two years after.

Incentives

Incentives that can increase or decrease our revenues during RIIO-GD1 are:

- Overall customer service (inclusive of customer service, complaints and stakeholder engagement);
- Shrinkage and environmental emissions volumes;
- NTS exit capacity volume bookings; and
- Discretionary rewards.

There are other incentives which are assessed at the end of RIIO-GD1 which will affect revenues in the next price control from 2021 onwards.

Customer demand

Whilst over the long term network companies can only collect what is 'allowed' (after calculating the above), there may be timing differences from year to year due to how revenue is physically collected (known as the 'K' correction factor).

The vast majority of our revenue is charged out on a network capacity basis, in terms of a pence per peak day kilowatt hour basis. Prices are set in advance of a regulatory year and include a forecast of network capacity – which always results in a slight difference once actual levels are known:

- If actual demand is lower than our forecast then we will under collect revenue – and have to collect more two years after to bridge the gap; and
- If actual demand is higher than our forecast then we will over collect revenue – and have to return income two years after.

The following sections show the detail with reference to the above and also show the impact on customer bills over the eight years of RIIO-GD1.

5.2 Customer bill impact

Figure 5.1 below shows our forecast revenue profile. Overall revenue in 2013/14 prices starts at £395m and exits RIIO-GD1 at £390m, a reduction in real terms of (1.3)%.

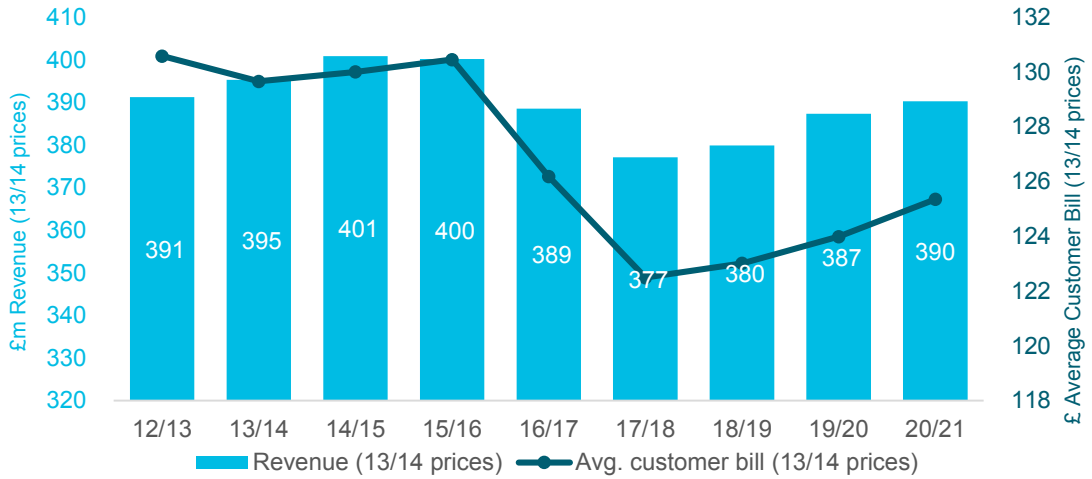


Figure 5.1: Revenue and customer bills RIIO-GD1 forecast

Applying our forward looking Annual Quantity (AQ) profile (gas demand) to Ofgem's typical domestic consumption value of 15,300kWh would result in average customer bills falling from £130 in 2013/14 to £125 by 2020/21. This represents a reduction in real terms of (3.8)%.

Assuming a 2% reduction in AQ's each year throughout RIIO, and average RPI inflation at 3.1%, results in an average price change per year of c.4.8%.

The peak year in revenue is 2015/16, driven by new accounting standards (IFRS) being introduced. These lead to replacement expenditure being capitalised – and as a result generate an extra £21m tax allowances. This impacts the annual price change needed in 2015/16 by 6.8%.

Figure 5.2 below shows the headline figures for each year of RIIO-GD1.

13/14 prices	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	Avg year
Revenue (£m)	391	395	401	400	389	377	380	387	390	**390**
Avg. customer bill (£)	131	130	130	130	126	122	123	124	125	**126**
SOQ % demand	(4.2%)	(1.4%)	(2.0%)	(2.0%)	(2.0%)	(2.0%)	(2.0%)	(2.0%)	(2.0%)	**(1.9%)**
RPI %	3.1%	2.9%	2.8%	3.0%	3.2%	3.1%	3.2%	3.2%	3.2%	**3.1%**
Price change %	10.3%	5.2%	5.1%	5.4%	1.8%	2.1%	5.8%	6.1%	6.5%	**4.8%**

Figure 5.2: NGN element of average domestic customer bill data and forecasts

5.2.1 Revenue breakdown

The revenue profile in Figure 5.3 below Includes forecasts of:

- Incentives received of c.£8.4m, which increase revenue; and
- Revenue reductions of c.£13.6m, where NGN will return income to customers.

Figure 5.3 below shows the building blocks from base revenue allowances to our final revenue charged to shippers/customers.

Note the underlying shape of revenue is largely down to the profile set out in our licence - which sees our revenue reduce in the mid years and then increase in the last three years of RIIO-GD1. The profile of catch up depreciation charges built into base revenue along with IFRS tax allowances are the biggest drivers of this trend.

13/14 prices	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	RIIO Total	Avg year
Base revenue	396	397	408	395	386	389	392	398	**3,161**	**395**
Income 'given back'										
1. Cost of debt IBOXX Index	0.0	(2.3)	(4.2)	(5.5)	(6.3)	(7.1)	(8.6)	(11.6)	**(45.7)**	**(5.7)**
2. Totex incentive mechanism	0.0	0.0	(2.6)	(2.5)	(6.0)	(5.0)	(2.7)	(2.1)	**(20.9)**	**(2.6)**
3. Pensions deficit	0.0	0.0	(0.4)	(0.4)	(0.4)	(1.9)	(1.9)	(1.9)	**(7.1)**	**(0.9)**
4. Cost pass through true-ups	0.1	0.0	(6.2)	(6.8)	(6.3)	(5.2)	(1.9)	(2.6)	**(28.8)**	**(3.6)**
5. Over collection of income (K)	(3.1)	0.0	(3.0)	(0.5)	(0.0)	0.0	(0.0)	0.0	**(6.6)**	**(0.8)**
Total 'given back'	**(3.0)**	**(2.3)**	**(16.4)**	**(15.9)**	**(19.1)**	**(19.2)**	**(15.1)**	**(18.1)**	**(109.1)**	**(13.6)**
Incentive Income										
1. Carry over from GDPCR1	0.0	3.4	1.3	1.5	1.7	1.9	2.1	2.4	**14.3**	**1.8**
2. Customer service	0.0	0.0	1.7	1.8	2.0	1.9	1.9	1.9	**11.3**	**1.4**
3. Shrinkage and env. emissions	0.0	0.0	2.6	3.4	3.5	3.5	3.6	3.6	**20.1**	**2.5**
4. Exit capacity	0.0	0.0	0.0	0.6	0.7	0.3	0.2	0.2	**2.1**	**0.3**
5. DRS (11/12 and 12/13 monies)	1.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	**1.9**	**0.2**
6. NIA (0.63% of revenue by 15/16)	1.2	1.8	2.5	2.4	2.4	2.4	2.4	2.4	**17.5**	**2.2**
Total incentives	**2.3**	**6.0**	**8.2**	**9.8**	**10.2**	**10.0**	**10.2**	**10.5**	**67.2**	**8.4**
Total revenue (£m)	**395**	**401**	**400**	**389**	**377**	**380**	**387**	**390**	**3,120**	**390**

Figure 5.3: Revenue forecasts

5.2.2 Reduction in revenue

- **Cost of debt**

The allowance within final proposals for cost of debt was 2.92%. This was based on the IBOXX 10 year trailing average index as at 31 October 2012.

This was updated to 2.72% from the November 2013 annual iteration process, thereafter we have used our own forecast for the remaining years of RIIO-GD1. This is shown below in figure 5.4.

Our long term forecast for cost of debt assumes the following:

- Actual data up to 5 June 2014;
- Thereafter no change to 10 year breakeven inflation and no change to average BBB and A credit spreads; and
- Underlying gilt yields increase in line with market expectations for future interest rates.

	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	RIIO total	Avg year
Final proposals allowance	2.92%	2.92%	2.92%	2.92%	2.92%	2.92%	2.92%	2.92%	-	-
Actual / NGN forecast		2.72%	2.56%	2.46%	2.41%	2.35%	2.25%	2.03%	-	-
Revenue impact (£m)	0.0	(2.3)	(4.2)	(5.5)	(6.3)	(7.1)	(8.6)	(11.6)	**(45.7)**	**(5.7)**

Figure 5.4: Cost of debt forecast

5.2.3 Totex incentive mechanism

Totex covers controllable Opex, Capex and Repex.

2013/14 outputs have been delivered for £36m (14%) lower than our Totex allowance of £245m. Our current forecast for RIIO-GD1 as a whole is to deliver Totex for 14% lower than allowances.

When we outperform Totex we return money to customers through the IQI mechanism. Figure 5.5 below shows our forecast outperformance and the amount we can keep (64%) and amount to return to customers (36%).

On average we will return c.£12m back to customers each year, albeit the revenue mechanics result in some being returned in year through fast money and the remainder over 45 years via slow money.

13/14 prices	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	RIIO total	Avg year
Allowance	245	252	255	252	238	238	239	238	**1,957**	**245**
Actuals / RIIO forecast	210	213	217	214	208	208	206	205	**1,681**	**210**
Variance	36	39	38	38	30	30	33	33	**276**	**34**
Variance %	14%	15%	15%	15%	13%	12%	14%	14%	**14%**	**14%**
Incentive impact (£m)										
How much NGN keeps (64%)	23	25	24	24	19	19	21	21	**177**	**22**
How much NGN gives back (36%)	13	14	14	14	11	11	12	12	**99**	**12**
When this hits revenue (2 years after, through fast and slow money, and with tax allowance restated)										
Revenue adjustment	-	-	(2.6)	(2.5)	(6.0)	(5.0)	(2.7)	(2.1)	**(20.9)**	**(2.6)**

Figure 5.5: Totex forecast vs. allowances

5.2.4 RAV

Regulatory Asset Value (RAV) represents the amount of assets that NGN own at any given point in time. It is now updated annually as part of the annual iteration process to reflect actual Totex expenditure.

Depreciation and return on RAV allowances are key elements of the revenue calculations and are dependent on the latest RAV position.

The revenue adjustments shown in figure 5.5 above rely heavily on RAV being updated – after taking into account the latest Totex forecasts the RAV position is shown in figure 5.6 below.

13/14 prices (£m)	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	Total
Opening asset value	1,825	1,820	1,820	1,834	1,851	1,866	1,879	1,886	**1,825**
Add: slow money (Capex and Opex)	42	45	48	48	45	45	46	46	**365**
Add: slow money (Repex)	44	48	52	56	62	67	70	74	**473**
Less: depreciation	(91)	(93)	(86)	(86)	(92)	(100)	(108)	(118)	**(775)**
Closing asset value	**1,820**	**1,820**	**1,834**	**1,851**	**1,866**	**1,879**	**1,886**	**1,888**	**1,888**
Difference to final proposals (£m)	(28)	(44)	(61)	(79)	(96)	(113)	(135)	(158)	**(158)**
Difference to final proposals (%)	(1.5%)	(2.4%)	(3.2%)	(4.1%)	(4.9%)	(5.7%)	(6.7%)	(7.7%)	**(7.7%)**

Figure 5.6: RAV RIIO-GD1 forecast

5.2.5 Cost true-ups

Areas where network companies receive allowances to match actual costs are shrinkage, NTS exit capacity, network rates, Ofgem license fee and NTS pension deficit. These are subject to assumptions around future NTS and gas prices.

Allowances are trued-up to reflect actual costs and the difference adjusted in revenue two years after. The forecast adjustment by expenditure type is shown in figure 5.7 below.

13/14 prices	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	RIIO total	Avg year
Shrinkage	0	0	(3)	(5)	(4)	(4)	(4)	(4)	**(25)**	**(3)**
Exit capacity	0	0	(4)	(2)	(3)	(2)	2	1	**(8)**	**(1)**
Rates / license fee / NTS pension	0	0	0	1	1	1	1	1	**4**	**0**
Revenue Impact (£m)	**0**	**0**	**(6)**	**(7)**	**(6)**	**(5)**	**(2)**	**(3)**	**(29)**	**(4)**

Figure 5.7: Pass through costs adjustments

5.3 Incentive Income/Penalties

5.3.1 Carry over from GDPCR1 – c.£2m a year

Final proposals included a forecast of GDPCR1 incentive performance for Capex and Repex outperformance.

NGN outperformed this by significantly more than forecast resulting in additional incentive income being awarded. This pot of income has been spread across years 2014/15 to 2020/21.

5.3.2 Customer Service – c.£2m a year

A very strong start to RIIO has resulted in maximum incentive income in two out of the three areas under the customer satisfaction element of the incentive.

This generates incentive income of £1.8m which we will receive in 2015/16. NGN customer service scores were, in aggregate, top of all the distribution networks.

	Actual	Target	Variance	Incentive (£m)
Planned	8.38	8.09	0.29	0.5
Unplanned	9.25	8.81	0.44	0.7
Connections	8.61	8.04	0.57	0.7
Overall	**8.75**	**8.31**	**0.43**	**1.8**

Figure 5.8: Customer satisfaction incentive impact

Our current forecast for the remaining years of RIIO is to maintain this level of performance whilst also building to achieve the maximum in planned repairs as well. Figure 5.8 shows our 2013/14 scores with cash incentive earned.

We do not expect to receive any penalties under the new complaint element of the customer service incentive.

5.3.3 Shrinkage and environmental emissions

Shrinkage volumes are 8.4% lower than allowed volumes which generates incentive income of £0.6m two years later. Based on our forecast for 2014/15 we will further outperform volumes by another 12GWh, and maintain this rate of improvement for the remainder of RIIO-GD1.

Environmental emissions volumes are 8.1% lower than allowed volumes which generates incentive income of £1.9m two years later. Based on our forecast for 2014/15 we will further outperform volumes by another 12GWh, and maintain this rate of improvement for the remainder of RIIO-GD1.

This is as a direct result of our targeted replacement programme, proactive management of our system pressures and the use of a gas agent to saturate and swell joints that leak.

Figures 5.10 and 5.11 below show this by year and when we receive the income:

13/14 prices	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	RIIO total	Avg year
Allowed GWh volumes	459	449	438	428	418	407	397	386	**3,382**	**423**
13/14 actual / RIIO forecast	421	399	388	378	368	357	347	336	**2,994**	**374**
Variance GWh	38	50	50	50	50	50	50	50	**388**	**48**
Variance %	8.4%	11.1%	11.4%	11.7%	11.9%	12.3%	12.6%	12.9%	**11.5%**	**11.5%**
Incentive (£m)	**-**	**-**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**4.0**	**0.7**

Figure 5.9: Shrinkage incentive impact

13/14 prices	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	RIIO total	Avg year
Allowed GWh volumes	434	424	413	403	392	382	371	361	**3,180**	**398**
13/14 actual / RIIO forecast	399	377	366	356	345	335	324	314	**2,814**	**352**
Variance GWh	35	47	47	47	47	47	47	47	**366**	**46**
Variance %	8.1%	11.2%	11.5%	11.7%	12.1%	12.4%	12.7%	13.1%	**11.5%**	**11.5%**
Incentive (£m)	**-**	**-**	**1.9**	**2.7**	**2.8**	**2.8**	**2.9**	**2.9**	**16.0**	**2.7**

Figure 5.10: Environmental emissions incentive impact

5.3.4 Exit capacity incentive

Whilst in 2013/14 we have not earned any incentive income from the exit capacity incentive we have now reduced our bookings by 3.6% in the July 2014 window, which will start generating incentive income of £0.6m from 2016/17.

5.4 Return on Regulatory Equity (RORE)

Ofgem use Return on Regulatory Equity (RORE) to measure the potential financial returns or penalties on the portion of the value of the company that is financed by equity.

Ofgem estimate RORE using the cost of equity (6.7%) as the starting point of their calculation as this amount is funded by Ofgem directly in revenue.

Estimates of any additional positive or negative adjustments to this figure are estimated by dividing the financial value of these adjustments by the 35% notional equity portion of RAV.

Ofgem's view is that the best performing companies should be able to earn a double digit return (>10%). Our overall RORE for 2013/14 is 10.5%, 3.8% above the baseline cost of equity of 6.7%. Totex outperformance of £36m accounts for 2.9% of this. This reflects our position as the frontier gas distribution network.

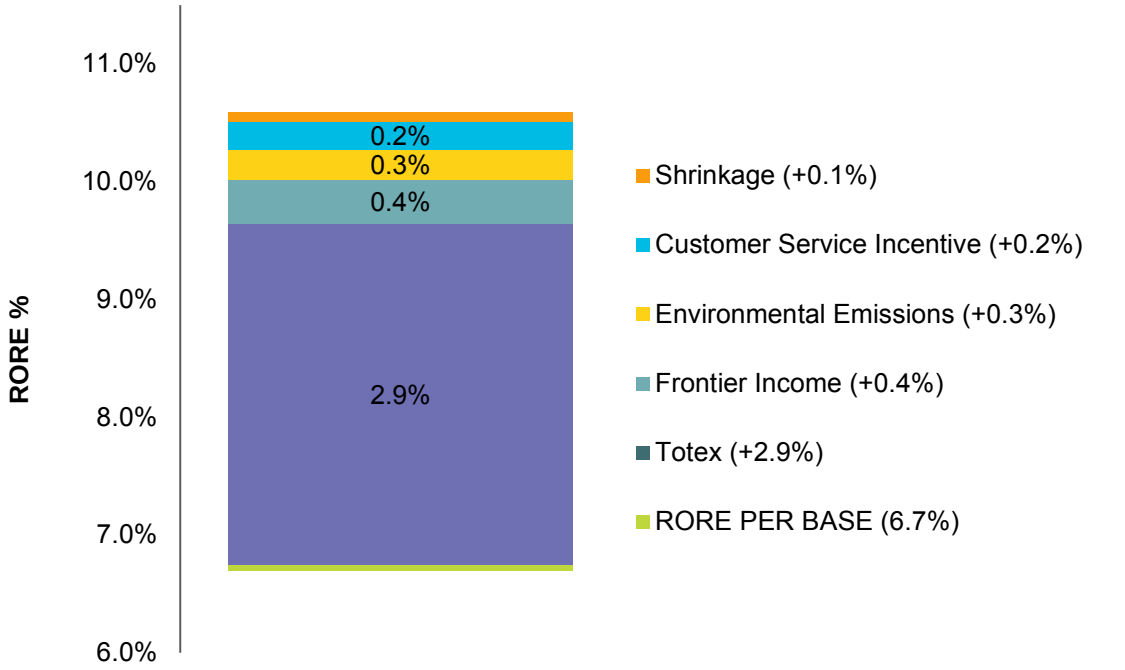


Figure 5.11: RORE graph