

**ofgem**

Making a positive difference  
for energy consumers

A stylized graphic of a gas pipeline network in shades of blue and grey. It features several pipes, valves, and flanges. One prominent valve is in the lower-left quadrant, and another is in the upper-right. A horizontal pipe runs across the middle with a valve. The background is a dark blue gradient.

**RIO Gas Transmission  
Annual Report**

2015-16

**Publication date: 24 February 2017**

**Contact: Daniel Newby**

**Team: Gas Networks**

**Tel: 020 7901 7025**

**Email: [daniel.newby@ofgem.gov.uk](mailto:daniel.newby@ofgem.gov.uk)**

## Context

---

Great Britain's gas transmission network consists of high-pressure long-distance gas pipelines and compressors, which transport gas from offshore, storage and Liquefied Natural Gas (LNG) facilities to local gas distribution networks.

There is one gas transmission owner (TO) in Great Britain: National Grid Gas plc (NGGT), which owns the high pressure gas transmission system across Britain.

In addition to its TO responsibilities, NGGT is the designated gas System Operator (SO). This means it is responsible for the day-to-day system operation, including balancing of the system and constraint management.

To ensure value for money for consumers, we regulate NGGT through periodic price controls that limit the amount by which costs can rise, and that stipulate levels of performance by NGGT.

To set our price controls we use the RIIO (Revenue = Incentives + Innovation + Outputs) framework. The latest price control was set in December 2012 and lasts for an eight-year period from April 2013 until March 2021.

We set the baseline revenues NGGT can earn at the start of the price control. There are mechanisms to adjust revenues year-on-year depending on NGGT's performance against pre-set targets. There are outputs associated with baseline revenues that NGGT must deliver either on an annual or eight year basis.

Using the data and supporting information submitted by NGGT, this report reviews how NGGT is delivering against the financial and output requirements of the price control.

## Associated documents

---

### **Reports on NGGT's performance during RIIO**

[RIIO Transmission Annual Report 2013-14](#)

[RIIO Gas Transmission Annual Report 2014-15](#)

[RIIO-T1 Performance Data](#)

[National Grid Gas Transmission Performance Summary](#)

### **Price control documents**

[RIIO-T1: Final Proposals for NGGT and NGET - Overview](#)

[RIIO-T1: Final Proposals for NGGT and NGET – Outputs, incentives and innovation](#)

[RIIO-T1: Final Proposals for NGGT and NGET – Cost assessment and uncertainty](#)

[RIIO-T1: Final Proposals for NGGT and NGET – Finance](#)

[GT1 Price Control Financial Handbook](#)

# Contents

---

<b>Executive summary</b>	<b>6</b>
<b>1. Overview</b>	<b>8</b>
<b>2. Expenditure, returns and customer bill impact</b>	<b>10</b>
Introduction	10
Total controllable expenditure (totex)	10
Actual expenditure	10
Forecast expenditure	11
Allowed revenue	11
Customer bills impact	13
Return on Regulatory Equity (RoRE)	15
<b>3. Outputs</b>	<b>17</b>
Overview	17
Safety	18
Reliability and availability	18
Customer satisfaction	20
Connections	22
Environmental	22
<b>4. Innovation</b>	<b>25</b>
Network Innovation Allowance	25
Network Innovation Competition	26
<b>5. Transmission Owner (TO) costs</b>	<b>28</b>
Overview	28
Cost breakdown	29
Load related capex	30
Non load related capex	31
Non-operational capex	33
Opex	33
<b>6. System Operator (SO) costs</b>	<b>35</b>
Totex performance	35
Uncertain costs – cyber security and data centres	36
<b>Appendices</b>	<b>37</b>
<b>Appendix 1: Determining allowed revenue</b>	<b>38</b>
Recalculated Base Revenue	42
<b>Appendix 2: Glossary for financial terms</b>	<b>44</b>
<b>Appendix 3: Data file</b>	<b>46</b>

## Executive summary

---

2015-16 was the third year of the RIIO-T1 price control for National Grid Gas Transmission (NGGT). In RIIO, the focus is on outputs, incentives and innovation as well as total expenditure (totex).

This report outlines our key findings of NGGT's performance under each of these areas to date and during 2015-16. It also outlines NGGT's updated financial and output delivery forecasts for the whole RIIO-T1 period.

### **Output performance**

NGGT has reported that it is on track to meet its outputs in all areas.

As part of our mid period review (MPR) and MPR parallel work we have reviewed two of the outputs which were set at final proposals. Following our MPR consultation last year, we have now published our decision to remove the Avonmouth pipeline output as it is no longer required.

We also published our MPR parallel work consultation where we are clarifying NGGT's compressor output. Our minded-to position is to treat the output as NGGT's responsibility to comply with environmental legislation rather than delivering specific asset solutions.

### **Expenditure performance**

#### *Transmission Owner (TO)*

In first three years of RIIO-T1, NGGT (TO) has spent £669m against an allowance of £736m, leading to an underspend of 9%. Prior to our Mid-Period Review (MPR) decision on Avonmouth, NGGT were forecasting costs over the full RIIO-T1 period (2013-21) of £2427m compared to its allowance of £2438m, an underspend of just 0.4%.

Now that we have decided to reduce NGGT's Avonmouth pipeline allowance, NGGT's forecasts indicate an overspend on their allowance by around £192m (9%). This is largely due to forecast increases in its costs associated with asset health, emissions reduction and non-operational capex costs.

#### *System operator (SO)*

NGGT (SO) has spent £259m against an allowance of £307m during the first three years of RIIO-T1 (an underspend of 16%). The majority of this is due to an underspend against its Xoserve allowance. For RIIO-T1, NGGT (SO) is forecasting costs of £756 million against an allowance of £797 million (an underspend of 5%).

### **Customer bill impact**

We estimate that gas transmission costs for an average domestic customer will be approximately £10 in 2017-18 which is broadly in line with previous years' costs. Depending on which region customers live in, transmission costs will vary between £4 and £13 for 2017-18.

### **Financial performance (RoRE)**

The financial performance of TOs is presented using the return on regulatory equity (RoRE) measure. Based on NGGT's forecast performance for RIIO-T1, we have

calculated NGGT's RoRE to be 7.84%. This estimate depends on current forecasts and future delivery of outputs and may change during the remaining years of RIIO-T1.

# 1. Overview

---

1.1. Each year we publish a report to monitor how National Grid Gas Transmission (NGGT) has performed against the outputs and allowances set as part of the RIIO-T1 price control. This reports on NGGT's performance so far and its forecast performance at the end of RIIO-T1. This is part of our overall annual monitoring process for network companies.

1.2. It is an important process in terms of holding companies to account for the money they spend and collect from consumer bills. This, and subsequent annual reports, will build the picture of NGGT's performance over RIIO-T1 and help inform the setting of the next price control. These reports will also highlight to NGGT and other stakeholders where we will be focusing our analysis in future and will allow us to engage with NGGT on specific issues as they arise. This should encourage NGGT to provide better explanations of performance in returns and provide better information to stakeholders.

1.3. In July of each year each company must submit information to us which outlines the actual costs they have incurred up to the 31 March of that year and forecast costs to the end of RIIO-T1. They must also provide written commentaries that provide further detail including cost movements since the previous year, differences between costs and allowances, and any new issues which may arise. We analyse this data and ask NGGT to clarify any areas which require further explanation.

1.4. A key change under RIIO (compared to previous price controls) is that companies are encouraged to manage their assets by looking at the most efficient long-term options. This means we hold companies to account for delivering their outputs. However, we still monitor performance against capex and opex allowances to help us understand overall totex performance.

1.5. As NGGT is the only gas transmission company, we are unable to benchmark against other companies as we do for the electricity distribution, gas distribution and electricity transmission sectors. In this report we mainly focus on its performance against its allowance in each area.

1.6. This report provides detail in the following chapters:

- Expenditure, returns and customer bill impact – This chapter explains NGGT's totex performance, its allowed revenue to date, its estimated return on regulatory equity (RORE) and the impact of allowed revenue on customers bills.
- Outputs – This chapter provides detail of how NGGT has performed against its outputs during the reporting year and how it forecasts it will perform against its outputs at the end of RIIO-T1.
- Innovation – This chapter provides information on the costs incurred for the Network Innovation Allowance (NIA) and Network Innovation Competition (NIC) during the reporting year.
- Transmission owner (TO) costs – This chapter provides further detail on the costs that NGGT has incurred so far during the price control and the costs it forecasts to incur by the end of RIIO-T1. We compare NGGT's costs against its allowances in each cost area (load related, non load related, non-operational capex and opex) to show how it is performing and the reason for any variances from allowance.



- System operator (SO) costs – This chapter provides information regarding the performance and costs incurred by NGGT as the system operator.
- Appendix 1: Determining allowed revenue – This appendix explains how we calculate base revenue and allowed revenue and some of the key components (including RAV) which make these up.
- Appendix 2: Glossary for financial terms
- Appendix 3: Data file – This appendix provides the excel data for all figures provided within the annual report.

**1.7. All costs in this annual report are provided in 2015-16 prices unless otherwise indicated.**

## 2. Expenditure, returns and customer bill impact

### Chapter Summary

This chapter explains how we determine the annual allowed revenue of National Grid Gas Transmission (NGGT) that can be collected from network charges. Within this chapter we report on total controllable expenditure (totex), allowed revenue to date, an estimate of NGGT's return on regulatory equity (RoRE) and the impact on consumer bills.

### Introduction

2.1. For NGGT we report:

- its total controllable expenditure (totex<sup>1</sup>) on maintaining and improving GB's gas transmission network infrastructure;
- its allowed revenue for these activities;
- the impact of allowed revenue on customer bills; and
- an estimate of the associated return on regulatory equity (RoRE) for investing in the gas transmission network.

### Total controllable expenditure (totex)

2.2. For each year of the price control we set NGGT cost baselines, which is its allowed totex. This is to enable investment to maintain the existing network and accommodate new network infrastructure, and to deliver agreed outputs. NGGT is required to report its actual totex, explaining its performance compared to the allowed totex and in relation to its agreed outputs annually. NGGT are also required to forecast its totex performance to the end of the price control.

2.3. Outputs are at the heart of the RIIO regulatory framework and capture the key areas within which consumers expect the delivery of high quality services. Chapter 3 gives more detail on the specific output categories.

2.4. As totex refers to total controllable expenditure, it comprises both capital expenditure (capex) and operational expenditure (opex). Therefore, NGGT is incentivised to deliver outputs based on total whole life costs, rather than being driven to prefer either capex or opex.<sup>2</sup> This incentivises it to select the best overall solutions for customers.

<sup>1</sup> Only includes controllable costs, excluding non controllable costs such as business rates, and licence fees.

<sup>2</sup> Historically capex solutions have been preferred, as the cost was capitalised and increased the regulatory asset value (RAV). Under the totex approach a company spends money on a solution, the same percentage is capitalised irrespective of whether that solution involves opex or capex. This means that companies are more likely to use the overall cost-effective solution.

## Actual expenditure

2.5. We set a totex allowance of £2.2 billion for the full eight years of the price control period for NGGT TO. The allowance for 2015-16 was £247 million, and actual expenditure was £224 million. Therefore there was an underspend of £23 million or 9%, see

2.6. Table 1. Chapter 5 and Appendix 2 give more detail on the expenditure against allowances for specific cost categories.

2.7. NGGT is incentivised to outperform its totex allowance as part of the Totex Incentive Mechanism (TIM). Through the TIM any underspend compared to the allowed totex is shared between NGGT and its customers. Therefore, efficient spending leads to better returns for investors and lower network charges for customers. Equivalently any overspend is shared between investors and customers. Under the scheme, NGGT is exposed to 44.36% of any under or overspend and the consumer is exposed to the remaining 55.64% (subject to tax).

2.8. Prior to our decision to remove its allowance for the Avonmouth pipeline project, NGGT (TO) had forecast a slight underspend of 0.4% against its allowance. Following our decision, (and using NGGT's original cost forecast) this will result in an overspend by £192 million against its allowance of £2,235 million.

2.9. Chapter 5 and Appendix 3 give more detail on the expenditure against allowances for specific cost categories.

**Table 1: NGGT totex in 2015-16**

	TO	SO
Total allowed expenditure	247	91
Actual expenditure	224	100
Overspend (underspend)	-23	8
Sharing factor (customer) <sup>3</sup>	55.64%	55.64%
Allowed expenditure after sharing <sup>4</sup>	234	96

## Forecast expenditure

2.10. Table 2 shows NGGT's performance for the first three years of RIIO-T1 and its forecast performance for the full eight years of RIIO-T1.

**Table 2: Forecast of final allowed and actual totex**

	2013-14 to 2015-16				Forecast: 2013-2021			
	Allowance	Actual	Difference	%	Allowance	Actual	Difference	%
	£m	£m	£m	%	£m	£m	£m	%
NGGT TO	735.6	669.1	-66.5	-9%	2234.9	2427.2	192.3	9%
NGGT SO	307.4	258.9	-48.5	-16%	796.7	756.0	-40.7	-5%

<sup>3</sup> This is the proportion of underspend / overspend the consumer receives (after accounting for tax).

<sup>4</sup> The allowed totex after sharing is not wholly remunerated in the year it occurs. A minority of the expenditure is funded immediately through the Fast Money part of base revenue, while the majority is added to the company Regulatory Asset Value (RAV), which is paid out over a period that is reflective of the average lifetime of long term network assets (multiple decades). Please refer to Appendix 1 for more detail on Base Revenue and RAV.

2.11. NGGT TO has underspent by 9% so far but following our MPR decision to reduce the allowance for the Avonmouth pipeline this will result in an overspend of 9%. NGGT had previously forecast a slight underspend of 0.4%.

2.12. NGGT SO has underspent by 16% so far but is forecasting an underspend of 5% over the full RIIO-T1 period.

## Allowed revenue

2.13. Allowed revenue is the total amount of money that NGGT can collect through gas transmission transportation charges from users of the transmission system. Further details can be found in Appendix 1.

2.14. Allowed revenue for 2017-18 is calculated following our price control Annual Iteration Process (AIP), which was completed on 30 November 2016. The AIP:

- determines the TIM reward/penalty based on the latest available actual expenditure information;
- accounts for changes to other factors that are updated, for example the allowance for borrowing associated with corporate debt, tax and updates through re-opener windows; and
- determines an annual modification term (the "MOD"), which modifies the Opening Base Revenue (set at the start of the price control)

2.15. Table 3 shows the allowed revenue we have determined may be collected during the price control so far. This is presented in a consistent price base and is exclusive of the reconciliation of the revenue collection correction factor. This is to improve cross-years comparisons of the consumer cost for the services provided. Also provided are details of what comprises allowed revenue in 2017-18. Note that minor constituent parts of the allowed revenue are still subject to uncertainty or are not forecast in advance (these cases are indicated in the table).

**Table 3: Allowed revenue**

		<b>TO</b>
<b>Allowed revenue<sup>5</sup></b>		<b>£m 2009-10 prices</b>
	2013-14	535
	2014-15	570
	2015-16	548
	2016-17	611
	2017-18	663
<b>2017-18 allowed revenue</b>		<b>£m nominal prices<sup>6</sup></b>
<b>Opening base revenue</b>		<b>837</b>
	MOD	8
	Non-controllable costs <sup>7</sup>	7
	Incentive payments	3
	Innovation funding <sup>8</sup>	6
<b>Correction factors<sup>9</sup></b>		
	Revenue collection	-7
	Inflation forecast true-up	-16
<b>Corrected allowed revenue</b>		<b>838</b>

## Customer bills impact

2.16. We have used assumptions consistent with those that underpin our Supplier Cost Index (SCI)<sup>10,11</sup> to provide an estimate of the cost to typical domestic energy bills due to allowed revenues for each region of GB.

2.17. Actual customer costs are sensitive to geographic region, meter type, consumption volume and the timing and duration of contracts. Our methodology is based on typical domestic consumption values (the median domestic consumer in GB). Individual consumer costs may differ significantly from these values. We report costs on an annualised basis using our latest assumptions<sup>12</sup>. Bill estimates are reported in Figure 1 and Table 4; values are reported in nominal prices and so reflect the actual typical bills rather than the real terms cost to customers. The values we

<sup>5</sup> Allowed Revenue values reported in this section of the table are exclusive of the "revenue collection" correction factor (licence term: k) and years are reported in a consistent price base. The method of calculation is otherwise identical to the method in the lower part of the table.

<sup>6</sup> This unit of money is our view of 2017-18 prices as of November 2016.

<sup>7</sup> Non controllable costs are cost items over which the company has no control. Examples include the charge levied on the company to cover the cost relating to Ofgem carrying out its regulation activities and; adjustments to business rates, such as tax, that a company cannot influence. Non controllable costs include forecast data for Independent Systems amounts paid in year.

<sup>8</sup> Innovation Funding includes the Network Innovation Allowance (NIA) as well as revenue relating to the Network Innovation Competition (NIC). The NIC revenue allowance is levied on users of the GB national transmission system. Gas network owners from distribution and transmission all participate in the same competitive process seeking to be rewarded with the funding. Regardless of who is awarded allowed revenue, it is transmission network users who are charged. Revenues that relate to innovation funding are discussed in Chapter 4. These revenues are additional to the core revenue allowance. We have assumed that the allowance for Network Innovation Allowance is the adjusted base revenue for 2017-18 multiplied by the NIA percentage.

<sup>9</sup> These reconcile previous years' actual revenue to the Allowed Revenue of those years. These are the differences between actual inflation and our forecast; and revenue collection (it is not practical to collect the exact revenue allowed owing to tariffs being set before network usage is known).

<sup>10</sup> SCI: <https://www.ofgem.gov.uk/data-portal/retail-market-indicators>

<sup>11</sup> SCI Method: <https://www.ofgem.gov.uk/publications-and-updates/supplier-cost-index-methodology>

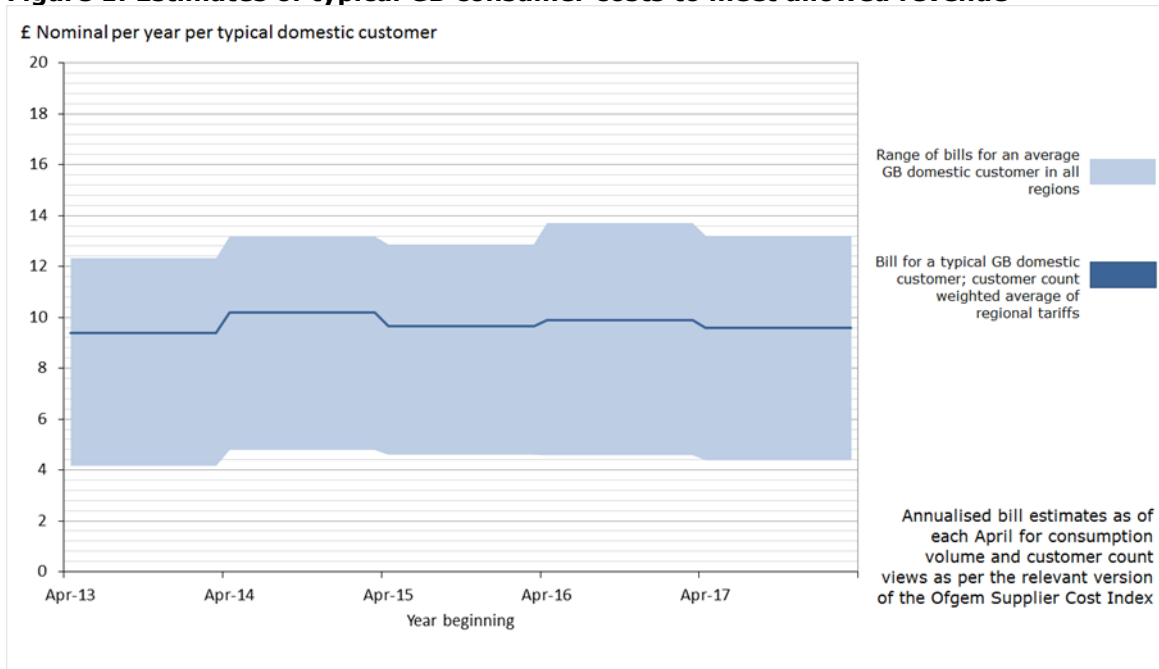
<sup>12</sup> We used the January 2017 version of our Supplier Cost Index model. Note that the SCI uses a consistent view of a typical consumer for all years, in recent years this consumption has been reducing. This and future trends in consumption are not accounted for by this analysis.

are reporting use our published typical domestic consumption values<sup>13</sup>. We have used these values uniformly for all reported years, with no correction made for recent trends in energy consumption.

2.18. While there is only a single national transmission system, consumers are charged different rates for their transmission system usage depending on which entry/exit point (interfaces between the transmission network and distribution networks) their gas comes from. The region-specific tariffs reflect the cost of enabling the transmission system to service a consumers’ particular area.

2.19. We estimate that the typical GB domestic customer will pay £10 in 2016-17 for gas transmission costs. This is estimated to remain the same in 2017-18. Charges differ considerably depending on the region that a consumer resides in. For a typical consumer 2017-18 charges are expected to range from £4 in Scotland to £13 in the North West and in the South, see Table 4 for details.

**Figure 1: Estimates of typical GB consumer costs to meet allowed revenue**



<sup>13</sup> <https://www.ofgem.gov.uk/gas/retail-market/monitoring-data-and-statistics/typical-domestic-consumption-values>

**Table 4: Regional estimates of typical GB consumer cost to meet allowed revenue (£ nominal prices per typical domestic customer).**

	2013-14	2014-15	2015-16	2016-17	2017-18
<b>GB customer count weighted average</b>	<b>9</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Region</b>					
East of England	8	9	8	8	7
London	9	10	9	10	9
North West	12	13	13	14	13
West Midlands	10	11	11	11	10
North	6	7	6	6	6
Scotland	4	5	5	5	4
Southern	12	13	13	13	13
Wales and West	11	12	10	11	11

## Return on Regulatory Equity (RoRE)

2.20. We assess the overall financial performance of network companies using a measure called the Return on Regulatory Equity (RoRE). RoRE is calculated post-tax and its estimation includes the use of certain regulatory assumptions, such as the assumed gearing ratio of the companies, to ensure comparability across the sector. To eliminate phasing impacts over the course of the price control, we use a mix of actual and forecast performance to calculate eight year average returns. These returns may not equal the actual returns seen by shareholders.

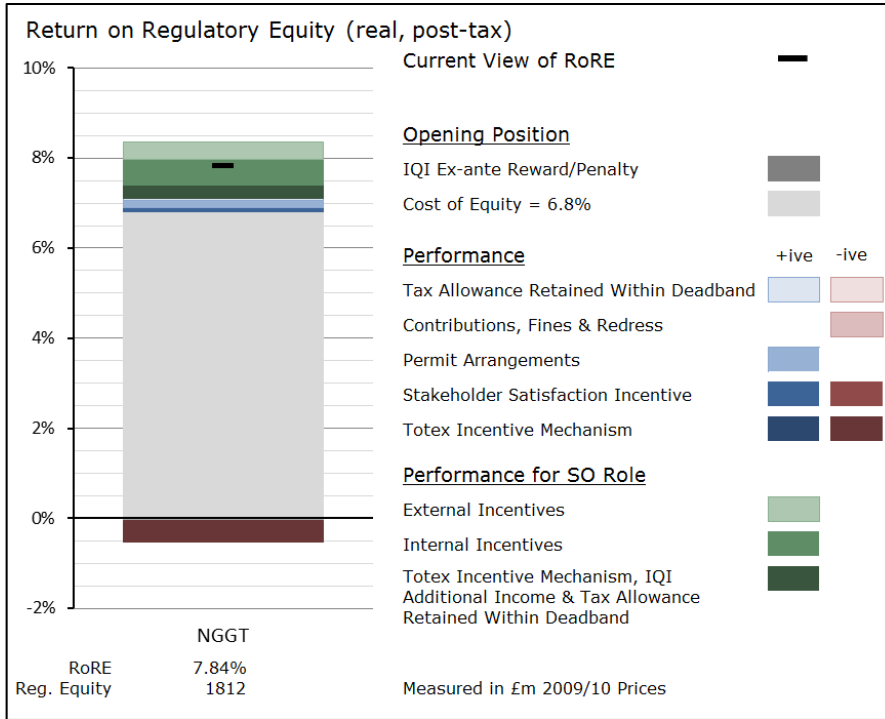
2.21. For the TIM component of RoRE, we have used company provided forecasts for the entire control period.

2.22. Our numbers include the impact of the Mid Period Review.

2.23. For the incentive rewards we have used actual post-tax values where known<sup>14</sup>. We have assumed a simple average of known (pre-tax) rewards for the remaining years, taxed at future Corporation Tax rates. Note that in some cases, holding rewards constant assumes that the underlying performance will increase over time.

<sup>14</sup> Time value of money adjustments and forecast inflation effects have been stripped out of the value of incentives. They have been taxed at the actual Corporation Tax rate applicable to the year in which the company recovers the money, which is (usually) two years after the performance.

**Figure 2: RIIO-T1 average return on regulatory equity (RoRE)**



2.24. Our RoRE should be compared to the cost of equity allowed at the start of the price control. NGGT was allowed a cost of equity of 6.8%. NGGT was given an ex-ante penalty based on its business plan quality.

2.25. Underspending against allowed totex and incentive outperformance (shaded blue) both increase NGGT’s return, while overspending and penalties resulting from underperformance (shaded red) decrease its return.

2.26. Returns are predominately driven by NGGT’s performance in its System Operator role.

2.27. As part of our periodic reviews of SO Incentives, several components of the above calculation will be under review for 2018/19 onwards. As the outcome of this review is currently unknown, and without prejudicing our decision, we have assumed incentive rewards will remain stable at pre-review levels for the latter years.

2.28. There are a number of factors which are not reflected in our RoRE calculations, but which may impact the return realised by shareholders. The largest of these are the potential end of period clawbacks for under delivery on Network Output Measures. The methodologies for these are still under development. The current calculation assumes delivery of all RIIO Outputs.

2.29. Our RoRE analysis also excludes NGGT’s actual debt costs relative to our regulatory assumption, innovation funding, legacy adjustments from prior control periods and unfunded pension deficits. We may include some of these items in the future as we continue to develop our methodology.



## 3. Outputs

### Chapter Summary

This chapter explains the performance of NGGT in meeting its output commitments over the RIIO-T1 period.

### Overview

3.1. As part of RIIO-T1, we set outputs which NGGT must deliver over the price control period.<sup>15</sup> NGGT's outputs are grouped into the following areas:

- safety
- reliability and availability
- customer satisfaction
- connections
- environmental

3.2. Within each area, we set specific metrics to allow us to measure NGGT's performance against these outputs. Table 5 summarises NGGT's performance against these for previous years, the current reporting year and forecast performance over RIIO-T1. Chapter 5 has more detail on outputs linked with network capex (eg load-related capex and NOMs).

3.3. The green boxes indicate that outputs have been met or are on target, and grey indicates outputs which we are reviewing further to see whether they are still required. Some outputs are expected to be delivered annually (eg customer satisfaction) whereas other outputs are due for delivery at the end of RIIO-T1 (eg compliance with Business, Energy and Industrial Strategy (BEIS) requirements for critical sites). The dashes indicate that the output is not due for delivery over that time-frame.

**Table 5: Gas outputs performance**

Output area	Output	Performance against outputs		
		Previous years	2015-16	RIIO-T1 forecast
Safety	Compliance with legal safety requirements	Achieved	Achieved	-
	Network output measures (NOMs)	-	-	On target
	Compliance with government requirements for critical sites by 2021	-	-	On target
Reliability & availability	System reliability	Achieved	Achieved	On target
	Avonmouth pipeline solution	-	-	Output no longer required
	NOMs	-	-	On target
Customer satisfaction	Customer/stakeholder satisfaction surveys	Achieved targets	Achieved targets	-
	Stakeholder engagement	-	6.15/10	-
Connections	Deliver additional capacity within obligated timescales	Achieved	No additional capacity required this year	-
	Connections process established through UNC 373	Met timescales	Met timescales	-
Environmental	Compressor emissions reduction solutions at Aylesbury, Huntingdon and Peterborough compressor stations to maintain compliance with emissions legislation	-	-	Output under review as part of mid period review parallel work
	Report on business carbon footprint	Achieved	Achieved	-

<sup>15</sup> Further detail of the outputs framework in RIIO-T1 is available at [https://www.ofgem.gov.uk/sites/default/files/docs/2012/12/2\\_riiot1\\_fp\\_outputsincentives\\_dec12.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2012/12/2_riiot1_fp_outputsincentives_dec12.pdf)

3.4. NGGT is meeting all of its outputs which were set at RIIO-T1 final proposals with the exception of the Avonmouth pipeline output. We removed this output requirement at our mid period review (MPR) decision in February 2017<sup>16</sup> as the output is no longer needed.

3.5. We are also reviewing the output to deliver specific asset solutions at Aylesbury, Huntingdon and Peterborough compressor stations as part of our MPR 'parallel work'. We published our consultation document on our proposals in February 2017<sup>17</sup>.

3.6. Further detail on each of the output areas is provided below.

## Safety

### Compliance with legal safety requirements

3.7. NGGT met its output to comply with its legal safety requirements. These requirements are monitored by the Health and Safety Executive (HSE). NGGT reported two serious process safety events during 2015-16 which resulted in the release of natural gas. The incidents were reported to the HSE and NGGT has confirmed corrective measures are being put in place.

### Network Output Measures (NOMs)

3.8. The NOMs output was introduced as a measure of asset health and the level of risk on the network. NGGT was funded to manage this risk and to achieve the NOMs target which is set out in its licence. NGGT forecasts to achieve its NOMs targets by the end of RIIO-T1.

3.9. NGGT is due to submit a new NOMs methodology to us in March 2017.

### Compliance with government requirements for critical sites

3.10. NGGT must ensure that critical network sites comply with government security requirements by the end of RIIO-T1. We introduced this output in our 2015 decision for the review of costs associated with the enhanced physical site security uncertainty mechanism<sup>18</sup>. NGGT has confirmed that it is on target to meet this output.

<sup>16</sup> <https://www.ofgem.gov.uk/network-regulation-riio-model/riio-mid-period-review-riio-t1-and-qd1>

<sup>17</sup> <https://www.ofgem.gov.uk/network-regulation-riio-model/riio-mid-period-review-riio-t1-and-qd1>

<sup>18</sup> [https://www.ofgem.gov.uk/sites/default/files/docs/2015/09/physical\\_security\\_decision\\_letter\\_-\\_september\\_2015\\_0.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2015/09/physical_security_decision_letter_-_september_2015_0.pdf)

## Reliability and availability

### System reliability

#### *1-in-20 obligation*

3.11. There is no specific target regarding system reliability. However, NGGT is required to meet its 1-in-20 obligations. This means that a 1-in-20 highest winter peak demand for gas can be delivered.

3.12. In Scotland, NGGT is currently working with the local gas distribution network operator (SGN) on a number of options to ensure it is able to continue to meet this output. These options include reducing Assured Offtake Pressures (AOP)<sup>19</sup> in Southern Scotland, an off-peak AOP reduction for Northern Scotland and investing in SGN's distribution network.

3.13. NGGT has deferred expenditure in this area while it assesses these options. NGGT stated that if it is unable to pursue the partial off-peak reduction option with SGN then it will start progressing alternative options on the National Transmission System (NTS)<sup>20</sup> by 2018.

#### *Avonmouth pipeline solution*

3.14. NGGT had an output to deliver a pipeline solution to manage the closure of the Avonmouth Liquefied Natural Gas (LNG) storage facility. In its RIIO-T1 business plan, this was presented as the best solution to replace the services provided by Avonmouth LNG.

3.15. Following consultation with stakeholders including the Health and Safety Executive (HSE), NGGT decided not to build the pipeline solution. This is based on two factors:

- NGGT's demand forecasts are lower than at the time we set RIIO-T1 allowances meaning the need for Transmission Support Services has reduced to the extent that investment in a section of pipeline cannot be justified.

#### **1-in-20 obligation**

NGGT has an obligation to ensure that it is able to supply gas when demand is exceptionally high (ie when demand is likely to be exceeded once in 20 years).

The decline in gas flows from the UK continental shelf through the North of Scotland, and increases in flows from other gas entry points have created challenges for NGGT to meet this obligation in Scotland.

We allowed funding for NGGT to upgrade some of its assets (eg enabling compressor stations to be able to flow gas towards Scotland) to help meet the obligation.

**Avonmouth LNG storage** site provided peak gas supplies and contingency gas supplies in the event of an emergency (eg supply failure such as loss of pipeline or compressor station).

It was owned and operated by National Grid LNG Storage (a trading division of NGG). Due to the age and condition of the plant, significant investment would have been required to keep the site running.

NGG consulted on their proposal to close the site and the decision was taken to cease operations from April 2016.

<sup>19</sup> The minimum pressure needed at an offtake to support the downstream network.

<sup>20</sup> The high pressure gas network used to transport gas throughout Great Britain.

- NGGT has reassessed its Safety Case<sup>21</sup> and has concluded that a section of the pipeline is no longer needed to meet safety requirements.

3.16. We decided to review how NGGT was meeting this output as part of our mid period review<sup>22</sup>. In our August 2016 consultation<sup>23</sup> we proposed to:

- Remove the Avonmouth pipelines output as it is no longer required, and
- Reduce NGGT's allowances by £202.9 million<sup>24</sup>.

3.17. We have considered the responses to the consultation and we published our final decision to carry out our proposal in February 2017.

## Customer satisfaction

### Customer and stakeholder satisfaction survey

3.18. Customer survey and stakeholder satisfaction surveys encourage NGGT to focus on the needs of customers and stakeholders. NGGT may receive a reward or penalty of up to +/-1% of annual revenue based upon a calculation set out in its licence.

3.19. The reward/penalty is weighted 70:30 in favour of the customer survey scores. Following our decision in August 2016<sup>25</sup>, we decided that the stakeholder satisfaction survey element would be turned off for the first three years of RIIO-T1 but would count for the remaining years of RIIO-T1. This means NGGT's stakeholder satisfaction survey score for the reporting year 2015-16 does not count towards its reward.

3.20. NGGT outperformed its targets for both customer and stakeholder satisfaction surveys in 2015-16. Its customer satisfaction survey score of 7.6 exceeds its target of 6.9 and is in line with the previous year results. For stakeholder satisfaction surveys, NGGT's scores have continued to improve with a score of 8.0 out of 10 against a target of 7.4<sup>26</sup>. The tables below show how NGGT has performed against other TOs and the gas distribution network operators (GDNs).

<sup>21</sup> The Safety Case is a document prepared by NGGT (and accepted by the HSE) which establishes adequate arrangements to prevent a network supply emergency from occurring and to manage an emergency in the event of one occurring.

<sup>22</sup> [https://www.ofgem.gov.uk/system/files/docs/2016/05/mpr\\_decision\\_document\\_final.pdf](https://www.ofgem.gov.uk/system/files/docs/2016/05/mpr_decision_document_final.pdf)

<sup>23</sup> [https://www.ofgem.gov.uk/system/files/docs/2016/08/consultation\\_on\\_the\\_mid-period\\_review\\_mpr\\_of\\_riio-t1.pdf](https://www.ofgem.gov.uk/system/files/docs/2016/08/consultation_on_the_mid-period_review_mpr_of_riio-t1.pdf)

<sup>24</sup> Referred to as £168.8 million (2009/10 prices) in the MPR decision.

<sup>25</sup> [https://www.ofgem.gov.uk/system/files/docs/2016/08/ss\\_output\\_decision\\_final\\_to\\_publish\\_4\\_aug\\_2016.pdf](https://www.ofgem.gov.uk/system/files/docs/2016/08/ss_output_decision_final_to_publish_4_aug_2016.pdf)

<sup>26</sup> This target was set out in our August 2016 decision on stakeholder satisfaction output arrangements <https://www.ofgem.gov.uk/ofgem-publications/102118>

**Table 6: Customer satisfaction survey results<sup>27</sup>**

Company	Customer satisfaction survey score (out of 10)		
	2013-14	2014-15	2015-16
<b>GDNs average</b>	8.6	8.8	8.9
<b>NGGT</b>	<b>7.2</b>	<b>7.6</b>	<b>7.6</b>
<b>NGET</b>	7.4	7.4	7.5
<b>SHE</b>	N/A	N/A	N/A
<b>SPT</b>	N/A	N/A	N/A

**Table 7: Stakeholder satisfaction survey results**

Company	Stakeholder satisfaction survey score (out of 10)		
	2013-14	2014-15	2015-16
<b>SHE</b>	6.5	7.7	8.2
<b>NGGT</b>	<b>7.8</b>	<b>7.9</b>	<b>8.0</b>
<b>NGET</b>	7.5	7.7	7.5
<b>SPT</b>	7.4	7.1	6.9

3.21. NGGT has identified areas for improvement in future years which include:

- Introducing a customer relationship management system to coordinate stakeholder engagement and improve knowledge-sharing
- Using internal workshops to review customer survey feedback and develop action plans
- Aligning customer and stakeholder strategy to the AA1000SES<sup>28</sup> stakeholder excellence standard.

### Stakeholder engagement

3.22. The stakeholder engagement reward is aimed at driving improvements in how NGGT works with stakeholders to understand their needs and priorities. There is an annual incentive of up to 0.5% of annual allowed revenue.

**Table 8: Stakeholder engagement results**

Company	Stakeholder engagement score (out of 10)		
	2013-14	2014-15	2015-16
<b>GDNs average</b>	6.56	6.21	6.38
<b>NGET</b>	5.75	6.00	6.25
<b>SPT</b>	4.90	5.50	6.25
<b>NGGT</b>	<b>5.75</b>	<b>6.25</b>	<b>6.15</b>
<b>SHE</b>	5.40	6.00	6.00

<sup>27</sup> GDN scores relate to domestic users whereas NGGT scores relate to shippers.

<sup>28</sup> [https://aa1000ses.files.wordpress.com/2011/11/aa1000ses2011\\_pre-publication-copy\\_v1-007nov11.pdf](https://aa1000ses.files.wordpress.com/2011/11/aa1000ses2011_pre-publication-copy_v1-007nov11.pdf)

3.23. NGGT scored 6.15 out of 10 for its submission, which is slightly lower than last year. This score led to a financial reward of £1.48 million. There is more detail in our decision on this year's stakeholder engagement discretionary reward.<sup>29</sup>

## Connections

### Additional capacity

3.24. There was no requirement for additional network capacity at entry or exit points during 2015-16.

### UNC 373 obligations

3.25. NGGT has an output to meet the obligations in Uniform Network Code (UNC) modification 373 which sets out the process and timescales for connection to the NTS. There is no financial incentive related to this output.

3.26. NGGT received six connection applications during 2015-16. Connection offers were made to all applicants within the required timescales.

## Environmental

### Solutions to maintain compliance with emissions legislation

3.27. NGGT needs to ensure its compressor fleet is compliant with emissions legislation. This legislation includes the Industrial Emissions Directive (IED)<sup>30</sup> and the Integrated Pollution Prevention and Control Directive.

3.28. During 2015-16, two new compressor units at St Fergus and one new unit at Kirriemuir have achieved full operational acceptance. A further unit at Hatton became operational during the year but some noise/vibration issues need resolving before full operational acceptance is given.

3.29. NGGT also plans to complete the installation of catalysts to achieve compliance with the IED at Aylesbury during 2017.

#### *MPR parallel work*

3.30. In RIIO-T1 we allowed funding (approximately £140m in 2009/10 prices) for NGGT to install new compressors at Aylesbury, Huntingdon and Peterborough compressor stations to ensure compliance with the IED. We added the following output:

*Compressor replacement – changes for compliance with requirements of the IED.*

<sup>29</sup> [https://www.ofgem.gov.uk/system/files/docs/2016/10/stakeholder\\_engagement\\_15-16\\_decision\\_letter\\_tos.pdf](https://www.ofgem.gov.uk/system/files/docs/2016/10/stakeholder_engagement_15-16_decision_letter_tos.pdf)

<sup>30</sup> <http://ec.europa.eu/environment/industry/stationary/ied/legislation.htm>

3.31. We provided further details of the output in the initial proposals document:

*More specifically the outputs are set as follows:*

- *Appropriately sized electric Variable Speed Drives (VSD) in Peterborough and Huntingdon compressor stations, and*
- *Rendering Aylesbury compressor station compliant with the IED requirements, via the installation of an appropriately sized VSD and a compliant gas turbine.*

3.32. NGGT is delivering alternative solutions to those specified above and, in the case of Aylesbury, the costs are significantly lower than originally forecast.

3.33. We stated in our May 2016 MPR decision letter that we would clarify which output NGGT will be accountable for as part of our MPR parallel work.

3.34. In our MPR parallel consultation<sup>31</sup> published in February 2017 we stated our minded-to approach is to consider the output delivered if NGGT comply with the IED by implementing the option which delivers the greatest long-term value for money for consumers. Under this approach we would hold NGGT to account for identifying and deploying the right solution, regardless of what it is.

### **Business Carbon Footprint**

3.35. NGGT must report annually on the National Transmission System (NTS) business carbon footprint (BCF) to allow interested stakeholders to monitor its performance. There are no targets or financial incentives linked to this output.

3.36. The BCF measure includes:

- Scope 1 (assets): Direct greenhouse gas (GHG) emissions that occur from sources that are owned and controlled by the company (eg exhaust gas emissions from gas compressor units).
- Scope 2 (operation): Indirect GHG emissions (eg from the generation of purchased energy consumed by NGGT).
- Scope 3 (external): Other indirect GHG emissions that result from the activities of the company, but are not owned or controlled by the company (eg contractors carrying out business activities on behalf of the network).

3.37. Scope 1 emissions increased from 260,219 tCO<sub>2</sub>e<sup>32</sup> in 2014/15 to 356,245 tCO<sub>2</sub>e in 2015/16 mainly due to increases in natural gas fuel combustion. The driver of this was increased compressor running hours (ie more fuel was used to run gas turbines for compressor units). Changing supply and demand patterns and increasing gas supplies at St Fergus were cited by NGGT as central factors in the increased compressor running hours.

<sup>31</sup> <https://www.ofgem.gov.uk/network-regulation-riio-model/riio-mid-period-review-riio-t1-and-qd1>

<sup>32</sup> tonnes of carbon dioxide equivalent

3.38. Scope 2 emissions increased from 35,593 tCO<sub>2</sub>e in 2014/15 to 61,325 tCO<sub>2</sub>e in 2015/16, mainly due to an increased amount of electricity used by the compressor units which are powered by variable speed drives (VSD). This was due to an increase in running hours of the electric variable speed drive fleet. Again supply and demand behaviour and increased gas supplies were cited as the main factors.

3.39. Scope 3 emissions decreased from 747 tCO<sub>2</sub>e to 630 tCO<sub>2</sub>e from 2014/15 to 2015/16. The main driver of the decrease in Scope 3 emissions is the reduction of emissions from air travel from 650 tCO<sub>2</sub>e to 514 tCO<sub>2</sub>e.

**Table 9. Business carbon footprint (BCF) emissions (tCO<sub>2</sub>e)**

<b>Scope type</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>
Scope 1	321,346	260,219	356,245
Scope 2	28,253	35,593	61,325
Scope 3	627	747	630
<b>Total BCF</b>	<b>350,226</b>	<b>296,559</b>	<b>418,200</b>



## 4. Innovation

### Chapter Summary

This chapter explains NGGT's expenditure on the various innovation incentives in RIIO-T1.

### Overview

4.1. The RIIO price controls include incentives designed to encourage network licensees to innovate in the design, build and operation of their networks to facilitate the transition into a low carbon economy. The Network Innovation Allowance (NIA) and the Network Innovation Competition (NIC) are key elements of this.

4.2. 90% of NGGT's NIC and NIA expenditure is recoverable from consumers, with the other 10% coming from the licensee or other external parties.

4.3. As innovation projects are completed we expect the learning to be incorporated into the core part of network businesses. NGGT will not only be learning from its own projects, but we also expect companies to share learning with other network companies. This is partly facilitated by the Energy Network Association's (ENA's) Smarter Networks Portal<sup>33</sup>, which is publically accessible and provides information on the projects financed through the NIC and NIA.

4.4. We have recently consulted on proposed changes to the governance arrangements for the gas (and electricity) NIC and NIA which aim to deliver (among other things) greater value for money for consumers from innovation and to deliver operational improvements to the NIC and NIA schemes<sup>34</sup>. In the future we want:

- NGGT to explain, as part of the registration process, why its projects are eligible for NIA funding rather than simply stating that they are, and
- NGGT to provide information on the benefits of rolling out innovative solutions in to business as usual.

4.5. We will publish our decision in the coming months.

### Network Innovation Allowance

4.6. The NIA is an allowance that funds small innovation projects. NIA initiatives must have the potential to deliver financial benefits to customers and must comply with the NIA Governance Document<sup>35</sup> to be eligible for funding. Successful projects should aim to achieve one or more of the following:

- reduce safety risks and improve reliability of the network
- reduce the environmental impacts of the network
- facilitate new connections

<sup>33</sup> <http://www.smarternetworks.org/Index.aspx?Site=qt>

<sup>34</sup> [https://www.ofgem.gov.uk/system/files/docs/2016/12/innovation\\_review\\_consultation\\_final.pdf](https://www.ofgem.gov.uk/system/files/docs/2016/12/innovation_review_consultation_final.pdf)

<sup>35</sup> [https://www.ofgem.gov.uk/sites/default/files/docs/2015/04/gas\\_nia\\_v2\\_-\\_final\\_clean.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2015/04/gas_nia_v2_-_final_clean.pdf)

- develop new commercial frameworks
- strategically develop licensees' networks
- improve system operability
- enhance working processes.

4.7. NGGT is allowed to spend up to 0.7% (£4.7 million for 2015/16) of annual base revenue on NIA projects. Table 10 below provides a summary of the number of NIA projects undertaken by NGGT, how much it spent on NIA projects and the percentage of its NIA allowance used since the start of RIIO-T1.

**Table 10: NGGT NIA activity**

	2013-2014	2014-15	2015-16
NIA Expenditure (£m)	3.1	4.0	3.4
Percentage of allowance used	70%	85%	72%
Number of projects	52	47	44

4.8. NGGT spent £3.4 million on NIA projects during 2015-16. Spending on the 44 NIA projects undertaken by NGGT in 2015-16 ranged from approximately £100k to £300k. In 2015-16, NGGT has continued with, and implemented new projects across areas such as safety, environment, reliability, system operability, commercial and strategy.

4.9. Examples of NGGT's NIA projects<sup>36</sup> include:

- Next Generation Predictive Emission Monitoring Validation (PEMS)<sup>37</sup>. This project predicts emissions levels using pre-installed plant operating parameters. These will be fitted in gas turbines to assess emissions. The project should achieve cost savings of £490k for customers.
- Asset Information Models (AIM)<sup>38</sup> for component/pattern recognition. This project logs precise location, operational data, information about work carried out and existing condition of the National Transmission System (NTS). This project is forecast to produce cost savings of £1.8m for customers if applied to 10% of sites.

4.10. Details of individual projects are on the Energy Networks Association Smarter Networks website<sup>39</sup>.

## Network Innovation Competition

4.11. The NIC encourages network licensees (distribution and transmission) to innovate in the design, build, development and operation of their networks. NIC projects should ultimately lower costs for the consumer and assist with GB's decarbonisation. As part of the annual competition, gas distribution and transmission companies compete for a portion of up to £18 million to funding to a small number of large-scale innovation projects as part of the annual competition.

<sup>36</sup> <http://www2.nationalgrid.com/UK/Our-company/Innovation/Gas-transmission-innovation/NIA-Projects/>

<sup>37</sup> [http://www.smarternetworks.org/NIA\\_PEA\\_PDF/NIA\\_NGGT0074\\_1305.pdf](http://www.smarternetworks.org/NIA_PEA_PDF/NIA_NGGT0074_1305.pdf)

<sup>38</sup> <http://www.smarternetworks.org/Project.aspx?ProjectID=1892>

<sup>39</sup> <http://www.smarternetworks.org/Index.aspx?Site=qt>

4.12. NGGT has commenced two NIC projects (Project GRAID and Project CLoCC), which were allocated funding in the 2014-15 NIC and 2015-16 NIC respectively.

**Project GRAID** (Gas Robotic Agile Inspection Device) will develop a robotic platform that can enter buried pipework at high-pressure installations that currently can't be reached by Pipeline Inspection Gauges (PIGs). It will allow the condition of complex pipework to be inspected remotely, avoiding the need for intricate excavations.

**NIC Funding Awarded in 2014-15 of £5.7m**  
**Total project costs: £6.5m**  
**2015-16 spend: £1.9m**  
**Completion date: 2018**

**Expected benefits**

**Cost savings of £60m over 20 years**  
**Carbon savings of more than 2,000 tonnes over next 20 years**

**Project CLoCC** (Customer Low Cost Connections) will minimise the time and cost of connections to the NTS in scenarios where unconventional gas will come onto the NTS. It will do this by using optimised commercial processes to meet the requirements of non-traditional customers, using innovative physical connection solutions for unconventional gas connections at high pressure and applying a web-based connection platform for new connections.

**NIC Funding Awarded in 2015-16 of £4.8m**  
**Total project costs: £5.4m**  
**2015-16 spend: £100k**  
**Completion date: 2018**

**Expected benefits**

**Financial benefits of £100m in next 20 years, based on 100 new connections in this period.**  
**Cost of each connection reduced by 50%.**

## 5. Transmission Owner (TO) costs

### Chapter Summary

This chapter evaluates NGGT's actual and forecast TO costs against the costs allowed in RIIO-T1, taking into account actual and forecast workloads. It looks at the various cost categories (including uncertainty mechanisms) and activities which make up total expenditure (totex).

### Overview

5.1. NGGT's total forecast expenditure allowance (totex) during the RIIO-T1 period is £2.2 billion<sup>40</sup>. This total allowance enables it to deliver the outputs set out in Chapter 3. NGGT's annual reported totex is used to set its future allowed revenue with any out/underperformance adjusted after a two year lag. Allowed revenue (and customer bill impact) are discussed in Chapter 2 whereas this chapter focuses on NGGT's performance against its allowed costs.

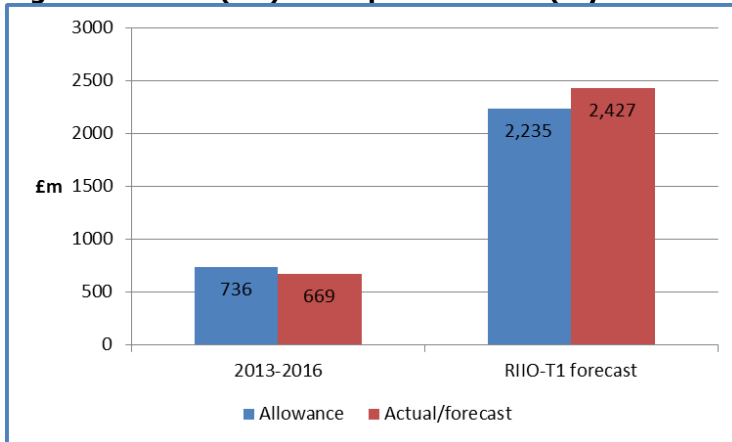
5.2. NGGT is incentivised to outperform its totex allowance via the totex incentive mechanism. Under this mechanism NGGT keeps 44.36% of any underspend and the remaining underspend (subject to tax) is returned to customers (this is dependent on the gas shippers passing the savings on to customers). This mechanism is symmetrical which means that customers would face additional costs in the event of NGGT overspending against its totex allowance.

5.3. Figure 3 shows NGGT's performance over the first three years of RIIO-T1, as well as its forecast for the RIIO-T1 period. This shows that NGGT is currently underspending by 9.0%, but is forecasting to overspend by 8.6% over RIIO-T1. If NGGT overspends as forecast, consumers will face additional costs through the totex incentive mechanism as described in the previous paragraph.

---

<sup>40</sup> Includes NGGT's forecast allowances and excludes Avonmouth pipeline allowance following MPR decision; £0.2 billion we allowed for enhanced physical security at the 2015 uncertainty mechanism; and £0.2 billion in further allowances NGGT forecast they will need to replace the Feeder 9 Humber crossing pipeline. The application window to fund this project is in May 2018. We will assess NGGT's application and make a decision on whether to allow additional funding later that year.

**Figure 3: NGGT (TO) totex performance (3 year and RIIO-T1 forecast)**



5.4. NGGT had forecast a slight underspend of £9 million (0.4%) in its July 2016 submission. However, following our recent MPR decision to remove £203 million<sup>41</sup> from NGGT’s allowances for the Avonmouth pipelines output, NGGT’s forecast now shows an overspend of 9% on its totex allowance.

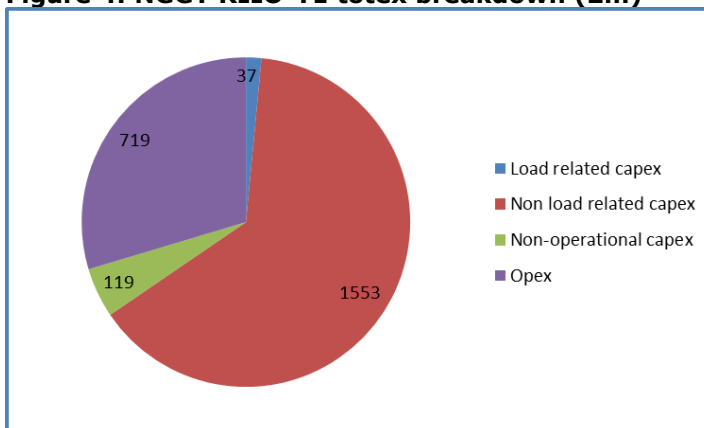
### Cost breakdown

5.5. NGGT’s costs are broken down into the following categories:

- Load related capital expenditure (capex)
- Non load related capex
- Non-operational capex
- Operating costs (opex).

5.6. Figure 4 shows NGGT’s expenditure in each category over the RIIO-T1 period. The highest costs are for non load related capex which are driven mainly by compressor emissions costs and asset health costs.

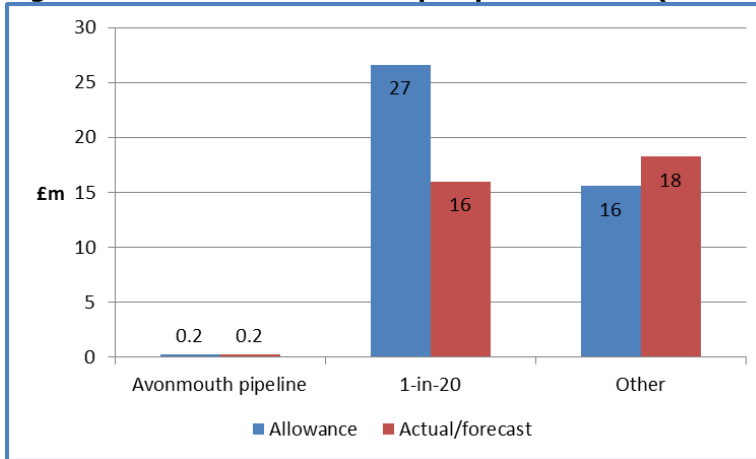
**Figure 4: NGGT RIIO-T1 totex breakdown (£m)**



<sup>41</sup> MPR documents refer to this figure as £168.8m in 2009/10 prices.

## Load related capex

**Figure 5: NGGT load related capex performance (RIIO-T1 forecast)**



5.7. We allowed NGGT £42 million<sup>42</sup> for RIIO-T1 load related capex work at final proposals. This work mainly relates to the reliability and safety output areas. The main area of spend was on network capability projects to maintain the 1-in-20 obligation in Scotland. NGGT is forecasting a significant underspend in this area.

### *1-in-20 obligation in Scotland*

5.8. We allowed NGGT funding of £27 million to maintain the 1-in-20 obligation in Scotland. This involved projects at strategic locations within the NTS, such as reverse flow modifications at compressor sites. These projects were aimed at reversing flows of natural gas towards Scotland in order to replace declining volumes of UK continental shelf (UKCS) gas in case of 1-in-20 demand scenarios<sup>43</sup>.

5.9. NGGT has deferred expenditure in this area while it reviews the possible solutions. NGGT forecasts it will need to begin incurring costs in this area in 2017-18 to ensure it will continue to meet this obligation.

### *Avonmouth*

5.10. We allowed funding of £203.2m at final proposals to build the Avonmouth pipeline solution. NGGT has now reassessed its options regarding the closure of the Avonmouth LNG site.

5.11. In our MPR decision we confirmed we would remove the output and funding of £202.9 million for the pipeline solution. We have allowed £0.2m of costs which NGGT has incurred in assessing its technical and strategic options.

<sup>42</sup> This figure is following our MPR decision to remove NGGT's Avonmouth allowance.

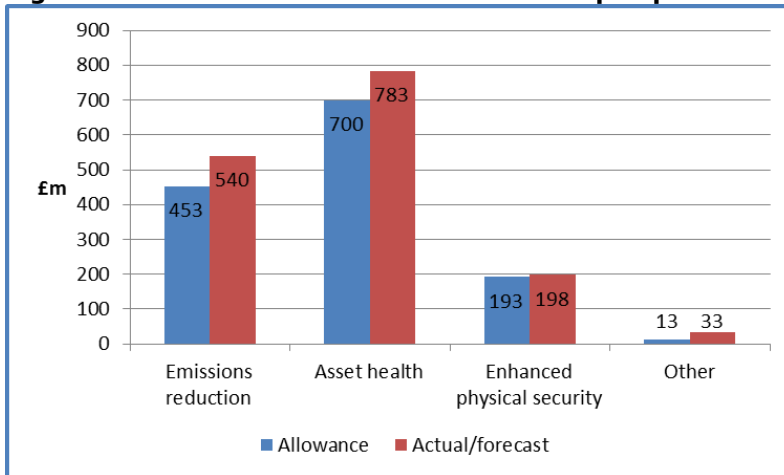
<sup>43</sup> See Chapter 3 for further detail

## Non load related capex

5.12. Non load related capex mainly comprises costs relating to:

- compressor emissions reduction (environmental output area)
- maintaining or improving asset health (reliability and safety outputs areas)
- enhanced physical security costs.

**Figure 6: NGGT RIIO-T1 non load related capex performance (RIIO-T1 forecast)**



5.13. NGGT received £1,202 million for its RIIO-T1 non load related capex allowance and has forecast a further £156 million allowance is required for its Feeder 9 project. It forecasts to overspend by £195m during RIIO-T1. This is mainly driven by increased compressor emissions costs and asset health costs.

### Compressor emissions reduction

5.14. NGGT is carrying out work to ensure its compressor fleet is compliant with emissions legislation. This legislation includes the Industrial Emissions Directive (IED) and the Industrial Pollution Prevention and Control Directive.

5.15. NGGT is forecasting an overspend of £87 million during RIIO-T1 against an allowance of £453 million. This is partly due to the way the allowances were set at final proposals where the emissions allowance was split between capex and opex (£67 million (2009-10 prices) was included in NGGT’s opex allowance). NGGT has also incurred some additional costs (such as new station control buildings) which would not be included within a typical compressor unit build.

### Industrial emissions directive (IED)

The IED was transposed into UK law in 2013. It places requirements on operators of combustion plants (including NGGT) to meet emissions limits for Carbon Monoxide and Nitrogen Oxides.

In its RIIO business plan NGGT forecast that a minimum of **21** compressor units (almost a third of its fleet) would be classed as being non-compliant with this legislation.

For plants which cannot comply with the emissions legislation NGGT has the following options:

- Operate for **500 hrs** per yr (emergency use derogation), or
- Operate for **17,500** hours or until 2023 (whichever is sooner) before ceasing operations.

5.16. We also note that:

- NGGT's forecast (average of ~£90 million per year) in relation to compressor emissions reductions is much higher than its previous spend during RIIO-T1 (average of ~£30 million).
- NGGT is currently underspending against allowances by approximately £25 million (22%) for the first three years of RIIO-T1.
- Almost £50 million of costs incurred so far relate to projects which were funded in a previous price control.

#### *Asset health*

5.17. NGGT forecasts allowances of £700 million (£544 million for baseline asset health work and a further £156 million of allowances needed for the Feeder 9 Humber pipeline replacement project).

5.18. NGGT has underspent by £19 million (9%) during the first three years of RIIO-T1. NGGT states that it has increased its asset health delivery during 2015-16 following the monitoring work carried out during the first two years of RIIO-T1. Over the course of RIIO-T1, NGGT is forecasting an overspend of £83 million against its baseline allowance. The key reasons for this forecast overspend are:

- Increased number of asset issues identified since the start of RIIO-T1. This is due to increased monitoring activity rather than a sudden deterioration of the assets.
- Significant asset health works at Bacton.

### **Non-operational capex**

5.19. Non-operational capex is expenditure on non-network assets. This mainly includes expenditure on information technology but also includes costs incurred for land and buildings, vehicles, tools and equipment.

5.20. NGGT is forecasting to overspend in this area by £53 million against an allowance of £66 million. As the actual network condition is lower than was previously modelled at the beginning of RIIO-T1, there is an increased requirement for spend on projects associated with the management of asset health and implementing the new Network Output Measures (NOMs) methodology. This has led to the forecast overspend in this area.

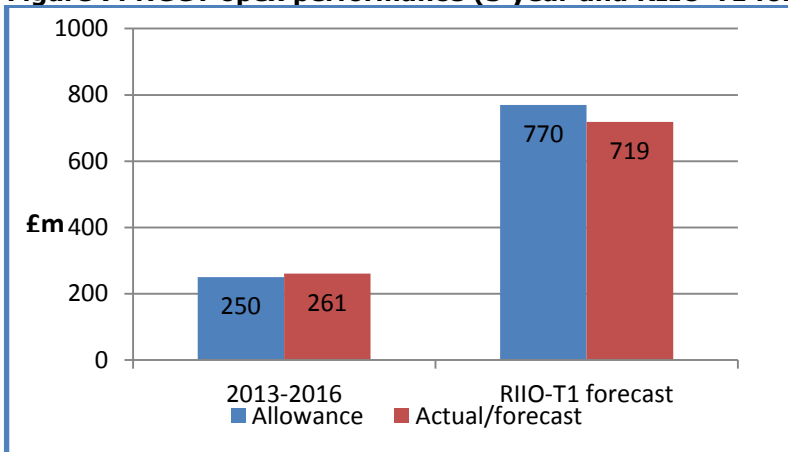
5.21. These projects will aim to improve the quality and detail of asset condition and performance data held.

### **Opex**

5.22. Operating expenditure (opex) refers to the costs incurred in the day-to-day operation of the network. This covers a range of costs such as those incurred inspecting and maintain pipelines, to those incurred for business support costs (eg IT, telecoms or insurance costs).



**Figure 7: NGGT opex performance (3 year and RIIO-T1 forecast)**



5.23. NGGT is currently overspending for the first three years of RIIO-T1. This is mainly due to increased business support costs although its direct opex costs (eg inspections and maintenance of assets) are lower than allowances.

5.24. NGGT is forecasting to underspend by around 7% on opex costs during RIIO-T1. This is mainly as a result of efficiencies gained by implementing changes as part of NGGT’s new UK operating model. It should also be noted that NGGT’s allowance includes some emissions costs as explained in paragraph 5.15.

## 6. System Operator (SO) costs

### Chapter Summary

This chapter discusses NGGT’s performance as the NTS system operator.

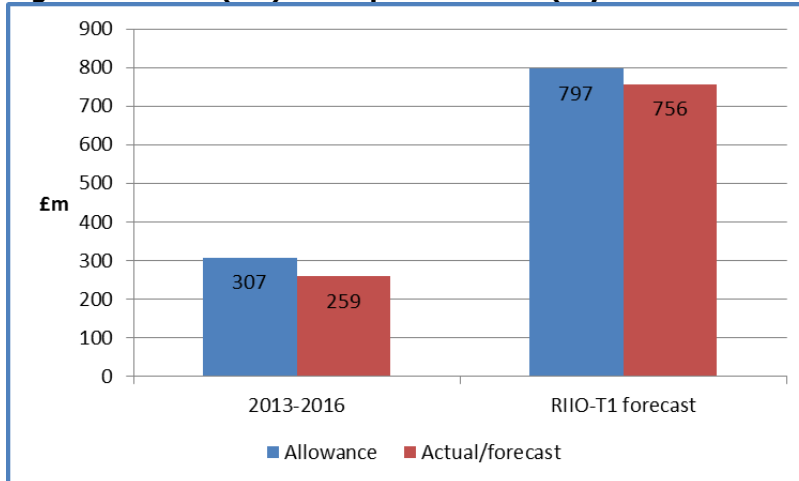
### Overview

6.1. NGGT is the gas transmission System Operator (SO) responsible for balancing the high pressure gas NTS on a continuous basis across Great Britain. It has responsibility for the residual balancing activities on the NTS and its transportation licence requires it to act in an efficient, economic and co-ordinated manner in performing its role.

6.2. In order to fulfil its role, NGGT buys and sells gas and procures associated services. As SO, NGGT undertakes the physical management of the NTS using compressors and Operating Margin (OM) gas to maintain safe pressure on the system. It also provides information to market participants such as demand forecasts.

6.3. The costs of these actions are recovered via charges to market participants and are ultimately borne by consumers.

**Figure 8: NGGT (SO) totex performance (3 year and RIIO-T1)**



### Totex performance

6.4. NGGT forecast expenditure of £756m against an allowance of £797m for RIIO-T1 (an underspend of 5%).

6.5. The main reasons given for the forecast underspend is due to underspending against Xoserve allowances and lower spend on telemetry systems.<sup>44</sup>

<sup>44</sup> Telemetry systems monitor gas flows and allow information to be transmitted from operational sites.

## Uncertain costs – cyber security and data centres

6.6. NGGT has indicated it will apply for further funding of just over £50m in relation to cyber security and data centres at the 2018 reopener window. These costs are included within its forecast costs and allowances.

6.7. The increased spend on cyber security is due to the changing threat which has led to an increased need to identify potential cyber activity and to detect and respond to cyber attacks. There has also been a need to review the security standards in place for some of NGGT's key operational cyber assets.

6.8. NGGT has also stated that it intends to continue with its proposal to replace its current data centres with new purpose-built data centres.

## Appendices

---

**Appendix 1 – Further detail on financial data**

**Appendix 2 – Glossary for financial terms**

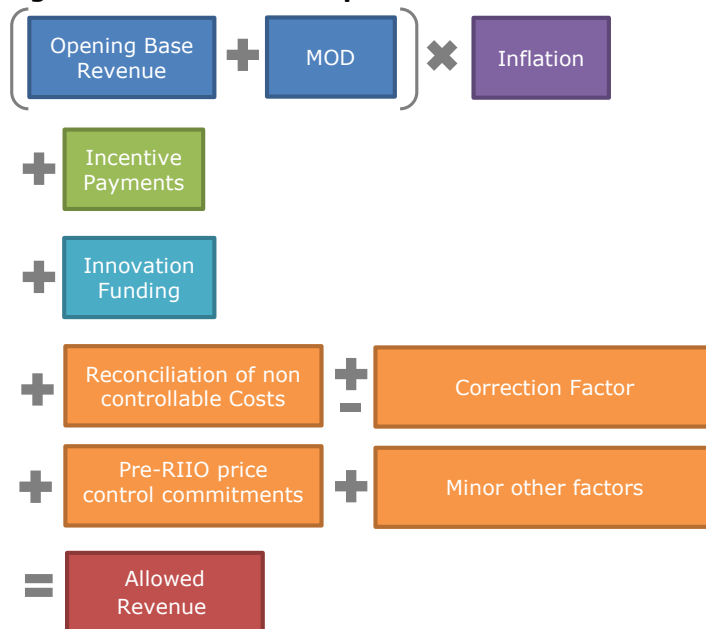
**Appendix 3 – Data file**

# Appendix 1: Determining allowed revenue

## Allowed revenue and MOD

Allowed revenue is the amount of money that a network company can earn on its regulated business.<sup>45</sup> Figure A1.1 sets out at high-level, how we determine the allowed revenue in any given year of the price control.

**Figure A1.1: Constituent parts of allowed revenue**



Of all constituent parts of allowed revenue, Opening Base Revenue comprises the significant majority. Opening Base Revenue is a best view of the amount of money a network company needs to earn on its regulated business to recover the efficient cost of carrying out its core activities. It is determined through ex ante forecasts conducted by Ofgem and the licensee.

Opening Base Revenue is modified annually during the price control by the “MOD” term from the licences. This takes place as part of our Annual Iteration Process (AIP). The AIP process takes account of uncontrollable market uncertainties as they become known, such as the cost of debt and changes to taxation rules. It also measures financial performance against pre-determined output incentives. Where a

<sup>45</sup> Due to the timing of receiving actual expenditure data and that customer tariffs are set in advance of regulatory years totex spending assessments only begin to impact Allowed Revenue with a minimum two year lag. Therefore, totex performance in 2015-16 will first impact Allowed Revenue in 2017-18. Detailed calculations are contained in the Price Control Financial Model (PCFM), which is available on our website: <https://www.ofgem.gov.uk/network-regulation-riio-model/price-controls-financial-model-pcfm>

company under / over performs relative to the ex-ante expectation a percentage of the difference is shared with consumers through the MOD.

The MOD term is the difference between the updated Base Revenue (recalculated using the latest available performance data, including revisions to that data for previous years) and the Opening Base Revenue. Two key variables to the MOD value are Totex performance and Regulatory Asset Value (RAV), discussed below.

Allowed revenue is also adjusted for outputs incentive payments, innovation funding and other costs such as differences between previous years' allowed revenue and the actual amount that has been collected. True up of non controllable costs, and the correction factor are explained in the main body of the report (Table ).

The remaining items included in Base Revenue are an allowance for taxation, legacy factors, pension deficits, equity issuance costs, costs that cannot be controlled and other minor adjustments.

The first AIP (concluded 30th November 2013) revised Base Revenue for 2014-15. That MOD to Base Revenue was recalculated using updated legacy values from the previous TPCR4 roll-over price control and a lower Cost of Debt from our trailing average index, but it was too early to include any RIIO-T1 (Gas) Totex performance data.<sup>46</sup> MOD is not applicable to Base Revenue for regulatory year 2013-14. Table A1.1 displays MOD from all AIPs to date, uplifted to 2015-16 prices.

**Table A1.1: MOD values**

£m	2015-16	2013-14	2014-15	2015-16	2016-17	2017-18
<b>NGGT TO</b>	-		9	12	13	7
<b>NGGT SO</b>	-		-1	-17	1	4

Across these AIPs to date total Base Revenue collected has increased by £28m relative to the forecast at Final Proposals.

## Allowed totex and other factors that impact Base Revenue

The difference between actual totex and allowed totex (whether the actual totex is an underspend or overspend) is shared between the company (via modifying to Base Revenue) and with consumers and tax obligations. This process forms the TIM (explained in Chapter 2). To change company Base Revenue there is a revision to Allowed Totex that takes into account the sharing. As illustrated in Figure A3.2, this revised Allowed Totex is used in place of the original value. The revised Allowed

<sup>46</sup> The cost of debt allowance changes the WACC value. The cost of debt allowance itself is derived from the average of two indices (with serial numbers DE000A0JY811 and DE000A0JZAF5 as provided by IHS Markit) that report historic borrowing costs for GB non-financial "A" and "BBB" rated bonds. A 10 year rolling average of these costs is determined. The average currently includes periods that predate the 2008 financial crisis, during which time borrowing costs were greater than they are today (borrowing costs that are newly entering the calculation period are lower than these older costs that are exiting it).

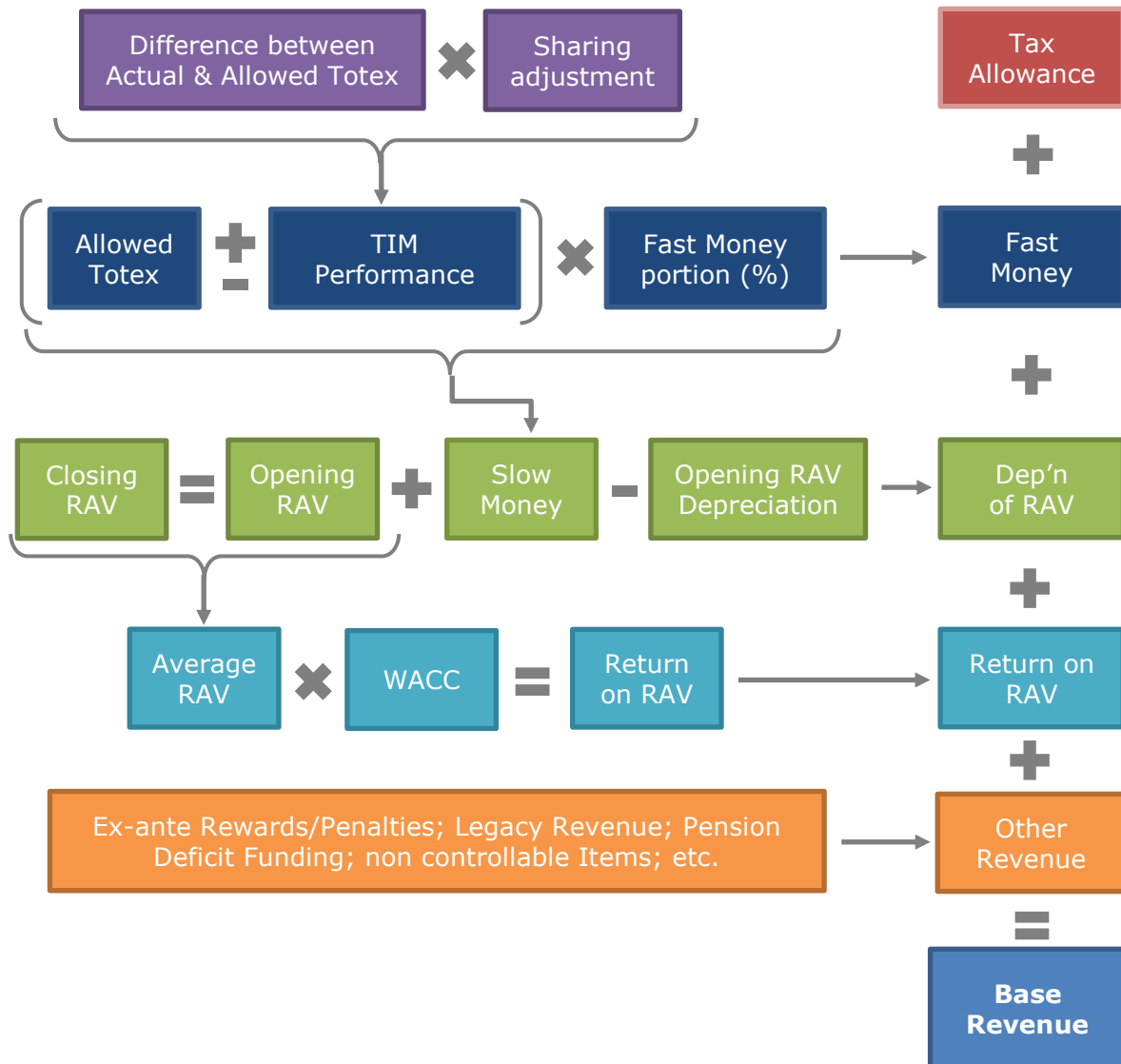
Totex and the calculations that follow (described below) revise the Base Revenue that the company is allowed to recover as part of its overall Allowed Revenue.

For Base Revenue calculations a portion of Allowed Totex is directly added to the Base Revenue (this is known as Fast Money as the company is allowed to collect revenue equal to this value during the next Allowed Revenue year).

The remainder of allowed totex (known as Slow Money) is added to the opening Regulatory Asset Value (RAV). RAV is the long-term financial value of the capital employed in the regulated business

RAV is based on the initial market value of the regulated asset base at privatisation, plus all subsequent additions. In accordance with established regulatory methods, RAV is gradually reflected in Base Revenue over multiple decades, reflecting the average lifetime of network assets. Amounts are deducted annually from opening RAV (this is depreciation). The depreciation value is then added to Base Revenue in the next Allowed Revenue year. The average of opening and closing RAV for the year also earns a return (at the Weighted Average Cost of Capital (WACC)).

**Figure A1.2: Determination of Base Revenue**





As TIM performance becomes known, the RAV is recalculated using the updated Slow Money value. The latest view of RAV positions are shown in Table A1.2.

**Table A1.2: RAV Balance**

<b>£m 2015-16 Prices</b>	<b>NGGT (TO)</b>	<b>NGGT (SO)</b>
<b>Total RAV at 1st April 2013</b>	<b>5,485</b>	<b>64</b>
RAV at 1st April 2013	4,827	64
Transfer from Shadow RAV to RAV <sup>47</sup>	291	-
RAV Slow Money	558	101
RAV Depreciation	-509	-50
RAV at 31st March 2016	5,168	115
Shadow RAV <sup>48</sup> at 1st April 2013 <sup>49</sup>	658	-
Transfer from Shadow RAV to RAV	-291	-
Shadow RAV Slow Money	132	-
Shadow RAV Depreciation	-28	-
<b>Shadow RAV at 31st March 2016</b>	<b>471</b>	<b>-</b>
<b>Total RAV at 31st March 2016</b>	<b>5,638</b>	<b>115</b>

The total RAV of the licensee has been increasing during the price control. Spending is rewarding NGGT with slow money (which is added to the RAVs) at a rate that exceeds the rate of depreciation of incumbent assets. Unlike the electricity network transmission and distribution sectors, from the start of RIIO the gas transmission sector already treated RAV as depreciating over 45 years, the rate of depreciation is not changing for this sector. The rate of RAV growth is currently greater for non-core RAV than normal RAV.

## Recalculated Base Revenue

We recalculate Base Revenue taking into account items in Figure A1.1.

Figure A1.3 shows the constituent parts of recalculated Base Revenue (stacked blue bars). The black lines are Opening Base Revenue.

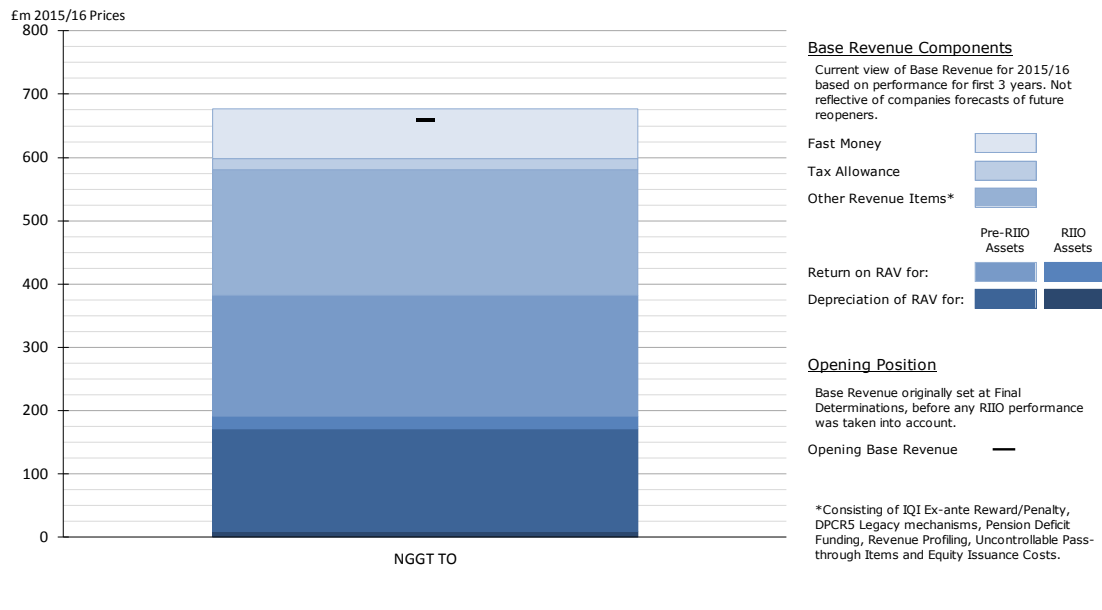
<sup>47</sup> Includes a true up between the PCFM (where transfer values are as forecast at Final Proposals) and actual expenditure. This true up will only be reconciled in the PCFM at the end of the price control.

<sup>48</sup> Where investments are initially funded outside of the core RIIO-T1 price control with a different allowed rate of return (WACC and depreciation) than set at Final Proposals the costs are held outside of the main RAV in a "Shadow RAV". Once the normal allowed rate of return becomes applicable to the investments then the remaining Shadow RAV is transferred to the main RAV.

<sup>49</sup> A large portion of non-core RAV is associated with the NGGT capacity obligation at Fleetwood, whose treatment under RIIO-T1 (Gas) is under review. For more detail see:

<https://www.ofgem.gov.uk/publications-and-updates/review-treatment-nggt-s-capacity-obligation-fleetwood-under-riio-t1-price-controls>

**Figure A1.3: Recalculated Base Revenue using actual performance data up to 2015-16**



Return on RAV and its depreciation of pre-RIIO assets continue to comprise c.50% of all of Base Revenue. This share is expected to decrease with successive years, meanwhile the returns from RIIO-T1 investments will increase in share.

## Appendix 2: Glossary for financial terms

---

**Allowed revenue**

The amount of money that a network company can earn on its regulated business.

**Capital expenditure (capex)**

Expenditure on investment in long-lived network assets, such as gas pipelines or electricity overhead lines.

**Capitalisation policy**

The approach that the regulator follows in deciding the percentage of total expenditure added to the RAV (and thus remunerated over time) and the percentage of expenditure remunerated in the year it is incurred.

**Cost of debt**

The effective interest rate that a company pays on its current debt. Ofgem calculates the cost of debt on a pre-tax basis.

**Cost of equity**

The rate of return on investment that is required by a company's shareholders. The return consists both of dividend and capital gains. Ofgem calculates the cost of equity on a post-tax basis.

**Opening Base Revenue**

The best view at the start of the price control on the amount of money a network company needs to earn on its regulated business to recover the efficient cost of carrying out its core activities.

**Operating Expenditure (Opex)**

Expenditure on the day to day operation of a network such as staff costs, repairs and maintenance, and overheads.

**Regulatory Asset Value (RAV)**

A financial balance representing expenditure by the licensee which has been capitalised under regulatory rules. The licensee receives a return and depreciation on its RAV in its price control allowed revenues.

**Return on Regulatory Equity (RoRE)**

The financial return achieved by shareholders in a licensee during a price control period from its out-turn performance under the price control.

**Sharing Factor** – It represents the percentage that the licensee bears in respect of an overspend against allowances or retains in respect of an underspend against allowances.

**Total expenditure (totex)**

Totex consists of all the expenditure relating to a licensee's regulated activities with some specified exceptions. See the RIGs for a list of these exceptions.<sup>50</sup>

---

<sup>50</sup> <https://www.ofgem.gov.uk/publications-and-updates/direction-make-modifications-gas-transmission->

**Weighted Average Cost of Capital (WACC)**

The Weighted Average Cost of Capital is Ofgem's preferred way of expressing the rate of return allowed on the Regulatory Asset Values (RAV) of price controlled network companies.

## Appendix 3: Data file

---

The spreadsheet in the below link contains the data for all tables and graphs shown within this annual report.

<https://www.ofgem.gov.uk/publications-and-updates/riio-gas-transmission-annual-report-2015-16>